


HENRY F. HOUSKEEPER

Assistant Scientist I

Applied Ocean Physics & Engineering
Woods Hole Oceanographic Institution

office: Bigelow 202 (MS#11)
email: henry.houskeeper@whoi.edu

EDUCATION

2014 – 2020	Ph.D. <i>Advances in bio-optics for observing aquatic ecosystems</i>  Ocean Sciences Advisor: Raphael Kudela	University of California, Santa Cruz
2008 – 2012	B.S. Major in Biology, Minor in Literature	University of California, Santa Cruz

SELECTED PROFESSIONAL EXPERIENCE

2024-Present	Assistant Scientist I Presently developing a field capability to support <i>in situ</i> UV sensing of aquatic optical properties. Recent activities include completing an analysis of the effects of colored dissolved organic matter (CDOM) on spectral variability (Houskeeper & Hooker 2025 <i>Biogeosci.</i>), contributing to collaborative research on phytoplankton remote sensing in ice-adjacent waters (Oliver et al., 2025 <i>Limn. & Ocea. Lett.</i>), continuing on-going collaborations for global (Tom Bell, AOPE) plus African (Albertus Smit, Univ. Western Cape) kelp forest dynamics, and forming a new collaboration characterizing optical properties of calcium carbonate storm resuspensions (Jim Acker, NASA and Catherine Mitchell, Bigelow Laboratory).	Woods Hole Oceanographic Institution
2023-2024	Postdoctoral Scholar: Weston Howland Jr. Award Extended a Landsat historical kelp forest map towards global coverage (Bell et al. 2023 <i>PLOS One</i>). Conducted a field expedition in South Africa. Produced initial estimates for oceanic short-wave infrared apparent optical properties (Houskeeper et al. 2023 <i>PNAS Nexus</i>). Developed an optical sensor concept with fourteen decades of dynamic range (Houskeeper et al. 2024 <i>JAOT</i>).	Woods Hole Oceanographic Institution
2020-2023	Postdoctoral Scholar: NASA Floating Forests Project Developed automated image processing algorithms for classifying kelp forest canopy in satellite imagery (<i>PLOS One</i> 2022). Leveraged image processing tools to study kelp forest ecology in understudied regions. Developed artificial intelligence models to improve satellite kelp monitoring. Generated remote sensing algorithms for geostationary platforms (Houskeeper et al. 2022 <i>Appl. Opt.</i>).	University of California, Los Angeles
2021	Lecturer: Department of Geography Provided lectures and developed lab assignments and exams. Course topic: Earth system processes, including circulation patterns and structure of Earth's oceans and atmosphere. Enrollment: 96.	University of California, Los Angeles

SCIENTIFIC PUBLICATIONS (PEER-REVIEWED)

* Led by Mentored Student

Houskeeper H.F. and S.B. Hooker. "The primacy of colored dissolved organic matter to aquatic light variability." *Biogeosciences* (Accepted 2025).

Oliver, H., J. Turner, A. Castagna, H.F. Houskeeper, and H. Dierssen. "High Antarctic coastal productivity in polynyas revealed by considering remote sensing ice-adjacency effects." *Limnology and Oceanography Letters* (Accepted 2025).

Arafeh-Dalmau, N., J.C. Villaseñor-Derbez, D. Schoeman, A. Mora-Soto, T.W. Bell, C. Butler, M. Costa, L. Dunga, **H.F. Houskeeper**, C. Lagger, C. Pantano, D. Lainez del Pozo, K.J. Sink, J. Sletten, T. Vincent, F. Micheli, and Ky.C. Cavanaugh. "Intensifying marine heatwaves and limited protection threaten global kelp forests." *Nature Communications* 16, no. 3173 (April 2025). <https://doi.org/10.1038/s41467-025-58054-4>

Gonzalez-Aragon, D., R. Muñoz, **H.F. Houskeeper**, Ky.C. Cavanaugh, W. García-Tuñón, L. Farias, C. Lara, and B. Broitman. "Seasonal and inter-annual dynamics of a *Macrocystis pyrifera* forest in Concepcion Bay, Chile." *Ecological Informatics* 87, no. 103013 (March 2025). <https://doi.org/10.1016/j.ecoinf.2025.103103>

Houskeeper, H.F., S.B. Hooker, and R.N. Lind. "Expanded linear responsivity for Earth and planetary radiometry." *Journal of Atmospheric and Oceanic Technology* 41, no. 11 (November 2024): 1093-1105. <https://doi.org/10.1175/JTECH-D-23-0133.1>

Kudela, R.M., S.B. Hooker, L.S. Guild, **H.F. Houskeeper**, and N. Taylor. "Expanded signal to noise ratio estimates for validating next-generation satellite sensors in oceanic, coastal, and inland waters." Special Issue, *Optical Remote Sensing of the Atmosphere and Oceans in Remote Sensing* 16, (March 2024): 1238. <https://doi.org/10.3390/rs16071238>

Houskeeper, H.F., and S.B. Hooker. "Extending aquatic spectral information with the first radiometric IR-B observations." *PNAS Nexus* 2, no. 11 (October 2023): pgad340. <https://doi.org/10.1093/pnasnexus/pgad340>

Bell, T.W., Ky.C. Cavanaugh, V.R. Saccomanno, Ka.C. Cavanaugh, **H.F. Houskeeper**, N. Eddy, F. Shuetzenmeister, N. Rindlaub, and M. Gleason. "Kelpwatch: A visualization and analysis tool to explore kelp canopy dynamics reveals variable response to and recovery from marine heatwaves." *PLoS One* 18, no. 3 (March 2023): e0271477. <https://doi.org/10.1371/journal.pone.0271477>

Marquez, L., E. Fragkopoulou, Ky.C. Cavanaugh, **H.F. Houskeeper**, and J. Assis. "Artificial intelligence convolutional neural networks map giant kelp forests from satellite imagery." *Scientific Reports* 12, no. 22196 (December 2022). <https://doi.org/10.1038/s41598-022-26439-w>

Houskeeper, H.F., S.B. Hooker, and Ky.C. Cavanaugh. "Spectrally simplified approach for leveraging legacy geostationary oceanic observations." *Applied Optics* 61, no. 27 (September 2022): 7966-7977. <https://doi.org/10.1364/AO.465491>

Hooker, S.B., **H.F. Houskeeper**, R.M. Kudela, K. Suzuki, and R.N. Lind. "Verification and validation of hybridspectral radiometry obtained from an unmanned surface vessel (USV) in the open and coastal oceans." Special Issue, *Recent Advances in Ocean Physics, Geochemistry and Biology from Unmanned Marine Vehicles in Remote Sensing* 14, no. 5 (February 2022): 1084. <https://doi.org/10.3390/rs14051084>

Houskeeper, H.F., I.S. Rosenthal, Ka.C. Cavanaugh, C. Pawlak, L. Trouille, J.E.K. Byrnes, T.W. Bell, and Ky.C. Cavanaugh. "Variability of giant kelp in the Islas Malvinas or Falkland Islands based on historical satellite imagery" *PLoS One* 17, no. 1 (January 2022): e0257933. <https://doi.org/10.1371/journal.pone.0257933>

Hooker, S.B., **H.F. Houskeeper**, R.N. Lind, and K. Suzuki. "One- and two-band sensors and algorithms to derive $a_{CDOM}(440)$ from global above- and in-water optical observations." *Sensors* 21, no. 16 (July 2021): 5384. <https://doi.org/10.3390/s21165384>

Hooker, S.B., **H.F. Houskeeper**, R.M. Kudela, A. Matsuoka, K. Suzuki, and T. Isada. "Spectral modes of radiometric measurements in optically complex waters." *Continental Shelf Research* 219 (April 2021): 104357. <https://doi.org/10.1016/j.csr.2021.104357>

McPherson, M.L., D.J.I. Finger, **H.F. Houskeeper**, T.W. Bell, M.R. Carr, L. Rogers-Bennett, and R.M. Kudela. "Large-scale shift in the structure of a kelp forest ecosystem co-occurs with an epizootic and marine heatwave." *Communications Biology* 4, no. 1 (March 2021): 298. <https://doi.org/10.1038/s42003-021-01827-6>

*Finger, D.J.I., M.L. McPherson, **H.F. Houskeeper**, and R.M. Kudela. "Mapping bull kelp canopy in northern California using Landsat to enable long-term monitoring." *Remote Sensing of Environment* 254 (March 2021): 112243. <https://doi.org/10.1016/j.rse.2020.112243>

Houskeeper, H.F., S.B. Hooker, and R.M. Kudela. "Spectral range within global $a_{CDOM}(440)$ algorithms for oceanic, coastal, and inland waters with application to airborne measurements." *Remote Sensing of Environment* 253C (February 2021): 112155. <https://doi.org/10.1016/j.rse.2020.112155>.

Guild, L.S., R.M. Kudela, S.B. Hooker, S.L. Palacios, and **H.F. Houskeeper**. "Airborne radiometry for calibration, validation, and research in oceanic, coastal, and inland waters." *Frontiers in Environmental Science* 8, no. 585529 (November 2020): 209. <https://doi.org/10.3389/fenvs.2020.585529>.

Houskeeper, H.F., D. Draper, R.M. Kudela, and E. Boss. "Chlorophyll absorption and phytoplankton size information inferred from hyperspectral particulate beam-attenuation." *Applied Optics* 59, no. 22 (August 2020): 6765-6773. <https://doi.org/10.1364/AO.396832>.

Hooker, S.B., A. Matsuoka, R.M. Kudela, Y. Yamashita, K. Suzuki, and **H.F. Houskeeper**. "A global end-member approach to derive $a_{CDOM}(440)$ from near-surface optical measurements." *Biogeosciences* 17, no. 2 (January 2020): 475-497. <https://doi.org/10.5194/bg-17-475-2020>.

Houskeeper, H.F. and R.M. Kudela. "Ocean color quality control masks contain the high phytoplankton fraction of coastal ocean observations." Special Issue, *Coastal Waters Monitoring Using Remote Sensing Technology* in *Remote Sensing* 11, no. 18 (September 2019): 2167. <https://doi.org/10.3390/rs11182167>.

Kudela, R.M., S.B. Hooker, **H.F. Houskeeper**, and M.L. McPherson. "The influence of signal to noise ratio of legacy airborne and satellite sensors for simulating next-generation coastal and inland water products." Special Issue, *State-of-the-Art Remote Sensing in North America 2019* in *Remote Sensing* 11, no. 18 (September 2019): 2071. <https://doi.org/10.3390/rs11182071>.

TECHNICAL PUBLICATIONS (PEER-REVIEWED)

Hooker, S.B., R.N. Lind, J.H. Morrow, J.W. Brown, K. Suzuki, **H.F. Houskeeper**, T. Hirawake, and E.R. Maure. *Enhanced legacy and state-of-the-art instrument suites*. Vol. 1 of *Advances in Above- and In-Water Radiometry*. NASA Goddard Space Flight Center, Greenbelt, Maryland, 68pp. (November 2018): NASA/TP-2018-219033/Vol. 1.

Hooker, S.B., R.N. Lind, J.H. Morrow, J.W. Brown, R.M. Kudela, **H.F. Houskeeper**, and K. Suzuki. *Autonomous atmospheric and oceanic observing systems*. Vol. 2 of *Advances in Above- and In-Water Radiometry*. NASA Goddard Space Flight Center, Greenbelt, Maryland, 69 pp. (November 2018): NASA/TP-2018-219033/Vol. 2.

Hooker, S.B., R.N. Lind, J.H. Morrow, J.W. Brown, R.M. Kudela, **H.F. Houskeeper**, and K. Suzuki. *Hybridspectral next-generation optical instruments*. Vol. 3 of *Advances in Above- and In-Water Radiometry*. NASA Goddard Space Flight Center, Greenbelt, Maryland, 39 pp. (November 2018): NASA/TP-2018-219033/Vol. 3.

NON-REFEREED PUBLICATIONS

Mantha, K., R. Sankar, Y. Zheng, L. Fortson, T. Pengo, D. Mashek, M. Sanders, T. Christensen, J. Salisbury, L. Trouille, J.E.K. Byrnes, I. Rosenthal, **H.F. Houskeeper**, and Ky.C. Cavanaugh. "From Fat Deposits to Floating Forests: Cross-Domain Transfer Learning using PatchGAN-based Segmentation Model." *CIKM/HIL-DC* (October 2022). <https://doi.org/10.48550/arXiv.2211.03937>.

PAPERS IN REVIEW

Newman, E.A., M.Q. Wilber, A. Génin, O.E. Chafe, **H.F. Houskeeper**, S. Lee, E. Berlow, and J. Harte. "Developing a macroecology for human-altered ecosystems." *Ecography* (Revised).

Frieder, C.A., T.W. Bell, H. Berry, Ky.C. Cavanaugh, D. Claar, J. Freiwald, B. Grime, S. Hamilton, **H.F. Houskeeper**, N. Lombardo, S. Marion, T.A. McHugh, G. McKenna, P.E. Parnell, P. Spector, and S.B. Weisberg. "Developing a status and trends assessment for kelp canopies across large geographic areas." *Environmental Science & Technology* (Submitted).

PROPOSALS SUBMITTED (WITHIN TRAILING 12 MONTHS)

June 2025	Access to the Sea Johnson, J.J. and H.F. Houskeeper . <i>Coupled optical and broadband acoustic sensing for commercial kelp farm biomass assessment</i> . \$74,700.	WHOI
May 2025	Pivot Research Award Prochaska, J.X. (External PI) and H.F. Houskeeper (WHOI PI). <i>Sea meets the stars</i> . WHOI sub-award: \$149,985.	Simons Foundation
April 2025	ROSES A.48 . Commercial Satellite Data Earth Science Research and Applications Houskeeper, H.F. , Ky.C. Cavanaugh, H. Druckenmiller, and Ka.C. Cavanaugh. <i>Fine-Resolution Observing of Nearshore Dynamics (FRONDS)</i> . \$456,276.	NASA
April 2025	ROSES A.64 . FORTE Science Team Guimond, J., T.W. Bell, and H.F. Houskeeper . <i>TIDE-Arctic: Tracking tundra interface degradation and exchange in the Arctic</i> . \$767,988.	NASA
March 2025	ROSES A.60 . Earth Action: Ecological Conservation Houskeeper, H.F. and T.W. Bell. <i>Namibia aquaculture monitoring for intelligent biomass harvesting & assessment (NAMIBIA)</i> . \$899,889.	NASA
March 2025	ROSES A.60 . Earth Action: Ecological Conservation Bell, T.W. and H.F. Houskeeper . <i>KAWS: Kelp advanced warning system for analysis and management</i> . \$1,145,920.	NASA
February 2025	Small Business Innovative Research (SBIR) Lind, R. (External PI) and H.F. Houskeeper (WHOI PI). <i>Hyperspectral Optical Profiling System with Advanced Dynamic Vertical Sampling Resolution (Hy-OPS ADVSR)</i> . WHOI sub-award: \$33,591.	NASA
February 2025	ROSES A.36 . The Science of PACE Houskeeper, H.F. , Z. Liu, and D.J. McGillicuddy. <i>Mesoscale and sub-mesoscale regulation of phytoplankton community composition and carbon export</i> . \$888,470.	NASA
January 2025	N/A (Verbal Request for Proposal). Bell, T.W. and H.F. Houskeeper . <i>Development of KelpWatch: increasing stakeholder access</i> . \$39,121.	The Nature Conservancy (TNC)
January 2025	IR&D Houskeeper, H.F. <i>Hyperspectral sensing of unknown quantities of the non-visible aquatic sunlit light field</i> . \$77,422.	WHOI
October 2024	N/A (Verbal Request for Proposal). Houskeeper, H.F. <i>Comparison of aerial and Landsat imagery along the northern U.S. West Coast</i> . \$29,853.	Southern California Coastal Water Research Project (SCCWRP)
September 2024	NSF 24-574 . Biology on a Changing Planet Bell, T.W. and H.F. Houskeeper . <i>Understanding and predicting drivers of kelp forest biodiversity on a changing planet</i> . \$652,29.	NSF
July 2024	N/A (Verbal Request for Proposal). Bell, T.W. and H.F. Houskeeper [†] . <i>Harvest impact assessment for giant and bull kelp</i> . \$250,000. [†] Contributed to writing but not named in proposal.	Ocean Protection Council (OPC)

TEACHING / SERVICE

2025 – Present	Planning Committee: Ocean Optics XXVII Conference (Fall 2026) Serving in the conference planning via raising funds, reviewing abstracts, organizing sessions and trainings, and co-managing the speaker nominations. Chair: Griet Neukermans, Ghent University.	The Oceanography Society
----------------	---	--------------------------

2023 – Present	Faculty Mentor: Ocean Remote Sensing Group Mentoring 6 undergraduate students (annually) on independent ocean science research projects. The student projects leverage <i>in situ</i> , airborne, and satellite optical observations and have resulted in senior thesis or honors capstones, conference presentations, and a student-led peer-reviewed publication.	NASA Student Airborne Research Program
2021	Lecturer: Department of Geography Geography 1: <i>Earth's Physical Environment</i> . Provided lectures and developed lab assignments and exams. Course topic: Earth system processes, including circulation patterns and structure of Earth's oceans and atmosphere. Enrollment: 96.	University of California, Los Angeles
2017 – 2018	Graduate Mentor: Ocean Remote Sensing Group Mentored 15 undergraduate students on independent remote sensing projects on topics including remote sensing of water-quality, detection of marine debris, and bull kelp canopy satellite remote sensing (Finger et al. 2021 <i>Rem. Sens. Env.</i>). One of my mentored students from the 2017 cohort defended in the WHOI-MIT Joint Program this year, and I received a NASA Honor Award for Group Achievement for mentorship of the 2018 cohort.	NASA Student Airborne Research Program

PRESENTATIONS

*Led by Mentored Student

Pantano, C., C. Lagger, N. Arafeh Dalmau, T.W. Bell, A. Aguilar, and **H.F. Houskeeper**. Submitted for December 2025. Protection and distribution of kelp forests with floating canopy in Argentina. Talk at the *XII Jornadas Nacionales de Ciencias del Mar* of the *XX Coloquio de Oceanografía* meeting, Puerto Madryn, CH, ARG.

Reshitnyk, L.Y., A. Aguilar, T.W. Bell, M. Hessing-Lewis, **H.F. Houskeeper**, L. Man, and O. Pontier. February 2025. Multi-scale mapping of charismatic megafauna: leveraging long-term site and regional level spatial data to inform satellite-based remote sensing of kelp forests in British Columbia, Canada. Talk at the *BioSpace25* meeting, Frascati, LZ, ITA.

Houskeeper, H.F., A. Aguilar, S.T. Gonzalez, A.J. Smit, L.V. Dunga, and T.W. Bell. December 2024. Hyperspectral optical signatures of canopy-forming macroalgae in the Western Cape province of South Africa. Poster at the fall meeting of the *American Geophysical Union*, Washington D.C., USA.

*Cavanaugh, Ka.C., T.W. Bell, Ky.C. Cavanaugh, M. Gierach, **H.F. Houskeeper**, B. Beckley, and K. Emery. December 2024. Quantifying kelp canopy traits with airborne imaging spectroscopy. Talk at the fall meeting of the *American Geophysical Union*, Washington D.C., USA.

*Aguilar, A., **H.F. Houskeeper**, C. Pantano, and T.W. Bell. November 2024. Multidecadal remote sensing of kelp forests in Argentina. Talk at the fall meeting of the *Western Society of Naturalists*, Portland, OR, USA.

Houskeeper, H.F., D.J. McGillicuddy, C. Hu, A.J. Smit, and T.W. Bell. October 2024. Hyperspectral physiological indicator analogs across taxa of brown algae. Poster at the *Ocean Optics XXVI* meeting, Las Palmas, GC, ESP.

Oliver, H., J.S. Turner, A. Castagna, **H.F. Houskeeper**, and H. Dierssen. October 2024. Rethinking Antarctic polynyas: minimizing ocean color remote sensing adjacency effects along icy coasts. Poster at the *Ocean Optics XXVI* meeting, Las Palmas, GC, ESP.

Bell, T.W., **H.F. Houskeeper**, S. Gonzalez, and A. Aguilar. October 2024. Physiological dynamics of kelp forests in the Greater Cape Floristic Region. Virtual talk at the fall meeting of *NASA BioSCape*.

*Aguilar, A., **H.F. Houskeeper**, C. Patano, and T.W. Bell. June 2024. Multidecadal remote sensing of kelp forests in Argentina. Talk at the *Aquatic Sciences Meeting* of the *Association for the Sciences of Limnology and Oceanography*, Madison, WI, USA.

Houskeeper, H.F., Ka.C. Cavanaugh, Ky.C. Cavanaugh, and T.W. Bell. February 2024. Global Relationships of Kelp Forests and Climate Modes. Talk at the *Ocean Sciences Meeting*, New Orleans, LA, USA.

Bell, T.W., and **H.F. Houskeeper**. February 2024. Physiological dynamics of floating macroalgae: the potential for future hyperspectral satellites. Talk at the *Ocean Sciences Meeting*, New Orleans, LA, USA.

Houskeeper, H.F., S.B. Hooker, and T.W. Bell. June 2023. Shortwave infrared radiometry of aquatic environments. Talk at the *Aquatic Sciences Meeting of the Association for the Sciences of Limnology and Oceanography*, Palma, PM, ESP.

Houskeeper, H.F., T.W. Bell, A. Mora-Soto, and Ky.C. Cavanaugh. January 2023. Long-term variability in giant kelp dynamics across the west coasts of North and South America. Talk at the *International Temperature Reef Symposium*, Hobart, TAS, AUS.

Bell, T.W., Ky.C. Cavanaugh, V. Saccomanno, Ka.C. Cavanaugh, **H.F. Houskeeper**, N. Eddy, F. Shuetzenmeister, N. Rindlaub, and M. Gleason. January 2023. Exploring kelp resistance and resilience to climate-driven disturbances with Kelpwatch.org, a visualization and analysis webtool. Talk at the *International Temperature Reef Symposium*, Hobart, TAS, AUS.

*Etheridge, J., R.M. Kudela, M. Ayad, and **H.F. Houskeeper**. December 2022. Utilizing Supervised Machine Learning to Derive Water-Leaving Radiance from Existing Geostationary Satellite Imagery. Poster at the fall meeting of the *American Geophysical Union*, Chicago, IL, USA.

Trouille, L., J.E.K. Byrnes, C. Johnson, D. Clement, C. Troy, Ky. Cavanaugh, I. Rosenthal, **H.F. Houskeeper**, Z. Wolfenbarger, and A. Boyer. December 2022. Advancing Biodiversity Monitoring by Directly Integrating Remote Sensing Data with Citizen Science Platforms. Poster at the fall meeting of the *American Geophysical Union*, Chicago, IL, USA.

Houskeeper, H.F., S.B. Hooker, and K.C. Cavanaugh. October 2022. Rapid observations of aquatic environments using the Advanced Baseline Imager. Talk at the *Ocean Optics XXV* meeting, Quy Nhon, Binh Dinh, VNM.

Houskeeper, H.F., S.B. Hooker, and Ky.C. Cavanaugh. February 2022. Approaches for leveraging spectrally simple geostationary observations. Virtual poster at the *Ocean Sciences Meeting of the Association for the Sciences of Limnology and Oceanography*.

Guild, L.S., S. Dunagan, J. Eilers, R.M. Kudela, K. Negrey, S.B. Hooker, J. Morrow, S. Palacios, **H.F. Houskeeper**, A. Bucholtz, H. Jonsson, R. Woods, and G. Cooper. August 2021. Coastal and inland water calibration, validation, and research of water quality and ecosystems in support of imaging spectroscopy. Virtual talk at the Vital Connections in Ecology meeting of the *Ecological Society of America*.[↗]

Assis, J., L. Marquez, K. Cavanaugh, E. Fragkopoulou, **H.F. Houskeeper**, and E.A. Serrão. July 2021. Artificial Intelligence Convolutional Neural Networks construct a time series of key marine forest ecosystem-structuring species from satellite imagery. Virtual talk at the *Advances in Marine Ecosystem Modeling Research* meeting.

Houskeeper, H.F., I.S. Rosenthal, K.C. Cavanaugh, C. Pawlak, L. Trouille, J.E.K. Byrnes, T.W. Bell, and K.C. Cavanaugh. June 2021. Remote sensing of giant kelp with citizen science - a NASA Floating Forests project update. Virtual talk at the *Aquatic Sciences Meeting of the Association for the Sciences of Limnology and Oceanography*.

Guild, L.S., S.B. Hooker, R.M. Kudela, **H.F. Houskeeper**, S.E. Dunagan, and J.A. Eilers. December 2020. Airborne sensor combination for calibration, validation, and research in dynamic aquatic systems. Poster at the fall meeting of the *American Geophysical Union*, San Francisco, CA, USA.[↗]

Houskeeper, H.F., C.A. Edwards, and R.M. Kudela. February 2020. Evaluation of empirical and dynamic primary production estimates for the California Current System. Poster at the *Ocean Sciences Meeting of the Association for the Sciences of Limnology and Oceanography*, San Diego, CA, USA.[↗]

McPherson, M., D.J.I. Finger, R.M. Kudela, and **H.F. Houskeeper**. February 2020. Using a long-term Landsat timeseries to understand the effects of marine heatwaves on unprecedented declines in Northern California bull kelp. Talk at the *Ocean Sciences Meeting of the Association for the Sciences of Limnology and Oceanography*, San Diego, CA, USA.[↗]

*Finger, D.J.I., M. McPherson, **H.F. Houskeeper**, and R.M. Kudela. December 2019. Mapping bull kelp canopy in Northern California using Landsat to enable long-term monitoring. Poster at the fall meeting of the *American Geophysical Union*, San Francisco, CA, USA.[↗]

Houskeeper, H.F. and R.M. Kudela. October 2018. Behind the masks in coastal ocean color. Extended Abstract and Poster at the *Ocean Optics Meeting #24*, Dubrovnik, HRV.[↗]

* Jones, A.E., **H.F. Houskeeper**, and R.M. Kudela. February 2018. Impact on phytoplankton composition in the Santa Barbara Channel from the 2013-2015 warm water anomaly. Poster at the *Ocean Sciences Meeting* meeting of the *Association for the Sciences of Limnology and Oceanography*, Portland, OR, USA. [↗](#)

* Renshaw, A., **H.F. Houskeeper**, and R.M. Kudela. December 2017. Landsat evidence of the decline of Northern California bull kelp. Poster at the fall meeting of the *American Geophysical Union*, New Orleans, LA, USA. [↗](#)

* Dawson, T.T., **H.F. Houskeeper**, S.L. Palacios, M.B. Peacock, and R.M. Kudela. December 2017. Dried out: phytoplankton drought response in the San Francisco Estuary. Poster at the fall meeting of the *American Geophysical Union*, New Orleans, LA, USA. [↗](#)

Houskeeper, H.F. and R.M. Kudela. May 2017. Adding a dinoflagellate PFT for Monterey Bay, CA. Poster at the *International Ocean Colour Sciences* meeting, Lisbon, PORT.

Houskeeper, H.F. and R.M. Kudela. December 2016. Evaluating the addition of a dinoflagellate functional type in Monterey Bay, CA. Poster at the fall meeting of the *American Geophysical Union*, San Francisco, CA, USA.

ADDITIONAL TRAINING RECEIVED

Forthcoming August 2025	NASA PI Launchpad NASA workshop for expanding the PI pool for space missions. My application proposed to develop an ultraviolet spaceborne sensor for characterizing surface ocean properties.	NASA Ames Research Center
2022	Google Cloud Research Innovator Program Developed initial ocean color code library for adding oceanographic applications to existing geostationary weather satellites. Met periodically with Google cloud engineers to learn how improve automation of image processing, training which improved the kelp mapping capabilities we use today for global kelp forest mapping on https://kelpwatch.org/ .	Google
2019	Student: NASA Ocean Optics Summer Course Studied introductory concepts in optical oceanography. Developed a student project investigating absorption band effects as a tool for retrieving phytoplankton absorption from underway shipboard observations of beam attenuation (<i>Applied Optics</i> 2020).	University of Maine, Darling Marine Center

AWARDS

August 2022	NASA Honor Award for Group Achievement Mentorship for 2018 SARP cohort.	NASA Student Airborne Research Campaign
November 2020	NASA Honor Award for Group Achievement Airborne and in-water field validation activities during active wildfires.	NASA C-HARRIER Mission, 2018-2019 Campaign
July 2018	NASA Honor Award for Group Achievement Airborne and in-water field bio-optical matchups.	NASA C-HARRIER Mission, 2017-2018 Campaign

IN THE NEWS

Spring 2025	Global Efforts to Map and Monitor Kelp Forests Extend to South Africa and Namibia https://ecomagazine.com/news/coastal/new-global-efforts-to-map-and-monitor-kelp-forests-extend-to-south-africa-and-namibia/	Eco Magazine
Spring 2023	New Study Uncovers Declines in Kelp Forests Along Monterey Peninsula https://www.ecomagazine.com/news/coastal/new-study-uncovers-declines-in-kelp-forests-along-monterey-peninsula	Eco Magazine

INVITED TALKS / TRAININGS PROVIDED

June 2025	Kelp forest dynamics of southern Africa Remote sensing of the coastal ocean and inland waters.	NASA Student Airborne Research Program
May 2025	Updates from three field campaigns in southern Africa New findings regarding kelp forest distribution and composition in South Africa plus Namibia.	Kelp Mappers Meeting
April 2025	Training: Satellite monitoring for kelp aquaculture applications Satellite methods to remotely assess biomass for harvest applications.	KelpBlue, Lüderitz, Namibia
December 2024	Dynamics of kelp forests in different ocean regions Global variability in the resilience and recovery of canopy forming kelp forests.	American Meteorological Society; UW Madison Chapter
October 2024	Kelp remote sensing case studies for Oregon Quality assessments of remote kelp forest monitoring systems.	Southern California Coastal Water Research Project
June 2024	Optical relationships of Earth's aquatic environments Remote sensing of the coastal ocean and inland waters.	NASA Student Airborne Research Program
April 2024	Optical dynamics and distributions of the sunlit ocean Optical quantities of the sunlit ocean in relation to the microbial environment.	Woods Hole Oceanographic Institution
February 2024	Absolute radiometric characterizations of aquatic environments Optical properties of inland waters and estuaries.	NASA Ames Research Center
October 2023	Training: Field spectroscopy to support kelp remote sensing Presentation of field methods for spectroscopic characterizations of kelp blades.	NASA BioScape Campaign
June 2023	Remote sensing of Earth's aquatic environments Opportunities to advance aquatic science by leveraging NASA suborbital remote sensing platforms.	NASA Student Airborne Research Program
July 2022	Satellite observations of giant kelp forests for global analyses Updates on development of a giant kelp satellite observing system.	NOAA Ocean Color Coordinating Group
May 2022	Mid-latitude coastal environments Drivers of temperature and nutrient variability and their effects on rocky reef ecosystems.	UCLA Atmospheric & Ocean Sciences course: Biological Oceanography
May 2022	Automated detection of giant kelp surface canopy using Landsat Update for scaling kelp canopy observing system to include western South America.	Kelp Mappers Meeting
May 2022	Absolute radiometry in coastal and inland waters Seminar in the department of Applied Ocean Physics and Engineering.	Woods Hole Oceanographic Institution
April 2022	Kelp forests and the El Niño Southern Oscillation Temperature effects to mid-latitude coastal environments.	Bowdoin College course: Equatorial Oceanography
June 2021	Automated detection of giant kelp canopy Remote observations of giant kelp along the Malvinas or Falkland Islands coastline.	Zooniverse
October 2019	Oceanography of continental margins Structure of the continental shelf and slope, and formation of submarine canyons.	UCSC Earth Sciences course: Oceanography
July 2018	Bio-optics of red tides Optics of phytoplankton blooms and consequences to atmospheric correction for satellite imagery.	NASA Student Airborne Research Program
March 2018	The ocean's role in global climate Biogeochemical cycling of carbon and nutrients, and ocean-atmosphere exchange.	UCSC Ocean Sciences course: Life in the Sea
March 2018	Human impacts on oceanic ecosystems Brief history of global fisheries and overview of current state of select species.	UCSC Ocean Sciences course: Life in the Sea
July 2017	Remote sensing methods for phytoplankton composition Overview of current approaches and regional applications.	NASA Student Airborne Research Program

DATASETS AND ALGORITHMS

Spring 2022	Kelp Forest Classification Neural Network Artificial intelligence (PatchGAN segmentation) model for classifying kelp forest extent in satellite imagery, developed by leveraging citizen science classifications in collaboration with NASA Floating Forests.	https://github.com/ramanakumars/patchGAN-FF
Winter 2022	Kelp Forests Canopy Change through Time Accessible kelp forest dynamic maps disseminated via a user-friendly web interface. Presently undergoing geographic expansion to support global kelp forest habitat.	https://kelpwatch.org
Fall 2021	Falkland Islands Kelp Forests Open-source satellite kelp forest observations from the Falkland Islands (Islas Malvinas).	https://github.com/floatingforests/falkland_islands
Spring 2020	AC-S Chlorophyll Estimation AC-S algorithm to improve robustness of oceanographic and aquatic flow-through data products.	https://github.com/henryhouskeeper/AbsorptionBandEffects

PAPERS IN PREPARATION (Alphabetical)

*Led by Mentored Student

*Aguilar, A., **H.F. Houskeeper**, C. Patano, and T.W. Bell. "Multidecadal remote sensing of kelp forests in Argentina." (In Preparation).

Houskeeper, H.F., N. Arafeh-Dalmau, Ka.C. Cavanaugh, A. Mora-Soto, Ky.C. Cavanaugh, and T.W. Bell. "Long-term variability in giant kelp canopy area in Peru." (In Preparation).

Houskeeper, H.F., S.B. Hooker, R.M. Kudela, and K. Suzuki. "Vertical coherence in the aquatic lightfield." (In Preparation).

Palacios, S.L., L.S. Guild, R.M. Kudela, M. Kacenebogen, K. Knobelspiesse, J. Redemann, and **H.F. Houskeeper**. "Reducing uncertainty of derived aquatic reflectance from imaging spectrometer observations of Monterey Bay, CA, coastal waters using airborne radiometry and sun photometry." (In Preparation).

*Prew, Z., **H.F. Houskeeper**, T.W. Bell, T. Bornman, and A. Smit. "Landsat-derived kelp canopy analysis using generalized additive mixed models." (In Preparation).