

## Curriculum Vitae

### **Brian B Barnes**

#### ***Address***

College of Marine Science, University of South Florida  
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#### ***Professional Preparation***

Ph.D., Marine Science, 2013, College of Marine Science (CMS), University of South Florida (USF), St. Petersburg, FL  
M.S., Marine Science, 2009, Virginia Institute of Marine Science (VIMS), College of William and Mary, Gloucester Point, VA  
B.S., Zoology & Psychology, 2004, University of Florida, Gainesville, FL

#### ***Professional Appointments***

8/2022-present Assistant Research Professor, University of South Florida  
12/2015-8/2022 Research Associate, University of South Florida  
Spring 2016 Adjunct Professor, University of South Florida St. Petersburg  
12/2013-12/2015 Postdoctoral Research Associate, University of South Florida  
08/2006-10/2006 Field & Laboratory Technician, Old Dominion University

#### ***Awards and Fellowships***

2016 USF Global Achievement Group Award  
2014 USF Outstanding Dissertation Award (one of two recipients among >3000 MS & PhD graduates)  
2013 USF CMS William and Elsie Knight Endowed Fellowship for Marine Science  
2012 USF CMS William and Elsie Knight Endowed Fellowship for Marine Science  
2011 USF CMS Jack and Katharine Ann Lake Fellowship in Marine Science  
2009 USF CMS Anne and Werner Von Rosenstiel Fellowship  
2007 VIMS Kelley Watson Fellowship

#### ***Current & Recent Service***

Member, GEO Blue Planet *Sargassum* Working Group (2023-present)  
Organizing Committee Member, 2023 International Ocean Color Symposium  
Member, IOCCG OC-SVC Task Force (2023-present)  
Member, NASA OB.DAAC User Working Group (2022-present)  
Member, IOCCG Benthic Reflectance Working Group (2021-present)  
Member, NASA PACE Science and Applications Team (2020-2024)  
Associate Editor, *Estuaries and Coasts* (2019-present)  
Member, NASA CSDA Evaluation Panels (Capella; 2023-2024, BlackSky; 2022-2023, Airbus; 2021-2022)  
Reviewer, 4 NASA panels (2017, 2018, 2021, 2023); LISS external review (2019); NASA external review (2016, 2019, 2023, 2024)  
Volunteer, National Ocean Sciences Bowl, Great American Teach-In, Skype-a-scientist, Science Fair

#### ***External Grant Acquisitions***

22 funded proposals totaling \$9,438,841 (BB Barnes's portion: \$3,851,460)

- [1] PI (NOAA) Developing an operational *Sargassum* HAB monitoring and forecasting system for the southeastern US and US Caribbean waters (\$3,750,073; BB Barnes's portion: \$966,250) 9/1/2023 – 8/31/2028
- [2] PI (NOAA-CARICOOS) Continued enhancement and maintenance of satellite-based virtual buoys to assess water quality in coastal Puerto Rico and the US Virgin Islands (\$30,000) 7/1/2023 – 6/30/2024
- [3] PI (NASA) On the capacity of Capella Space X-band SAR in detecting floating matters (\$99,996) 3/6/2023 – 3/5/2024
- [4] PI (EPA) Determining long-term trends in Florida Keys water quality and linkages to *Synechococcus* and *Sargassum* blooms: Implications for management decisions (\$395,486; BB Barnes's portion: \$208,731) 7/1/2023 – 6/30/2024
- [5] Co-PI (ExxonMobil) Long-term assessment of algal blooms and water quality in coastal waters around Qatar: Retrospective geospatial analysis (\$99,999; BB Barnes's portion: \$19,393) 4/1/2022 – 3/31/2023
- [6] PI (NOAA-CARICOOS) Enhancing and maintaining satellite-based virtual buoys to assess water quality in coastal Puerto Rico and the US Virgin Islands (\$30,000) 7/1/2021 – 6/30/2022
- [7] Co-PI (NASA) Evaluation of BlackSky imagery in detecting cyanobacteria blooms (\$99,993, BB Barnes's portion: \$19,393) 6/1/2022 – 5/31/2023
- [8] PI (NASA) Linking biogeochemical and optical water quality in coastal and inland waters: Data synthesis, algorithm development, and effective product delivery (\$587,389) 09/01/2022 – 08/31/2025
- [9] Co-PI (NASA) Evaluation of Airbus X-band SAR data in remote sensing of marine debris (\$99,993; BB Barnes's portion: \$35,219) 08/01/2021 – 07/31/2022
- [10] PI (EPA) Determining long-term water quality trends in Biscayne Bay using satellite and in situ data (\$150,645) 3/1/2021 – 2/28/2023
- [11] PI (NOAA-CARICOOS) Establishing satellite-based virtual buoys to assess water quality in coastal Puerto Rico and the US Virgin Islands (\$50,000) 6/1/2021 – 5/31/2022
- [12] PI (NASA) Spectral matching inversion algorithms for PACE application in optically shallow waters: an assessment using HICO and PRISM data (\$532,509) 8/1/2020 – 7/31/2023
- [13] Co-PI (NASA) Thermal stress in South Florida estuaries: A multi-sensor assessment (\$306,639; BB Barnes's portion: \$52,807) 11/1/2019 – 10/21/2022
- [14] Co-I (NASA) Precipitation, water management, and algae blooms in South Florida estuaries (\$1,174,105; BB Barnes's portion: \$50,338) 4/1/2019 – 3/31/2022
- [15] Co-I (NASA) On the capacity of commercial high-resolution satellite data in mapping and quantifying macroalgae and microalgae in aquatic environments (\$98,329; BB Barnes's portion: \$48,329) 1/1/2019 – 12/31/2019
- [16] PI (EPA) Continuation: Assessment of baseline turbidity condition in the Port Everglades region from satellite data (\$8,000) 10/1/2018 – 9/30/2019

- [17] Institutional PI/Co-I (NASA) Remote sensing algorithms for water quality and primary production in Apalachee Bay, FL (\$442,204; BB Barnes's portion: \$188,385) 1/1/2018 – 12/21/2020
- [18] Co-I (NOAA) Calibration/Validation support for NPP VIIRS data product continuity (\$451,373; BB Barnes's portion: \$197,368). 7/1/2018 – 6/30/2020
- [19] PI (NASA) Synergistic multi-sensor calibration for global and coastal observations of aquatic environments (\$443,698) 1/1/2017 – 12/31/2109
- [20] PI (EPA) Assessment of baseline turbidity condition in the Port Everglades region from satellite data (\$23,657) 10/1/2016 – 9/30/2019
- [21] Institutional PI/Co-I (NASA) The development of a water clarity index for the Great Lakes as a climate indicator (\$565,023; BB Barnes's portion: \$179,443) 5/1/2016 – 4/30/2019
- [22] Participant (USGS) Local-scale ecosystem resilience amid global-scale ocean change: the coral reef example. USGS Powell Center Working Group

### ***Publications***

GoogleScholar statistics (01/24/24): Citations: 2535; h-index: 28; i10-index: 46  
<https://scholar.google.com/citations?user=pzudCYcAAAAJ&hl=en&oi=ao>  
 Key: **BB Barnes**, as corresponding author\*, *student*, postdoc advised by BBB

### **Academic Journals**

- [1] *Y Yao*, C Hu, JP Cannizzaro, S Zhang, **BB Barnes**, *Y Xie*, L Qi, C Armstrong, Z Chen (2024) Detecting cyanobacterial blooms in the Caloosahatchee River and Estuary using PlanetScope imagery and deep learning. *IEEE Trans. Geosci. Remote Sens.* **62**:4202513  
<https://doi.org/10.1109/TGRS.2024.3354211>
- [2] FB Ntumngia, SK Kolli, PA Subramani, SJ Barnes, *J Nicholas*, MM Ogbondah, **BB Barnes**, ND Salinas, P Thawornpan, NH Tolia, P Chootong, JH Adams (2024) Naturally acquired antibodies against *Plasmodium vivax* pre-erythrocytic stage vaccine antigens inhibit sporozoite invasion of human hepatocytes *in vitro*. *Sci. Rep.* **14**:1260 <https://doi.org/10.1038/s41598-024-51820-2>
- [3] *Y Zhang*, C Hu, DJ McGillicuddy, **BB Barnes**, Y Liu, V Kourafalou, *S Zhang*, FJ Hernandez (2024) Pelagic *Sargassum* in the Gulf of Mexico driven by ocean currents and eddies. *Harmful Algae* **132**:102566  
<https://doi.org/10.1016/j.hal.2023.102566>
- [4] *C Lopez-Gamundi*, **BB Barnes**, AC Bakker, PM Harris, GP Eberli, SJ Purkis (2023) Spatial, Seasonal, and Climatic Drivers of Suspended Sediment atop Great Bahama Bank. *Sedimentology* <https://doi.org/10.1111/sed.13151>
- [5] *Y Yao*, C Hu, JP Cannizzaro, **BB Barnes**, DC English, *Y Xie*, K Hubbard, M Wang (2023) Detection of *Karenia brevis* red tides on the West Florida Shelf using VIIRS observations: Accounting for spatial coherence with artificial intelligence. *Remote Sens Environ* **298**:113833  
<https://doi.org/10.1016/j.rse.2023.113833>
- [6] S Kabir, N Pahlevan, RE O'Shea, **BB Barnes** (2023) Leveraging Landsat-8/-9 underfly observations to evaluate consistency in reflectance products over

- aquatic environments. *Remote Sens Environ* **296**:113755  
<https://doi.org/10.1016/j.rse.2023.113755>
- [7] Y Zhang, C Hu, **BB Barnes**, Y Liu, V Kourafalou, D McGillicuddy, JP Cannizzaro, DC English, C Lembke (2023) Bio-optical, physical, and chemical properties of a Loop Current eddy in the Gulf of Mexico. *J Geophys Res: Oceans* e2022JC018726. <https://doi.org/10.1029/2022JC018726>
- [8] C Hu, S Zhang, **BB Barnes**, Y Xie, M Wang, JP Cannizzaro, DC English (2023) Mapping and quantifying pelagic *Sargassum* in the Atlantic Ocean using multi-band satellite data and deep learning. *Remote Sens Environ* **289**:113515 <https://doi.org/10.1016/j.rse.2023.113515>
- [9] M Xu, **BB Barnes\***, C Hu, PR Carlson, LA Yarbrow (2023) Water clarity monitoring in complex coastal environments: Leveraging seagrass light requirement towards more functional satellite ocean color algorithms. *Remote Sens Environ* **286**:113418 <https://doi.org/10.1016/j.rse.2022.113418>
- [10] Y Yao, C Hu, **BB Barnes** (2023) Mysterious increases of whiting events in the Bahama Banks. *Remote Sens Environ* **285**:113389  
<https://doi.org/10.1016/j.rse.2022.113389>
- [11] C Hu, L Qi, DC English, M Wang, K Mikelsons, **BB Barnes**, MM Pawlik, D Fick (2023) Pollen in the Baltic Sea as viewed from space. *Remote Sens Environ* **284**:113337 <https://doi.org/10.1016/j.rse.2022.113337>
- [12] L Qi, C Hu, **BB Barnes**, BE Lapointe, Y Chen, Y Xie, M Wang (2022) Climate controls of seaweed expansion in the East China Sea and Yellow Sea. *Geophys. Res. Lett.* **49**:e2022GL098185  
<https://doi.org/10.1029/2022GL098185>
- [13] **BB Barnes**, SW Bailey, C Hu, BA Franz (2022) Vicarious Calibration of the Long Near Infrared Band: Cross-Sensor Differences in Sensitivity. *IEEE Trans. Geosci. Remote Sens.* **60**:4208109  
<https://doi.org/10.1109/TGRS.2022.3185932>
- [14] M Xu, C Hu, RG Najjar, M Hermann, H Briceno, **BB Barnes**, JOR Johansson, D English (2022) Estimating estuarine primary production using satellite data and machine learning. *Int. J. Appl. Earth. Obs. Geoinf.* **110**:102821  
<https://doi.org/10.1016/j.jag.2022.102821>
- [15] HM Dierssen, R Vandermeulen, **BB Barnes**, A Castagna, E Knaeps, Q Vanhellemont (2022) QWIP: A quantitative metric for quality control of aquatic reflectance spectral shape using the apparent visible wavelength. *Front. Remote Sens.* **3**:869611 <https://doi.org/10.3389/frsen.2022.869611>
- [16] R Elahi, PJ Edmunds, RD Gates, IB Kuffner, **BB Barnes**, I Chollet, TA Courtney, JR Guest, EA Lenz, LT Toth, TS Viehman, ID Williams (2022) Scale dependence of coral reef oases and their environmental correlates. *Ecological Applications* **32**:e2651 <https://doi.org/10.1002/eap.2651>
- [17] Y Zhang, C Hu, VH Kourafalou, Y Liu, DJ McGillicuddy, **BB Barnes**, JM Hummon (2022) Physical characteristics and evolution of a long-lasting mesoscale cyclonic eddy in the Straits of Florida. *Front. Mar. Sci.* **9**:779450  
<https://doi.org/10.3389/fmars.2022.779450>
- [18] S Zhang, C Hu, **BB Barnes**, TN Harrison (2022) Monitoring *Sargassum* inundation on beaches and nearshore waters using PlanetScope/Dove

- observations. *IEEE Geosci. Remote Sens. Lett.* **19**:1503605  
<https://doi.org/10.1109/LGRS.2022.3148684>
- [19] C Hu, L Qi, Y Xie, S Zhang, **BB Barnes** (2022) Spectral characteristics of sea snout reflectance observed from satellites: Implications for remote sensing of marine debris. *Remote Sens Environ* **269**:112842  
<https://doi.org/10.1016/j.rse.2021.112842>
- [20] **BB Barnes**, C Hu, SW Bailey, N Pahlevan, BA Franz (2021) Cross-calibration of MODIS and VIIRS long near infrared bands. *Remote Sens. Environ.* **260**:112439 <https://doi.org/10.1016/j.rse.2021.112439>
- [21] RA Garcia, Z Lee, **BB Barnes**, C Hu, HM Dierssen, EJ Hochberg (2020) Benthic classification and IOP retrievals in shallow water environments using MERIS imagery. *Remote Sens. Environ.* **249**:112015  
<https://doi.org/10.1016/j.rse.2020.112015>
- [22] CC Lee, **BB Barnes**, SC Sheridan, *ET Smith*, C Hu, DE Pirhalla, V Ransibrahmanakul, RE Adams (2020) Using Machine Learning to Model Water Clarity in the Great Lakes. *J Great Lakes Res.* **46**:1501-1510  
<https://doi.org/10.1016/j.jglr.2020.07.022>
- [23] *TA Courtney*, **BB Barnes**, I Cholett, R Elahi, K Gross, JR Guest, IB Kuffner, EA Lenz, CS Rogers, LT Toth, AJ Anderson (2020) Disturbances drive changes in coral community assemblages and coral calcification capacity. *Ecosphere* **11**:e03066 <https://doi.org/10.1002/ecs2.3066>
- [24] *ET Smith*, CC Lee, **BB Barnes**, RE Adams, DE Pirhalla, V Ransibrahmanakul, C Hu, SC Sheridan (2020) A synoptic climatological analysis of the atmospheric drivers of water clarity variability in the Great Lakes. *J Appl. Meteorol. Climatol.* **59**:915-935 <https://doi.org/10.1175/JAMC-D-19-0156.1>
- [25] **BB Barnes**, C Hu, SW Bailey, BA Franz (2020) Sensitivity of Satellite Ocean Color Data to System Vicarious Calibration of the Long Near Infrared Band. *IEEE Trans. Geosci. Remote Sens.* **59**:2562-2578  
<https://doi.org/10.1109/TGRS.2020.3000475>
- [26] L Qi, C Hu, K Mikelsons, M Wang, V Lance, S Sun, **BB Barnes**, J Zhao, and D Van der Zande (2020). In search of floating algae and other organisms in global oceans and lakes. *Remote Sens. Environ.*, 239: 111659  
<https://doi.org/10.1016/j.rse.2020.111659>
- [27] C Hu, **BB Barnes**, L Feng, M Wang, L Jiang (2019) On the interplay between ocean color data quality and data quantity: Impacts of quality control flags. *IEEE Geosci. Remote Sens. Lett.* **17**:745-749  
<https://doi.org/10.1109/LGRS.2019.2936220>
- [28] M Wang, C Hu, **BB Barnes**, G Mitchum, B Lapointe (2019) The Great Atlantic Sargassum Belt. *Science* **365**: 83-87. <https://doi.org/10.1126/science.aaw7912>
- [29] R Cunning, RN Silverstein, **BB Barnes**, AC Baker (2019) Extensive coral mortality and critical habitat loss following dredging associated with remotely-sensed sediment plumes. *Mar. Pollut. Bull.* **145**: 185-199  
<https://doi.org/10.1016/j.marpolbul.2019.05.027>
- [30] J Cannizzaro, **BB Barnes**, C Hu, AA Corcoran, KA Hubbard, E Muhlbach, WC Sharp, LE Brand, CR Kelble (2019) Remote detection of cyanobacterial

- harmful algal blooms of *Synechococcus* in Florida Bay using MODIS data. *Remote Sens. Environ.* **231**: 111227 <https://doi.org/10.1016/j.rse.2019.111227>
- [31] S Chen, C Hu, **BB Barnes**, R Wanninkhof, W-J Cai, L Barbero, D Pierrot (2019) A machine learning approach to estimate surface ocean pCO<sub>2</sub> from satellite measurements. *Remote Sens. Environ.* **228**: 203-226 <https://doi.org/10.1016/j.rse.2019.04.019>
- [32] M Zhang, C Hu, **BB Barnes** (2019) Performance of POLYMER atmospheric correction of ocean color imagery in the presence of absorbing aerosols. *IEEE Trans. Geosci. Remote Sens.* **57**: 6666-6674 <https://doi.org/10.1109/TGRS.2019.2907884>
- [33] S Chen, C Hu, **BB Barnes**, Y Xie, G Lin, and Z Qiu (2019) Improving ocean color data coverage through machine learning. *Remote Sens. Environ.* **222**: 286-302 <https://doi.org/10.1016/j.rse.2018.12.023>
- [34] **BB Barnes**, JP Cannizzaro, D English, C Hu (2019) Validation of VIIRS and MODIS reflectance data in coastal and oceanic waters: An assessment of methods. *Remote Sens. Environ.* **220**: 110-123 <https://doi.org/10.1016/j.rse.2018.10.034>
- [35] M Zhang, C Hu, J Cannizzaro, D English, **BB Barnes**, P Carlson, L Yarbro (2018) Comparison of two atmospheric correction approaches applied to MODIS measurements over North American Waters. *Remote Sens. Environ.* **216**: 442-455 <https://doi.org/10.1016/j.rse.2018.07.012>
- [36] JR Guest, PJ Edmunds, RD Gates, IB Kuffner, AJ Andersson, **BB Barnes**, I Chollett, TA Courtney, R Elahi, K Gross, EA Lenz, S Mitarai, PJ Mumby, HR Nelson, BA Parker, HM Putnam, CS Rogers, LT Toth (2018) A framework for identifying and characterising coral reef “oases” against a backdrop of degradation. *J Appl. Ecol.* **55**: 2865-2875 <https://doi.org/10.1111/1365-2664.13179>
- [37] **BB Barnes**, R Garcia, C Hu, Z Lee (2018) Multi-band spectral matching inversion algorithm to derive water column properties in optically shallow waters: An optimization of parameterization. *Remote Sens. Environ.* **204**: 424-438 <http://dx.doi.org/10.1016/j.rse.2017.10.013>
- [38] J Li, C Hu, Q Shen, **BB Barnes**, B Murch, L Feng, M Zhang (2017) Recovering low quality MODIS-Terra data over highly turbid waters through noise reduction and vicarious calibration: A case study in Taihu Lake. *Remote Sens. Environ.* **197**: 72-84 <http://dx.doi.org/10.1016/j.rse.2017.05.027>
- [39] L Qi, C Hu, **BB Barnes**, Z Lee (2017) VIIRS captures phytoplankton vertical migration in the NE Gulf of Mexico. *Harmful Algae* **66**: 40-46 <http://dx.doi.org/10.1016/j.hal.2017.04.012>
- [40] DE Pirhalla, SC Sheridan, CC Lee, **BB Barnes**, V Ransibrahmanakul, C Hu (2017) Water clarity patterns in South Florida coastal waters and their linkages to synoptic-scale wind forcing. *Sat. Oceanog. Meteorolog.* **1**: 1-15 <http://dx.doi.org/10.18063/SOM.2016.02.003>
- [41] L Feng, C Hu, **BB Barnes**, A Mannino, AK Heidinger, K Strabala, LT Iraci (2017) Cloud and sun glint statistics derived from GOES and MODIS observations over the Intra-Americas Seas for GEO-CAPE mission planning.

- J Geophys. Res. Atmospheres.* **122**: 1725-1745  
<https://doi.org/10.1002/2016JD025372>
- [42] CC Lee, SC Sheridan, **BB Barnes**, C Hu, DE Pirhalla, V Ransibrahmanakul, K Shein (2017) The development of a non-linear auto-regressive model with exogenous input (NARX) to model climate-water clarity relationships: reconstructing an historical water clarity index for the coastal waters of the southeastern US. *Theor. Appl. Climatol.*, **130**: 557-569  
<https://doi.org/10.1007/s00704-016-1906-7>
- [43] C Hu, B Murch, **BB Barnes**, M Wang, J-P Maréchal, J Franks, D Johnson, B Lapointe, DS Goodwin, JM Schell, ANS Suida (2016) *Sargassum* watch warns of incoming seaweed. *EOS*. **97**:10-15  
<http://dx.doi.org/10.1029/2016EO058355>
- [44] **BB Barnes** and C Hu (2016) Island building in the South China Sea: detection of turbidity plumes and artificial islands using Landsat and MODIS data. *Sci. Rep.* **6**:33194 <https://doi.org/10.1038/srep33194>
- [45] C Hu, **BB Barnes**, L Qi, C Lembke, D English (2016) Vertical migration of *Karenia brevis* in the northeastern Gulf of Mexico observed from glider measurements. *Harmful Algae*. **58**:59-65  
<https://doi.org/10.1016/j.hal.2016.07.005>
- [46] **BB Barnes** and C Hu (2016) Dependence of satellite ocean color data products on viewing angles: A comparison between SeaWiFS, MODIS, and VIIRS. *Remote Sens. Environ.* **175**:120-129  
<http://dx.doi.org/10.1016/j.rse.2015.12.048>
- [47] C Hu, B Murch, AA Corcoran, L Zheng, **BB Barnes\***, RH Weisberg, K Atwood, JM Lenes (2016) Developing a smart semantic web with linked data and models for near real-time monitoring of red tides in the eastern Gulf of Mexico. *IEEE Systems J.* **10**:1282-1290  
<https://doi.org/10.1109/JSYST.2015.2440782>
- [48] **BB Barnes**, C Hu, C Kovach, R Silverstein (2015) Sediment plumes induced by the Port of Miami dredging: Analysis and interpretation using Landsat and MODIS data. *Remote Sens. Environ.* **170**:328-339  
<https://doi.org/10.1016/j.rse.2015.09.023>
- [49] JJ Walsh, JM Lenes, BP Darrow, AA Parks, RH Weisberg, L Zheng, C Hu, **BB Barnes**, KL Daly, GR Brooks, WH Jeffrey, RA Snyder, D Hollander (2015) A simulation analysis of the plankton fate of the Deepwater Horizon oil spills. *Cont. Shelf. Res.* **107**:50-68 <http://dx.doi.org/10.1016/j.csr.2015.07.002>
- [50] **BB Barnes**, P Hallock, C Hu, F Muller-Karger, DA Palandro, C Walter, R Zepp (2015) Prediction of coral bleaching in the Florida Keys using remotely sensed data. *Coral Reefs*. **34**:491-503 <https://doi.org/10.1007/s00338-015-1258-2>
- [51] C Hu, **BB Barnes**, L Qi, AA Corcoran (2015) A harmful algal bloom of *Karenia brevis* in the Northeastern Gulf of Mexico as revealed by MODIS and VIIRS: A comparison. *Sensors*. **15**:2873-2887  
<https://doi.org/10.3390/s150202873>
- [52] **BB Barnes** and C Hu (2015) Cross-sensor continuity of satellite derived water clarity in the Gulf of Mexico: insights into temporal aliasing and implications

- for long-term water clarity assessment. *IEEE Trans. Geosci. Remote Sens.* **53**:1761-1772 <https://doi.org/10.1109/TGRS.2014.2348713>
- [53] D Sun, C Hu, Z Qiu, JP Cannizzaro, **BB Barnes** (2014) Influence of a red band-based water classification approach on chlorophyll algorithms for optically complex estuaries. *Remote Sens. Environ.* **155**:289-302  
<https://doi.org/10.1016/j.rse.2014.08.035>
- [54] L Qi, C Hu, H Duan, **BB Barnes**, R Ma (2014) An EOF-based algorithm to estimate chlorophyll a concentrations in Taihu Lake from MODIS land-band measurements: Implications for near real-time applications and forecasting models. *Remote Sens.* **6**:10694-10715 <https://doi.org/10.3390/rs61110694>
- [55] CC Wall, P Simard, M Lindemuth, C Lembke, DF Naar, C Hu, **BB Barnes**, FE Muller-Karger, DA Mann (2014) Temporal and spatial mapping of red grouper *Epinephelus morio* sound production. *J. Fish Biol.* **85**:1469-1487  
<https://doi.org/10.1111/jfb.12500>
- [56] **BB Barnes**, C Hu, J Cannizzaro, S Craig, P Hallock, D Jones, N Melo, R Zepp (2014) Estimation of diffuse attenuation of ultraviolet light in optically shallow Florida Keys waters from MODIS measurements. *Remote Sens. Environ.* **140**:519-532 <http://dx.doi.org/10.1016/j.rse.2013.09.024>
- [57] **BB Barnes**, C Hu, K Holecamp, S Blonski, BA Speiring, DA Palandro, BE Lapointe (2014) Use of Landsat data to track historical water quality changes in Florida Keys marine environments. *Remote Sens. Environ.* **140**:485-496  
<http://dx.doi.org/10.1016/j.rse.2013.09.020>
- [58] C Hu, **BB Barnes**, B Murch, P Carlson (2014) Satellite-based virtual buoy system (VBS) to monitor coastal water quality. *Opt Eng.* **53**:051402  
<http://dx.doi.org/10.1117/1.OE.53.5.051402>
- [59] **BB Barnes**, C Hu, BA Schaeffer, Z Lee, DA Palandro, JC Lehrter (2013) MODIS-derived spatiotemporal water clarity patterns in optically shallow Florida Keys waters: a new approach to remove bottom contamination. *Remote Sens. Environ.* **134**:377-391  
<http://dx.doi.org/10.1016/j.rse.2013.03.016>
- [60] **BB Barnes** and C Hu (2013) A hybrid cloud detection algorithm to improve MODIS sea surface temperature data quality and coverage over the Eastern Gulf of Mexico. *IEEE Trans. Geosci. Remote Sens.* **51**:3273-3285  
<https://doi.org/10.1109/TGRS.2012.2223217>
- [61] J Zhao, **BB Barnes**, N Melo, D English, B Lapointe, F Muller-Karger, B Schaeffer, C Hu (2013) Assessment of satellite-derived diffuse attenuation coefficients and euphotic depths in south Florida coastal waters. *Remote Sens Environ.*, **131**:38-50 <http://dx.doi.org/10.1016/j.rse.2012.12.009>
- [62] D Lirman, S Schopmeyer, D Manzello, LJ Gramer, W Precht, F Muller-Karger, K Banks, **BB Barnes**, et al. (2011) Severe 2010 cold-water event caused unprecedented mortality to corals of the Florida Reef Tract and reversed previous survivorship patterns. *PLOS ONE*, I, 6: e23047.  
doi:10.1371/journal.pone.0023047  
<https://doi.org/10.1371/journal.pone.0023047>

- [63] **BB Barnes**, C Hu, F Muller-Karger (2011) An Improved High-Resolution SST Climatology to Assess Cold Water Events off Florida, *IEEE Geosci. Remote Sens. Lett.* **8**:769-773 <https://doi.org/10.1109/LGRS.2011.2111353>
- [64] **BB Barnes**, MW Luckenbach, PR Kingsley-Smith (2010) Oyster Reef Community interactions: the Effect of Resident Fauna on Oyster (*Crassostrea* spp.) Larval Recruitment, *J. Exp. Mar. Biol. Ecol.*, **391**:169-177 <http://dx.doi.org/10.1016/j.jembe.2010.06.026>

#### **Books, White Papers, Published Reports, Protocols**

- [65] BC Johnson, G Zibordi, *et al.* including **BB Barnes** (in revision) System Vicarious Calibration requirements for satellite ocean colour missions targeting climate and global long-term operational applications. IOCCG System Vicarious Calibration Task Force White Paper: Requirements & Recommendations
- [66] A Sayer, A Ibrahim, *et al.* including **BB Barnes** (in prep) Understanding and treatment of uncertainty sources for the NASA PACE mission
- [67] N Opelet, A Dekker, G Casal, P Gege, **BB Barnes**, J Goodman, T Kuster, E Scrivner (in revision) Remote Mapping of Shallow Water Benthos. In HM Dierssen, (Ed.) *IOCCG Report on Benthic Reflectance*

#### ***Teaching experience***

Spring 2016: Adjunct Professor – BSC2011 Biology 2: Biological Diversity Lecture (undergraduate level). 48 Students, 4.74/5.00 overall instructor rating

Spring 2012: Teaching Assistant – Marine Resource Remote Sensing (graduate level)

Fall 2010: Teaching Assistant – Practical IDL Programming (graduate level)

Spring 2010: Teaching Assistant – Optical Oceanography (graduate level)

#### ***Mentorship***

##### Graduate Committees:

Chih-Wei Huang (MS, USF, Spring 2019) Thesis: Estimating Coastal Water Turbidity Using VIIRS Nighttime Measurement. Major advisor: Chuanmin Hu

Yingjun Zhang (PhD, USF, Summer 2022) Dissertation Topic: Mesoscale eddies in the Gulf of Mexico. Major advisor: Chuanmin Hu

Samuel Bunson (MS, USF, current) Floating matters after hurricanes. Major advisor: Chuanmin Hu

Sarah Sullivan (MS, USF, current) *Sargassum* detection from MSI imagery. Major advisor: Chuanmin Hu

Yao Yao (PhD, USF, current) High resolution remote sensing, machine learning for algal bloom detection. Major advisor: Chuanmin Hu

##### Postdoctoral Research Associates:

Dr. Shuai Zhang (USF, Summer 2020-Summer 2022) Projects include *Sargassum* detection and monitoring

Dr. Min Xu (USF, Summer 2020-Summer 2023) Projects include net primary productivity derivations in coastal waters from satellite data, and water quality derivations toward seagrass health assessment and monitoring

- Dr. Yuyuan Xie (USF, Spring 2021-present) Projects include spectral matching algorithm development for optically shallow waters, optical discrimination of phytoplankton types
- Dr. Yingjun Zhang (USF, Fall 2022-present) Eddies, fronts, *Sargassum* aggregations
- Dr. Cheng Xue (USF, Fall 2022-present) Coastal remote sensing, machine learning
- Dr. Madjid Hadjal (USF, Spring 2024-present) Coastal remote sensing, machine learning, SAR detection of floating matters

### *Conference sessions*

- MJ Olascoaga, **BB Barnes**, ANS Siuda, L Martin (Session Co-chair, Moderator) “PI43: The Great Atlantic *Sargassum* Belt: Improving Understanding of *Sargassum* and Associated Communities to Advance Detection, Modeling, and Impact Mitigation.” 2024 Ocean Sciences Meeting. New Orleans, LA, USA. 22 February 2023
- BB Barnes**, F Mélin, K Bisson. (Breakout Workshop Chair, Moderator) “Achieving long-term consistency in cross-sensor ocean color data products” International Ocean Color Symposium. St Petersburg, FL, USA. 16 November 2023

### *Presentations (only as first author / presenter)*

- BB Barnes**, C Hu, Y Xie (Oral Presentation) “*Sargassum* Watch System for monitoring coastal *Sargassum* impacts from satellites: current capabilities and future improvements.” 2024 Ocean Sciences Meeting. New Orleans, LA, USA. 22 February 2024
- BB Barnes** (Oral Presentation) “Breakout workshop report: Achieving long-term consistency in cross-sensor ocean color data products.” 2023 International Ocean Colour Symposium. St. Petersburg, FL, USA. 17 November 2023
- BB Barnes** (Poster Presentation) “Ocean color mission reprocessing in the machine learning era: impacts of vicarious calibration updates on *Sargassum* retrievals.” 2023 International Ocean Colour Symposium. St. Petersburg, FL, USA. 14 November 2023
- BB Barnes** (Invited Presentation) “Optical oceanography in *Sargassum* detection and prediction.” Wider EU-Caribbean Regional Conference on *Sargassum*: Turning *Sargassum* into an opportunity. Santo Domingo, República Dominicana. 15 June 2023
- BB Barnes**, C Hu, Y Xie (Invited Presentation) “Satellite-derived ocean products to support the CARICOOS mission.” Caribbean Coastal Ocean Observing System General Assembly. San Juan, PR. Presented virtually. 19 May 2023
- BB Barnes**, Y Xie (Oral Presentation) “PACE/OCI application in optically shallow waters.” PACE 2023 Science Team and Applications Team Meeting. San Diego, CA. 27 February 2023
- BB Barnes** (Outreach Oral Presentation) “Marine science research: Satellite remote sensing.” Great American Teach-in. McKittrick Elementary School. 17 November 2022
- BB Barnes** (Outreach Oral Presentation) “Marine science research: Satellite remote sensing.” Skype-a-scientist. Evergreen Elementary School. Presented virtually. 4 March 2022

- BB Barnes, Y Xie** (Oral Presentation) “Re-parameterizing benthic albedo for PACE applications.” 2022 Ocean Sciences Meeting. Presented virtually. 28 February 2022
- BB Barnes, Y Xie** (Invited Presentation) “Spectral matching inversion algorithms for PACE application in optically shallow waters.” PACE 2021 Science Team and Applications Team Meeting. Mystic, CT. 06 October 2021
- BB Barnes** (Invited Presentation) “Advancing Satellite Applications for Optically Shallow Waters Using PACE” PACE Applications Water Quality & Resources Focus Session. Presented virtually. 28 July 2021
- BB Barnes** (Invited Presentation) “Spectral matching inversion algorithms for PACE application in optically shallow waters: an assessment using HICO and PRISM data.” NASA PACE IOP Working Group. Presented virtually. 26 August 2020
- BB Barnes, C Hu** (Invited Lecture) “Re-assessing calibration of the long near infrared band” NASA OBPB Webinar Series. Presented virtually. 16 July 2020
- BB Barnes** (Invited Lecture) “Satellite remote sensing and optical oceanography” NASA Webinar Series. Presented virtually. 30 June 2020.
- BB Barnes, C Hu, R Garcia** (Oral Presentation) “Spectral matching inversion algorithms for PACE application in optically shallow waters: an assessment using HICO and PRISM data”. NASA PACE Science Team Meeting. Presented virtually. 2 June 2020
- BB Barnes, C Hu, SW Bailey, N Pahlevan, BA Franz** (Oral Presentation) “Cross-calibration of MODIS and VIIRS long near infrared bands” 2020 Ocean Sciences Meeting, San Diego, CA. 17 February 2020.
- BB Barnes** (Invited Lecture) “Turbidity plume monitoring using satellite data” Nanjing University, Nanjing, China. 14 April 2019.
- BB Barnes, C Hu, SW Bailey, BA Franz** (Poster presentation) “Vicarious calibration of the near infrared band for satellite ocean color sensors” International Ocean Colour Science Meeting 2019, Busan, South Korea. 10 April 2019.
- BB Barnes, RA Garcia, C Hu, Z Lee** (Oral presentation) “A novel multi-band spectral matching inversion algorithm to derive water column properties in optically shallow waters” 2018 Ocean Sciences Meeting, Portland, OR. 15 February 2018.
- BB Barnes** (Oral Presentation) “Sediment plume monitoring using satellite data,” US Coral Reef Task Force Meeting, Fort Lauderdale, FL. 8 August 2017
- BB Barnes** (Oral Presentation) “Sediment plumes resulting from the Port of Miami dredging: Analysis and interpretation using satellite data and long term monitoring programs,” National Marine Fisheries Service, Southeast Region, Habitat Conservation Division annual meeting. 14 July 2016.
- BB Barnes** (Oral Presentation) “Observing sediment plumes from satellite data” Southeast Florida Coral Reef Initiative, Technical Advisory Council meeting, Dania Beach, FL. 27 April 2016.
- BB Barnes, C Hu, C Kovach, R Silverstein** (Oral Presentation) “Sediment plumes resulting from the Port of Miami dredging: Analysis and interpretation using satellite data and long term monitoring programs,” 2016 Ocean Sciences Meeting, New Orleans, LA. 24 February 2016.

- BB Barnes** and C Hu (Poster Presentation) “Dependence of satellite ocean color data products on viewing angles: A comparison between SeaWiFS, MODIS, and VIIRS,” International Ocean Colour Symposium 2015, San Francisco, CA. 16 June 2015.
- BB Barnes** and C Hu (Poster Presentation) “Cross-sensor continuity of satellite derived water clarity in the Gulf of Mexico: insights into temporal aliasing,” 2014 NASA Ocean Color Research Team Meeting, Washington, DC. 6 May 2014.
- BB Barnes**, C Hu, B Schaeffer, Z Lee, and J Lehrter (Oral and Poster Presentations) “On the challenge of deriving MODIS water clarity products in optically shallow environments: How a new approach can improve coral reef research and monitoring,” 21<sup>st</sup> Ocean Optics Conference, Glasgow, Scotland, UK. 8 October 2012.
- BB Barnes**, C Ellis, W Fisher, C Hu, J Lehrter, L McEachron, K O’Keefe, Blake Schaeffer, Bruce Spiering, and L Underwood (Oral Presentation) “Water Clarity Assessment Along the Florida Keys Reef Tract Using Ocean Color Satellite Data,” Florida Keys National Marine Sanctuary Water Quality Protection Program meeting. Key Colony Beach, FL. 26 September 2012.
- BB Barnes** (Outreach Oral Presentation) “Marine Science Research,” Great American Teach-in, Bloomingdale Senior High School, Brandon, FL. 17 November 2011.
- BB Barnes**, C Hu, D Palandro, J Lehrter, N Melo, B Schaeffer, J Cannizzaro, D English (Oral Presentation) “Light attenuation and optics in the Florida Keys,” NASA grant Principal Investigators Meeting. Pensacola, FL. 3 November 2011.
- BB Barnes** (Oral Presentation) “Remote sensing applications in the Florida Keys region,” NASA grant Principal Investigators Meeting. Pensacola, FL. 3 November 2011.
- BB Barnes**. (Oral Presentation) “Synoptic Assessment of Water Quality in the Florida Keys: Improving SST Products During Cold Events,” USF Graduate Student Symposium. January 2011.
- BB Barnes**, C Hu, and F Muller-Karger. (Poster Presentation) “An improved high-resolution sea surface temperature climatology to assess cold events in the Florida Keys,” *Linking Science to Management: A Conference and Workshop on the Florida Keys Marine Ecosystem*. Duck Key, Florida, USA. October 2010.
- BB Barnes**, MW Luckenbach, and PR Kingsley-Smith. (Oral Presentation) “Ecological considerations for oyster restoration: interactions between oyster larvae and reef-associated fauna,” *11<sup>th</sup> International Conference on Shellfish Restoration*. Charleston, South Carolina, USA. November 2008.
- BB Barnes**, MW Luckenbach, and PR Kingsley-Smith. (Oral Presentation) “Interspecific interactions in oyster reef communities: the effect of established epifauna on oyster larval recruitment,” *100<sup>th</sup> Annual National Shellfisheries Association Meeting*. Providence, Rhode Island, USA. April 2008.
- BB Barnes**. (Oral Presentation) “The effect of established epifauna on oyster larval recruitment,” VIMS Departmental Seminar. March 2008.
- BB Barnes**. (Oral Presentation) “Fouling organisms and oyster larval settlement,” VIMS Departmental Seminar. April 2007.

**Media Coverage, Interviews, and Features** (selected)

Print:

- <https://www.floridatoday.com/story/tech/science/space/2024/02/08/nasa-pace-to-collect-florida-data-on-red-tide-seagrass-and-hurricane-forecasts-after-spacex-launch/72450602007/> (02/08/2024)
- <https://www.usf.edu/marine-science/news/2023/ocean-color-science-meeting-draws-experts-from-around-the-world-to-st-petersburg.aspx> (11/21/23)
- <https://www.abcactionnews.com/news/price-of-paradise/how-technology-like-artificial-intelligence-could-help-save-our-oceans> (11/20/23)
- <https://stpetecatalyst.com/new-grant-will-help-usf-pinpoint-seaweed-masses/> (10/24/23)
- <https://earthobservatory.nasa.gov/images/151456/the-subtleties-of-sunglint> (6/14/23)
- <https://earthobservatory.nasa.gov/images/151188/a-massive-seaweed-bloom-in-the-atlantic> (4/8/23)
- <https://www.bbc.com/news/world-us-canada-64971586> (3/16/23)
- <https://www.nbcnews.com/science/environment/sargassum-seaweed-threatens-beaches-florida-mexico-rcna73862> (3/11/23)
- <https://www.vox.com/down-to-earth/2023/5/11/23716884/florida-caribbean-beaches-seaweed-sargassum> (3/11/23)
- [https://pace.oceansciences.org/docs/PACE\\_Newsletter\\_June2022.pdf](https://pace.oceansciences.org/docs/PACE_Newsletter_June2022.pdf) (6/6/22)
- [https://cce.nasa.gov/ocean\\_biology\\_biogeochemistry/research\\_spot.html?spotlightid=73](https://cce.nasa.gov/ocean_biology_biogeochemistry/research_spot.html?spotlightid=73) (6/24/21)
- <https://www.earthdata.nasa.gov/learn/data-user-profiles/user-profile-dr-brian-barnes> (10/23/20)
- <https://crowsneststpete.com/2020/01/13/seeking-answers-to-an-ocean-of-questions/> (1/13/20)

Radio / Podcast:

- <https://www.iheart.com/podcast/1248-beyond-the-news-wfla-inte-43128080/episode/sargassum-forecasting-brian-barnes--126553649/> (10/24/23)
- <https://www.npr.org/2023/05/05/1174024003/sargassum-giant-seaweed-blob-florida> (5/5/23)
- <https://www.bbc.co.uk/sounds/play/p0f93nlm> (3/16/23)
- <https://www.npr.org/2023/03/15/1163385168/sargassum-seaweed-florida-mexico-beaches> (3/15/23)

Live TV / Produced Video:

- <https://www.foxweather.com/watch/play-6be884f690013f0> (Live, 11/3/23)
- <https://www.fox13news.com/news/usf-college-of-marine-science-gets-3-2-million-grant-to-develop-sargassum-forecasting-system> (10/24/23)
- <https://www.youtube.com/watch?v=PvIK0ZGX3og&t=859s> (Curiosity Stream, 7/21/23)
- <https://www.youtube.com/watch?v=B1EweFrksKE> (Live, News Nation, 4/5/23)

<https://www.facebook.com/TheWeatherChannel/videos/seaweed-blob/226977873156059/> (Live, 3/23/23)  
<https://www.foxweather.com/extreme-weather/massive-seaweed-blobs-florida-beaches-spring-break> (3/22/23)  
<https://www.foxweather.com/earth-space/seaweed-sargassum-fla-spring> (Live, 3/21/23)  
<https://www.youtube.com/watch?v=lhlaZMAp8pA> (Live, News Nation, 3/14/23)

## *Upcoming*

### Proposals pending review

- [1] PI (NOAA-CARICOOS) Satellite-based monitoring of CariCOOS waters: Maintaining and upgrading virtual buoys and monitoring *Sargassum* inundation using high-resolution satellite images (\$62,499) 7/1/2024 – 6/30/2025
- [2] PI (NASA) Spatiotemporally-based PACE algorithms for improved optically shallow water retrievals and global applications (\$678,993) 6/1/2024 – 5/31/2027
- [3] Co-I (NASA) Mapping floating matters in the PACE and AI era (\$671,096; BB Barnes's portion: \$64,336) 10/1/2024 – 9/30/2027
- [4] PI (NASA) Detection of various floating matters using Umbra X-band SAR (\$103,629) 08/01/2024 – 07/31/2025

### Manuscripts in progress

- [1] Y Zhang, C Hu, DJ McGillicuddy, Y Liu, **BB Barnes**, V Kourafalou (minor revision) Mesoscale eddies in the Gulf of Mexico: A three-dimensional characterization based on global HYCOM
- [2] Y Yao, C Hu, JP Cannizzaro, **BB Barnes**, Y Zhang (submitted) Potential of the SuperDove constellation in monitoring nearshore red tides
- [3] M Xu, **BB Barnes\***, C Hu, JP Cannizzaro, C Xue, Y Zhang (major revision) Long-term water quality changes in Biscayne Bay derived from satellite observations and machine learning
- [4] Y Xie, **BB Barnes** (in prep) Uncertainties in optically shallow spectral matching routines: the impact of initial parameterization
- [5] **BB Barnes**, Y Xie, C Hu (in prep) Spectral matching optimization routines using OCI-PACE data: redefining benthic albedo parameterization for global implementations