Marilé Colón Robles

Marile.ColonRobles@nasa.gov
Work: 757-864-8672
NASA Langley Research Center
Hampton, VA 23681

Current Position

Project Scientist for NASA GLOBE Clouds
6/2017 - present
Leads and engages with students and teachers through the GLOBE Program by developing activities, programs, and lesson ideas. Develops research using GLOBE Clouds citizen science data. Leads team that collocates cloud observations with satellite data, sends out contact emails to users, and research.

Involvement with The GLOBE Program

- NASA Liaison and At-Large seat in the Science Working Group
- Principal Investigator NASA GLOBE CLOUD GAZE (3/2021 – 12/2022)
  Community science project Leveraging Online and User Data through GLOBE And Zooniverse Engagement **(CLOUD GAZE).** https://www.zooniverse.org/projects/nasaglobe/nasa-globe-cloud-gaze
- Joined the NASA Langley GLOBE Partnership in 2017.
- Project scientist for the clouds protocol since 2017 (link to GLOBE profile page).
- Leads and organizes citizen science events like the 2018 Spring Cloud Challenge, the 2019 Fall Cloud Challenge, and the 2020 Community Cloud Challenge: Science is Better Together.
- Submitted data entry and collaborated with Dr. Helen Amos to write the GLOBE Data Users Guide. Have also worked with Dave Overoye in collaboration to work on the data entry formats for The GLOBE Program's GLOBE Observer app and the cloud wizard.
- Protocol certified in atmospheres in person training 2012 and online training in pedosphere 2018, mosquito and SMAP 2017.
- Participated in and presented at GLOBE Annual Meetings and NARMs since 2017.
- Part of GISN since 2017 with multiple blog posts.
- Judge for GLOBE IVSS projects since 2018.

GLOBE Related Publications

Dodson, J.B., **M. Colón Robles**, T. Rogerson, J. Taylor, (2022). Do Citizen Science Intense Observation Periods increase data usability? A Deepdive of the NASA GLOBE Clouds data set with satellite comparisons. Earth and Space science, in press, https://agupubs.onlinelibrary.wiley.com/doi/abs/10.1029/2021EA002058

Colón Robles, M. (2021, July/August). Cloud Watching for NASA. *Cricket MUSE Science and Exploration for Inquisitive Minds, 25,* 26-27.

Colón Robles, M., Amos, H. M., Dodson, J. B., Bouwman, J., Rogerson, T. M., Bombosch, A., Farmer, L., & Taylor, J. E. (2020). Clouds around the world: How a simple data challenge became a worldwide success. Bull. Amer. Meteor. Soc., 101, E1201–E1213, https://doi.org/10.1175/BAMS-D-19-0295.1.

Amos, H.M, M.J. Starke, T.M. Rogerson, **M. Colón Robles,** T. Andersen, R. Boger, B. Campbell, R. D. Low, P. Nelson, D. Overoye, J.E. Taylor, K.L. Weaver, T.M. Ferrell, H. Kohl (2020). GLOBE Observer Data: 2016-2019 Earth and Space Science, 7, e2020EA001175. https://doi.org/10.1029/2020EA001175.

Colón Robles, M., Bouwman, J., and Smith-Long, C., (2019). Integrating Tech: Making Science Come Alive With Clouds. NSTA Science Scope, vol. 43, no. 4, November 2019. pp. 8-12. https://observer.globe.gov/documents/19589576/52621820/NSTA+Science+SCOPE+Integrating+Tech+with+Clouds/8da3cd4b-8832-47e4-85f4-feee021b7fdb

L. Hayden, J. Taylor and **M. Colon Robles**, "GLOBE: Connecting to Community of Observers Directly to NASA Satellites [Education]," in *IEEE Geoscience and Remote Sensing Magazine*, vol. 7, no. 1, pp. 98-99, March 2019, https://ieeexplore.ieee.org/document/8672158.

Dodson, J.B., **Colón Robles, M.**, Taylor J.E., DeFontes, C.C., Weaver K.L., (2019). Eclipse Across America: Citizen Science Observations of the 21 August 2017 Total Solar Eclipse. Journal of Applied Meteorology & Climatology, https://doi.org/10.1175/JAMC-D-18-0297.1.

Education

M.S., Atmospheric Sciences

University of Illinois at Urbana-Champaign, October 2006
Topics: Cloud Microphysics, Warm rain processes
Thesis: The Influence of Low-level Wind Speed on Droplet Spectra near Cloud Base in Trade Wind Cumulus
Advisor: Robert M. Rauber

Topics: Aerosol size distribution variability near Caribbean trade cumulus clouds—effects of humidity, cloud processing, and implications for spaced-based lidar backscatter measurements
Advisor: Robert M. Rauber

B.S., Chemistry – Magna Cum Laude

University of Puerto Rico at Rio Piedras, P.R., May 2004
Topics: Analytical Chemistry, Organics
Thesis: Size-resolved concentrations of carbonaceous aerosol in marine and urban sites in the island of Puerto Rico
Advisor: Olga L. Mayol Bracero

Endeavor STEM Teaching Certificate in STEM Education

Teachers College of Columbia University, August 2017

Research Experience and Field Work

Worldwide Clouds Intensive Observation Periods through The GLOBE Program

NASA GLOBE Clouds Data Challenges

Spring Clouds Challenge (March 15 – April 15, 2018)

Fall Clouds Challenge (October 15 – November 15, 2019)

Community Clouds Challenge: Science is Better Together (July 15 – August 15, 2020)

Responsibilities: Organize, lead, and execute month-long intensive observation periods. This includes science research question, social media coordination, identification of educational resources, and collaborating with NASA scientists to serve as subject matter experts.

Field Campaign Involvement

RICO (*R*ain *I*n *C*umulus over the *O*cean) 11/2004 – 01/2005

Responsibilities: Understand and review in-situ data collected with the NCAR C-130 making sure that optical particle counters worked properly. Report the number of clouds penetrated with the research aircraft and the altitudes studied.

Graduate Student Visitor Program, Advanced Study Program, National Center for Atmospheric Research; 08/2007 – 12/2007

***Summary*:** Worked with Dr. Jørgen B. Jensen to obtain 1D model results of typical trade wind cumuli observed during the Rain In Cumulus over the Ocean (RICO) campaign using complete particle size distributions obtained from in-situ data collected with the NCAR C-130. This program gave me the opportunity to work hand in hand with Dr. Jensen to understand his particle tracking, collision-coalescence model.

Visiting Graduate Student, Research Aviation Facilities, National Center for Atmospheric Research; 06/2005 – 08/2005

Summary: Collaboration with Dr. Jørgen B. Jensen to process and analyze data obtained during the Rain In Cumulus over the Ocean (RICO) field campaign, with emphasis on giant nuclei particle data from the Giant Nulcei Impactor. The work accomplished during this visit helped me get in contact with scientists that work with optical particle counters which guided me in the better understanding of the data used to obtain a complete particle spectrum.

Undergraduate Research, Dept. of Chemistry, Univ. of Puerto Rico 05/2003 – 05/2004

***Summary*:** Compare concentrations of organic carbon and black carbon in an urban area with a marine environment to obtain percentages of anthropogenic generated carbons. Measurements were obtained and analyzed under the supervision of Prof. Olga L. Mayol-Bracero and PhD candidate Lydia Soto-García.

Education Experience

01/2015-06/2017
Texas State University
Lecturer of Practice – NASA STEM Educator Professional Development Collaborative Specialist
Lead educators within NASA Langley Research Center's 5-state region and nationally into a deeper understanding of NASA's research and missions so that they can confidently and effectively bring NASA content into their classrooms. In support of this effort, I also lead student events where educators can practice NASA content with her support. Deliver STEM professional development sessions digitally as well as face to face in both English and in Spanish to meet the goals, objectives, and strategies of different underserved and underrepresented populations. Assist faculty members from Minority Serving Institutions (MSI) as well as other professional educators from museums, science centers or organizations. Develop and institute strategies to establish and maintain professional contacts with MSI leading practitioners and community educational institutions, such as the Virginia Latino Higher Education Network (VALHEN), the Virginia Air and Space Center (VASC), the National Institute of Aeronautics and the North Carolina Museum of Natural Sciences.

10/2013 – 01/2015
Paragon TEC
NASA Education Specialist
Developed and evaluated goals, objectives, and strategies for educator professional development (EDP) to align to state and national educational guidelines. Contributed to the analysis of NASA inspired STEM activities and evaluated gaps in the correlation to Next Generation Science Standards and Mathematics Common Core State Standards Initiative for NASA Headquarters. Contributed to the evaluation and design of a Massive Open Online Course (MOOC) and accompanying webinars in collaboration with the National Science Teachers Association (NSTA) emphasizing in the implementation of engineering design challenges. Used systems approach to coordinate subject matter experts, tours, and curriculum support during EPD workshops such as the 2014 Modelling and Simulation (MODSIM) workshops with Radford University and Longwood University and the 2014 NASA STEM MANIA: STEM in Sports virtual EPD sessions and student engagement. Delivered student engagement activities at different National Associations for Stock Car Auto Racing (NASCAR) tracks including Richmond International Raceway, Kentucky Speedway and Pocono Raceway by implementing culturally responsive and relevant pedagogical techniques within unusual settings and situations. Developed strategies to establish and maintain professional contacts with leading groups and community supporters, as for example, VALHEN, VASC, the Virginia Science Museum, and the North Carolina Museum of Natural Sciences. Co-led and developed teaching resources for the 2014 National Climate Assessment report focused on the southeast and Caribbean region. Led, organized and co-taught online webinars in Spanish as part of NASA's 2014 Earth Science Week.

03/2013 – 09/2013
Pennsylvania State University
Aerospace Education Specialist with Aerospace Educator Specialist Program (AESP)
Developed and implemented major activities for students and teachers designed to meet STEM educational needs nationwide and within the five-state region, including 2013 Career Days, NASA Educator Workshop in STEM (NEWS), and MODSIM EPD workshops with Radford University and Longwood University. Developed and evaluated goals, objectives, and strategies for EPD to align to state

and national educational guidelines. Used systems approach to develop, organize, and lead EPD workshops like "La NASA en tus manos" workshop for Spanish teachers, "STEM in Spanish Immersion" series, "Little Fingers in STEM" for educators teaching grades K-2, and student engagement activities like Homeschool Day at the Virginia Air and Space Center. Delivered Digital Learning Network modules in English and in Spanish through videoconferencing platforms to students across the nation.

09/2012 – 02/2013 & 05/2010 – 01/2012
Tessada & Associates, Inc
Educator in Residence
Developed and assisted with collaborations and partnerships between NASA and institutions such as Univision Communications, Museum Alliance, and VALHEN to increase the reach of NASA-inspired activities in STEM for student opportunities at museums, out of school and after school programs.

NASA y Tu (NASA and You) responsibilities:
Managed and developed the creation of digital material and website content in English and in Spanish for NASA y Tu (NASA and You) program, an Agency-wide partnership with Univision Communications. Edited and wrote scripts for 30-second videos in Spanish and in English that aired in Univision Networks to inspire and reach underserved and underrepresented students, communities, and educators. Managed the infrastructure and development of NASA y Tu (NASA and You) website with website developers. Recommended edits and segments for digital material for the NASA y Tu (NASA and You) website. Developed strategic collaborations and used systems approach to maintain production of videos, digital materials and website development to meet television network timelines and deadlines. Interviewed subject matter experts in Spanish and in English from NASA's Hispanic community.

06/2012 – 08/2012
University of Virginia
Education Specialist
Managed and developed infrastructure for the 2012 MODSIM two-week workshop for high school math teachers in the state of Virginia. Used systems approach to organize, coordinate, and implement the master schedule, recruit subject matter experts as mentors, specialized speakers, tours, lesson development support, and organization of meals, printing and materials necessary for the workshop.

01/2011 – 05/2011
Virginia Wesleyan College
Adjunct Instructor
Taught Introduction to Meteorology course for science and non-science undergraduate students. Developed teaching material and framework for the course, including digital teaching methods and evaluation. Covered topics such as basics of Earth's atmosphere, structure and dynamics of weather systems and phenomena such as clouds, hurricanes and tornadoes, and taught basic understanding of systems approach to studying Earth's climate and climate system. Course work included weather forecasting, and analysis of weather and global data.

09/2004 – 09/2010
University of Illinois at Urbana-Champaign
Graduate Teaching/Research Assistant
As a Graduate Teaching Assistant:
Instructed science and non-science major students the basic concepts and principles of meteorology in a laboratory setting. Led lectures and demonstrations introducing new material and assisted students through laboratory hands-on exercises. Coordinated, wrote and implemented digital and virtual laboratory exercises as well as exam questions. Led and presented weather briefings, student discussions and in-class activities.

As a Graduate Research Assistant:
Quantified and evaluated complex analyses of data sets to study interactions between aerosols and trade wind cumuli using in-situ data collected with optical array probes flown on the National Center for Atmospheric Research (NCAR) C-130 aircraft during the **R**ain **I**n **C**umulus over the **O**cean (RICO) campaign. Developed and analyzed variations in particle concentrations, size distributions and environmental characteristics to determine the relationship between radiative effects of aerosol and clouds in the Earth's Energy Budget. Developed a one-dimensional cloud model to evaluate the relationship of particle size distributions obtained from in-situ data to particle tracking of collision-coalescence models.

Technical Skills

Proficient in: MATLAB, FORTRAN 77, UNIX, Windows 9x/2000/XP, Compass, Microsoft Office (Excel, PowerPoint, and Word), GARP, NCPlot, NCPP, VIDYO and Adobe Connect.

Languages: Spanish – native speaker/writer, English.