

# MARIA ROSABELLE (“ROSS”) ONG

Ph.D. Candidate

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## EDUCATION

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**M. Phil. Earth and Environmental Sciences**, *Columbia University*, New York, NY, USA, Feb. 2023

**M.A. Earth and Environmental Sciences**, *Columbia University*, New York, NY, USA, Jun. 2021

**B.S. Biology**, *cum laude*, *University of the Philippines Manila*, Manila, Philippines, Oct. 2007

## RESEARCH EXPERIENCE

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Sep. 2019 – present **Ph.D. Candidate**, *Columbia University, Lamont Doherty Earth Observatory, American Museum of Natural History*, New York, NY, USA

Dec. 2015 – Sep. 2019 **Research Assistant**, *Asian School of the Environment / Earth Observatory of Singapore, Nanyang Technological University*, Singapore

## PREVIOUS PROFESSIONAL EXPERIENCE

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2014 – 2015 **Water Quality Analyst**, *Resorts World Sentosa Pte. Ltd.*, Singapore  
2011 – 2014 **Service Manager / Executive**, *CPG FM Pte. Ltd.*, Singapore

## PUBLICATIONS (IN REFEREED JOURNALS)

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Walter, R. M., Sayani, H. R., Felis, T., Cobb, K. M., Abram, N. J., Arzey, A. K., Atwood, A., Brenner, L. D., Dassié, E. P., DeLong, K. L., Ellis, B., Emile-Geay, J., Fischer, M. J., Goodkin, N. F., Hargreaves, J. A., Kilbourne, K. H., Krawczyk, H. A., McKay, N. P., Moore, A. L., Murty, S. A., **Ong, M. R.**, Ramos, R. D., Reed, E. V., Samanta, D., Sanchez, S. C., Zinke, J., and the PAGES CoralHydro2K Project Members (2023). The CoralHydro2K Database: a global, actively curated compilation of coral  $\delta^{18}\text{O}$  and Sr/Ca proxy records of tropical ocean hydrology and temperature for the Common Era. *Earth System Science Data*, 15(5), 2081-2116.  
<https://doi.org/10.5194/essd-15-2081-2023>

**Ong, M. R.**, Goodkin, N. F., Guppy, R., Hughen, K. A. (2022). *Colpophyllia natans* from Tobago, a novel paleoclimate archive for reconstructing sea surface temperatures in the tropical Atlantic. *Paleoceanography and Paleoclimatology*, 37(12), e2022PA004483.  
<https://doi.org/10.1029/2022PA004483>

- Featured and highlighted in a commentary by Thirumalai and Maupin (2023),  
<https://doi.org/10.1029/2023PA004723>

Kaushal, N., Tanzil, J. T. I., Zhou, Y., **Ong, M. R.**, Goodkin, N. F., Martin, P. (2022). Environmental Calibration of Coral Luminescence as a Proxy for Terrigenous Dissolved Organic Carbon Concentration in Tropical Coastal Oceans. *Geochemistry, Geophysics, Geosystems*, 23(10), e2022GC010529. <https://doi.org/10.1029/2022GC010529>

Goodkin, N. F., Samanta, D., Bolton, A., **Ong, M. R.**, Phan, K. H., Vo, S. T., Karnauskas, K. B., Hughen, K. A., (2021). Natural and Anthropogenic Forcing of Multi-decadal to Centennial Scale Variability of Sea Surface Temperature in the South China Sea. *Paleoceanography and Paleoclimatology*, 36(10), e2021PA004233. <https://doi.org/10.1029/2021PA004233>

Goodkin, N. F., Bolton, A., Hughen, K. A., Karnauskas, K. B., Griffin, S., Phan, K. H., Vo, S. T., **Ong, M. R.**, Druffel, E. R. M. (2019). East Asian Monsoon variability since the sixteenth century. *Geophysical Research Letters*, 46(9), 4790-4798. <https://doi.org/10.1029/2019GL081939>

He, S., Goodkin, N. F., Jackisch, D., **Ong, M. R.**, Samanta, D. (2018). Continuous real-time analysis of the isotopic composition of precipitation during tropical rain events: Insights into tropical convection. *Hydrological Processes*. 32(11), 1531-1545. <https://doi.org/10.1002/hyp.11520>

## **PUBLICATIONS (Submitted and In-Preparation)**

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Jung, J., [et al., including **Ong, M. R.**] (*in review*). Equatorial upwelling of phosphorus drives Atlantic N<sub>2</sub> fixation and *Sargassum* blooms. *Nature Geoscience*.

**Ong, M. R.**, Goodkin, N. F., Guppy, R., Hughen, K. A. (*in preparation*). A Coral-based Multiproxy Investigation of Regional Hydroclimate Variability in the Tropical Atlantic since the 1960s.

**Ong, M. R.**, Goodkin, N. F., Guppy, R., Hughen, K. A. (*in preparation*). Coral  $\Delta^{14}\text{C}$  from Tobago Reveals a Possible Shift in Surface Water Circulation in the Tropical North Atlantic since the early 2000s.

## **DATASET CONTRIBUTIONS**

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**Ong, M. R.**, Goodkin, N. F., Guppy, R., Hughen, K. A. (2022). NOAA/WDS Paleoclimatology – Tobago coral Sr/Ca, extension and SST data from 1988-2016 CE [Dataset]. NOAA National Center for Environmental Information. <https://doi.org/10.25921/9xbw-sk21>

## **CONFERENCE PRESENTATIONS / ABSTRACTS (\*Oral Presentation)**

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**Ong, M. R.**, Goodkin, N. F., Guppy, R., Hughen, K. A. Annual Coral  $\Delta^{14}\text{C}$  from Tobago Reveals a Possible Shift in Surface Water Circulation in the Tropical North Atlantic since the early 2000s. *AGU Fall Meeting 2024*. Washington D.C., USA. Dec. 9-13, 2024

**Ong, M. R.**, Goodkin, N. F., Guppy, R., Hughen, K. A. A Coral-based Multiproxy Investigation of Regional Hydroclimate Variability in the Tropical Atlantic since the 1960s. *Ocean Sciences Meeting 2024*. New Orleans, LA, USA. Feb. 18-23, 2024.

Humphries, C., Goodkin, N. F., Brenner, L. D., **Ong, M. R.**, Ramos, R. D. Potential use of coral Ba/Ca off Palau Island, Philippines, as a proxy to study past climate and investigate the impacts of ENSO. *Ocean Sciences Meeting 2024*. New Orleans, LA, USA. Feb. 18-23, 2024.

Goodkin, N. F.\*, Ramos, R. D., Murty, S. A., Samanta, D., Chen, M., Kannad, A., **Ong, M. R.**, and the MarGe Laboratory Group. An Integrated Review of the Climate Driven Variations in the Indo-Pacific using a Multi-Proxy, Multi-Geographical Approach in Scleractinian Corals. *AGU Fall Meeting 2023*. San Francisco, CA, USA. Dec. 11-15, 2023.

**Ong, M. R.**, Goodkin, N. F., Fraser, A. G., Guppy, R., Hughen, K. A. Investigating the Utility of Coral Ba/Ca from Tobago as a Proxy for River Discharge and Regional Hydroclimate Variability in the Tropical Atlantic. *AGU Fall Meeting 2022*. Chicago, IL, USA. Dec. 12-16, 2022.

- Goodkin, N. F., Kannad, A., Yaming, J. R., **Ong, M. R.**, Kilbourne, K. H., Hughen, K. A. Examination of the North Atlantic Oscillation and the Ability to Improve Marine Reconstructions Using Spatially Diverse Coral Records. *AGU Fall Meeting 2022*. Chicago, IL, USA. Dec. 12-16, 2022.
- \***Ong, M. R.**, Goodkin, N. F., Guppy, R., Hughen, K. A. *Colpophyllia natans*, a potential new paleoclimate archive for reconstructing sea surface temperatures in the tropical North Atlantic. *Ocean Sciences Meeting 2022 (Virtual)*. Feb. 24 – Mar. 4, 2022.
- Goodkin, N. F., Samanta, D., Bolton, A., **Ong, M. R.**, Hoang, P. K., Vo, S.T., Karnauskas, K. B., Hughen, K. A. A novel identification of anthropogenic changes in South China Sea seasonal sea surface temperatures over the past 400 years. *Ocean Sciences Meeting 2022 (Virtual)*. Feb. 24 – Mar. 4, 2022.
- \***Ong, M. R.**, Tan, A. S. Y., Gan, M. C., Kho, P., Tanzil, J. T. I., Lee, J. N., Goodkin, N. F. Annual coral  $\delta^{18}\text{O}$  variability from the Singapore-Malay Peninsula reveals impacts from ENSO. *14<sup>th</sup> International Coral Reef Symposium (ICRS)*. Bremen, Germany (Virtual). Jul. 18-23, 2021 (*Abstract accepted and withdrawn*)
- \*Goodkin, N. F., Samanta, D., Hughen, K. A., **Ong, M. R.**, Bolton, A., Karnauskas, K. Vietnam climate experienced multi-decadal variability over the past 400 years and decoupling of seasonal SST with anthropogenic warming. *14<sup>th</sup> International Coral Reef Symposium (ICRS)*. Bremen, Germany (Virtual). Jul. 18-23, 2021
- \***Ong, M. R.**, Reconstructing Long-Term Climate Variability using Slow Growing Brain Corals from the Caribbean. *12<sup>th</sup> Annual RGGS Second Year Student Symposium*. Virtual Presentation. Dec. 10, 2020.
- \***Ong, M. R.**, Reconstructing Long-Term Climate Variability using Slow Growing Brain Corals from the Caribbean. *LDEO First Year Colloquium*. Virtual Presentation. Apr. 17, 2020.
- Ong, M. R.**, Tanzil, J. T. I., Goodkin, N. F. Coral  $\delta^{18}\text{O}$  reconstructs sea surface salinity in the Singapore Straits revealing impacts from ENSO. *MSRDP Mid-term Symposium*. Nanyang University of Singapore, Singapore. Feb. 21-22, 2019.
- Ong, M. R.**, Tanzil, J. T. I., Goodkin, N. F. Coral  $\delta^{18}\text{O}$  reconstructs sea surface salinity in the Singapore Straits revealing impacts from ENSO. *EOS 2019 Scientific Annual Meeting*. Nanyang Technological University, Singapore. Jan. 10-11, 2019
- Ong, M. R.**, Tanzil, J. T. I., Goodkin, N. F. Coral  $\delta^{18}\text{O}$  reconstructs sea surface salinity in the Singapore Straits revealing impacts from ENSO. *AGU Fall Meeting 2018*. Washington D.C., USA. Dec. 10-14, 2018.
- Loke, D, Goodkin, N. F., Bolton, A., **Ong, M. R.** 240-Year record of Sr/Ca and Ba/Ca from a coral off central Vietnam reveals impacts of monsoonal upwelling and La Niña rains. *AGU Fall Meeting 2018*. Washington D.C., USA. Dec. 10-14, 2018.
- \***Ong, M. R.**, Tanzil, J. T. I., Goodkin, N. F. Using coral Sr/Ca and  $\delta^{18}\text{O}$  to track environmental changes in the Singapore Straits. *4<sup>th</sup> Asia Pacific Coral Reef Symposium*. Cebu, Philippines. Jun. 04-08, 2018.
- He, S., Goodkin, N.F., Jackisch, D., **Ong, M. R.** Continuous real-time measurements of  $\delta$ -values of precipitation during rain events: Insights into tropical convection. *AGU Fall Meeting 2017*. New Orleans, LA, USA. Dec. 11-15, 2017.

Jackisch, D., He, S., **Ong, M. R.**, Goodkin, N. F. Continuous and simultaneous measurements of precipitation and vapor isotopes over two monsoon seasons during 2016-2017 in Singapore. *AGU Fall Meeting 2017*. New Orleans, LA, USA. Dec. 11-15, 2017.

Jackisch, D., He, S., **Ong, M. R.**, Goodkin, N. F. Simultaneous measurements of stable isotope composition in precipitation and vapour during NE monsoon in Singapore. *AOGS 14<sup>th</sup> Annual Meeting*. Singapore. Aug. 06-11, 2017.

He, S., Goodkin, N. F., Jackisch, D., **Ong, M. R.** Continuous real-time analysis of isotopic composition of precipitation during tropical rain events using a diffusion sampler. *Advances in Stable Isotope Techniques and Applications Conference*. Canada. June 2017.

## INVITED PRESENTATIONS AND LECTURES (\*Oral Presentation)

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\***Ong, M. R.**, Untapping a New Climate Archive: *Colpophyllia natans* Climate Reconstructions in the Tropical Atlantic. *University of New Mexico – Center for Stable Isotopes Brown Bag Seminar*. Virtual Presentation. April 03, 2023.

\***Ong, M. R.**, Decolonizing Paleontology: A Case Study. *Seminar in Race, Climate Change, Environmental Justice: On Geology's Colonial Legacies (Spring 2023)*. Guest Lecture. Feb. 16, 2023.

\***Ong, M. R.**, Corals and Climate Change. *Lerner Gray Committee Meeting*. Virtual Presentation. May 05, 2020.

\***Ong, M. R.**, Ramos, R. D., Corals as archives of past climate. *National Marine Biology and Museum and Aquarium, Checheng, Pingtung, Taiwan, R.O.C.*, Sep. 2017

## HONORS AND AWARDS

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2023	<b>Sydney Anderson Travel Award</b> , <i>Richard Gilder Graduate School, American Museum of Natural History</i> . (\$2,500)
2020 – 2021	<b>Kenneth and Linda Ciriacks Graduate Fellowship in Earth and Environmental Sciences</b> , <i>Columbia University (GSAS)</i> .
2019	<b>Lerner-Gray Fund for Marine Research</b> , <i>American Museum of Natural History</i> .
2019	<b>Richard Gilder Graduate School Graduate Fellow</b> , <i>American Museum of Natural History</i> .
2019	<b>Dean's Fellow</b> , <i>Department of Earth and Environmental Sciences, Columbia University</i> .

## RESEARCH GRANTS AWARDED

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01/2023-12/2024	Goodkin, N. F. (Lead PI) and <b>Ong, M. R.</b> (Co-PI). Reconstructing Florida Current transport to better understand Atlantic Meridional Overturning Circulation (AMOC) behavior in a warming world. <i>LDEO – The Climate Center</i> . \$12,000.
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## ACADEMIC SERVICE, SCIENTIFIC AND EDUCATIONAL OUTREACH

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2022 – present	<b>Journal Reviewer.</b> AGU <i>Geochemistry, Geophysics, Geosystems</i> , AGU <i>Paleoceanography and Paleoclimatology</i> , Association for the Sciences of Limnology and Oceanography (ASLO), <i>Limnology and Oceanography: Methods</i>
Fall 2024	<b>Mentor.</b> DEES Application Mentorship Program. Columbia University
Jun. 2023	<b>Guest Reviewer / Judge.</b> Billion Oyster Project's 9 <sup>th</sup> Annual Student Symposium, Billion Oyster Project. New York Harbor School, Governor's Island, New York, NY.
Apr. 2021	<b>Chat Moderator.</b> <i>Frontiers Lecture: Unlocking Climate Data in Corals</i> . AMNH EarthFest Online. Livestream on Zoom.
Apr. 2021	<b>Chat Moderator.</b> <i>Astronomy Online: From Sun to Sea Life</i> . AMNH EarthFest Online. Livestream on Zoom.
Aug. 2020	<b>Speaker.</b> <i>Corals and Climate Change</i> . American Museum of Natural History (AMNH) Learn with Me Online Program. Livestream on YouTube.
Summer 2020	<b>Volunteer.</b> Lamont Summer Mentorship Program, Columbia University.
Apr. 2020	<b>Participant.</b> <i>Rotunda Magazine</i> . Featured in article (for field work done in Trinidad and Tobago funded by the Niarchos Foundation).

## TEACHING EXPERIENCE

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Spring 2022	<b>Teaching Assistant.</b> Chemistry of Continental Waters, <i>Columbia University</i>
Spring 2021	<b>Teaching Assistant.</b> Earth's Oceans and Atmosphere, <i>Columbia University</i>

## FIELD EXPERIENCE

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Jul. 2023	<b>Participant.</b> Coral core collection. Fort Lauderdale, Florida, <i>USA</i> .
Oct. 2019	<b>Participant.</b> Coral core collection. Speyside and St. Giles Island, <i>Trinidad and Tobago</i> .
2016 – 2019	<b>Participant.</b> Coral core collection and water sampling. Southern Islands, <i>Singapore Straits</i> .

## PROFESSIONAL DEVELOPMENT / WORKSHOPS / CONFERENCES BY APPLICATION

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Jan. 29-31, 2025	<i>Marine Data for Ocean Health 2025</i> . Copernicus Marine Team (Virtual).
Dec. 8, 2024	<i>Python for Satellite Remote Sensing: Analysis and Visualization for Earth Scientist</i> . AGU Fall Meeting 2024, Washington D.C.
Dec. 8, 2024	<i>Introduction to Radiocarbon: Theory and Best Practices for Ocean and Earth Sciences</i> . AGU Fall Meeting 2024, Washington D.C.

Aug. 21-23, 2023	<i>Paleo Data Assimilation Workshop</i> . Northern Arizona University (Virtual).
Jun. 5-8, 2023	<i>Teaching Development Program Sprint – Foundational Track</i> . Center for Teaching and Learning (CTL), Columbia University.
Dec. 11, 2022	<i>Introducing the Community Earth System Model (CESM2)</i> via an Interactive Hands-on Tutorial. AGU Fall Meeting 2022, Chicago, IL
Jun. 20–Jul. 01, 2022	<i>ISOCAMP 2022</i> . University of New Mexico – Center for Stable Isotopes.

## PROFESSIONAL AFFILIATIONS / MEMBERSHIPS

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2018 – Present	<b>Member</b> , American Geophysical Union
2020 – Present	<b>Member</b> , International Coral Reef Society
2022 – Present	<b>Member</b> , The Oceanography Society
Mar. 2018 – Present	<b>Rescue Diver</b> , Professional Association of Diving Instructors (PADI).
Sep. 2019 – Present	<b>Diving First Aid for the Professional Diver Provider</b> , DAN.

## LABORATORY SKILLS

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Experienced in chemical analysis using: (1) ThermoFisher iCAP 6000/7400 Inductively Coupled Plasma Optical Emission Spectrometer (ICP-OES), (2) Kiel IV Carbonate Device, (3) Thermo MAT 253/+ mass spectrometer, (4) Thermo Finnigan Gas Bench II, (5) Delta V Isotope Ratio Mass Spectrometer and (6) Picarro Diffusion Sampler – Cavity Ring-Down Spectrometer.

## COMPUTER SKILLS

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Knowledge in using Python, MATLAB, Kaleidagraph, QGIS 3, and OceanDataView (ODV). Proficient in Microsoft Office Suite, Adobe Photoshop, QAnalyseries, Datagraph. Well-versed in both MAC OS and Windows OS platforms.

## STUDENTS SUPERVISED

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**Kyle Chang** (BSc, Science Volunteer, AMNH, New York, NY, USA, Fall 2024 – Spring 2025)  
**Cate Humphries** (BSc, Barnard College, New York, NY, USA, Summer 2023 – Spring 2024)  
**Rosy Arora** (BSc, Georgetown University, Washington D.C. USA, Summer 2022, Summer Intern)  
**Alexandra G. Fraser** (BSc, Bard College, New York, USA, Summer 2022, NSF REU Summer Internship Program at AMNH)  
**Adam Vasquez** (BSc, Vassar College, New York, USA, Summer 2022, NSF REU Summer Internship Program at AMNH)  
**Ong Chai Kee** (MSc, Universiti Malaysia Terengganu, Malaysia, Summer AY 2017-2018)  
**Syamil Sahar** (MSc, Universiti Malaysia Sarawak, Malaysia, 2<sup>nd</sup> Sem AY 2017-2018, AY 2018-2019)  
**Tiffany Lee Wan Qi** (BSc, Nanyang Technological University, Singapore, 2<sup>nd</sup> Sem, AY 2017-2018)  
**Deborah Loke Wai Yee** (BSc, Nanyang Technological University, Singapore, Final Year Undergraduate Student, AY 2017-2018)  
**Wanling Goh** (Student Intern, Singapore American School, Singapore Summer Internship, AY 2016-2017)  
**Revadi Devi Thyartan** (MSc, Swinburne University of Technology, Malaysia, AY 2016-2017)  
**Aloysius Teng Min Ren** (BSc, National University of Singapore, Singapore, Undergraduate Summer & Fall Internship, AY 2015-2016)  
**Gan Min Chong** (MSc, Universiti Malaysia Terengganu, Malaysia, 2<sup>nd</sup> Sem AY 2015-2016)