

## Associate Professor Marius Nils Müller

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PhD. Supervisor

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### Academic Qualification:

**PhD in Marine Biogeochemistry**, GEOMAR Helmholtz Centre for Ocean Research Kiel, University of Kiel, Germany.

**Diplom/Master in Biology**, University of Kiel, Germany.

### Teaching Area

Environmental Microbiology.

### Research Area

Marine Biogeochemistry, Microbial Ecology, Bioremediation, Climate Change, Biomineralization, System Biology, Algal Cultivation.

### Working Experience

Associate Prof., Macao Environmental Research Institute, MUST, Macao (2023 - ).

Consultancy for UNESCO: Formation of human resources on climate change mitigation and adaptation strategies (2023).

Visiting Prof. (adjunct level), Department of Oceanography, Federal University of Pernambuco, Brazil (2018 - 2022).

Post-Doc, Oceanographic Institute, University of São Paulo, Brazil (2014 - 2017).

Post-Doc, Institute for Marine and Antarctic Studies, University of Tasmania, Australia (2011 - 2014).

Research Assistant, GEOMAR Helmholtz Centre for Ocean Research Kiel, Germany (2010 - 2011).

Post-Doc, Villefranche Laboratory of Oceanography, France (2009 - 2010).

### Research Grants

Impacts of crude oil on the biological communities of coastal ecosystems of Pernambuco, CNPq/MCTI, Brazil. (2021 - 2024).

Impacts of crude oil spill on coastal ecosystems at the coast of Pernambuco, FACEPE, Brazil. (2019 -2022).

Monitoring crude oil in water and its impacts on the food web at the coast of Pernambuco, FACEPE, Brazil (2019 - 2022).

Survival of the fittest: Ocean acidification sets the pace for Brazilian microalgae, CNPq, Brazil, PI (2011 - 2014).

Effects of ocean acidification on marine microbes in the Southern Ocean, AAP, Australia, Declined (2013).

Institutional equipment grant, University of Tasmania, Australia (2011).

Long-term response of phytoplankton on climate change, subproject, BMBF, Germany, PI - declined (2009).

### Representative publications (Complete publication refer to my webpage)

#### Peer-reviewed publications:

Oliveira C. Y. B., Brandão B. C. S., Jannuzzi L. G. S., Oliveira D. W. S., Yogui G. T., **Müller M. N.** and Gálvez A. O. (2023) New insights on the role of nitrogen in the resistance to environmental stress in an endosymbiotic dinoflagellate. *Environmental Science and Pollution Research*, 30, 82142-82151.

Molony B. W., Ford A. T., Sequeira A. M. M., Borja A., Zivian A. M., Robinson C., Lonborg C., Escobar-Briones E. G., Di Lorenzo E., Andersen J. H., **Müller M. N.**, Devlin M. J., Failler P., Villasante S., Libralato S. and Fortibuoni T. (2022) Editorial: Sustainable Development Goal 14 - Life Below Water: Towards a Sustainable Ocean. *Frontiers in Marine Science*, 8, 829610.

Botana M. T., Chaves-Filho A. B., Inague A., Guth A., Saldanha-Correa F., **Müller M. N.**, Sumida P. Y. G., Mizamoto S., Kellermann M. Y., Valentine R. C. and Yoshinaga M. Y. (2022) Thermal plasticity of coral reef symbionts is linked to major alterations in their lipidome composition. *Limnology and Oceanography*, 67, 1456-1469.

Oliveira C. Y. B., Abreu J. L., Santos E. P., Matos A. P., Tribuzi G., Oliveira C. D. L., Veras B. O., Bezerra R. S., **Müller M. N.** and Galvez A. O. (2022) Light induces peridinin and docosahexaenoic acid accumulation in the dinoflagellate *Durusdinium glynnii*. *Applied Microbiology and Biotechnology*, 106, 10.1007/s00253.

**Müller M. N.**, Blanco-Ameijeiras S., Stoll H. M., Mendez-Vicente A. and Lebrato M. (2021) Temperature Induced Physiological Reaction Norms of the Coccolithophore *Gephyrocapsa oceanica* and Resulting Coccolith Sr/Ca and Mg/Ca Ratios. *Frontiers in Earth Science*, 9, 582521.

**Müller M. N.**, Yogui G. T., Galvez A. O., Jannuzzi L. G. S., Filho J. F. S., Montes M. J. F., Melo P. A. M. C., Neumann-Leitao S. and Zanardi-Lamardo E. (2021) Cellular accumulation of crude oil compounds reduces the competitive fitness of the coral symbiont *Symbiodinium glynnii*. *Environmental Pollution*, 289,

Alvares da Silva O. and **Müller M. N.** (2021) Humboldtian shortfalls na geobiodiversidade marinha: os planos de acao nacional para a conservacao de especies ameacadas de extincao podem reduzir as suas causas? *Humboldt - Revista de Geografia Fisica e Meio Ambiente*, 1(3), e62663.

**Müller M. N.**, Brandini F. P., Trull T. W. and Hallegraeff G. M. (2020) Coccolith volume of the Southern Ocean coccolithophore *Emiliana huxleyi* as a possible indicator for palaeo-cell volume. *Geobiology*, doi:10.1111/GBI.12414.

**Müller M. N.**, Mardones J. and Dorantes-Aranda J.J. (2020) Editorial: Harmful Algal Blooms(HABs) in Latin America. *Frontiers in Marine Science*, 7:34.doi: 10.3389/fmars.2020.00034.

Lebrato M., Garbe-Schonberg D., **Müller M. N.** et al. (2020) Global variability in seawater Mg:Ca and Sr:Ca ratios in the modern ocean. *Proceedings of the National Academy of Sciences of the United States of America*, 117, 22281- 22292, doi:10.1073/pnas.1918943117.

**Müller M. N.** (2019) On the Genesis and Function of Coccolithophore Calcification. *Frontiers in Marine Science*, 6:49, doi: 10.3389/fmars.2019.00049.

**Müller M. N.**, Dorantes-Aranda J. J., Seger A., Botana M., Brandini F. P. and Hallegraeff G. M. (2019) Ichthyotoxicity of the Dinoflagellate *Karlodinium veneficum* in Response to Changes in Seawater pH. *Frontiers in Marine Science*, 6:82, doi:10.3389/fmars.2019.00082.

**Müller M. N.**, Krabbenhoft A., Vollstaedt H., Brandini F. and Eisenhauer A. (2018) Stable isotope fractionation of strontium in coccolithophore calcite: influence of temperature and carbonate chemistry. *Geobiology*, 16, 297-306, doi: 10.1111/gbi.12276.

Castrisios K., Martin A., **Müller M. N.**, Fraser K., McMinn A. and Ryan K. G. (2018) The response of Antarctic sea-ice algae to an experimental decrease in pH: a preliminary analysis from chlorophyll fluorescence imaging of melting ice. *Polar Research*, 37:1, 1438696, doi: 10.1080/17518369.2018.1438696.

**Müller M. N.**, Krabbenhoft A., Vollstaedt H., Brandini F. P. and Eisenhauer A. (2018) Stable isotope fractionation of strontium in coccolithophore calcite: influence of temperature and carbonate chemistry. *Geobiology*, 16(3), 297-306, doi:10.1111/gbi.12276.

Barcelos e Ramos J., Schulz K. G., Voss M., Narciso Á., **Müller M. N.**, Reis F. V., Cachão M. and Azevedo E. B. (2017) Nutrient-specific responses of an oligotrophic natural phytoplankton community. *Journal of Plankton Research*, 39(4), 744-761, doi:10.1093/plankt/fbx025.

**Müller M. N.**, Trull T. W. and Hallegraeff G. M. (2017) Independence of carbonate chemistry and nutrient limitation impacts on the Southern Ocean coccolithophore *Emiliana huxleyi*. *The ISME Journal*, 11, 1777-1787, doi:10.1038/ismej.2017.53.

McMinn A., **Müller M. N.**, Martin A., Ugalde S., Lee S., Castrisios K. and Ryan K. G. (2017) Effects of CO<sub>2</sub> concentration on a late summer surface sea ice community. *Marine Biology*, 164:87, doi:10.1007/s00227-017-3102-4.

Mardones J. I., **Müller M. N.** and Hallegraeff G. M. (2016) Toxic dinoflagellate blooms of *Alexandrium catenella* in Chilean fjords: a resilient winner from climate change. *ICES Journal of Marine Science*, doi:10.1093/icesjms/fsw164.

Blanco-Ameijeiras S., Lebrato M., Stoll H. M., Iglesias-Rodriguez D., **Müller M. N.**, Mendez-Vicente A. and Oschlies A. (2016) Phenotypic variability in the coccolithophore *Emiliana huxleyi*. *PlosOne*, 11(6),

**Müller M. N.**, Trull T. W. and Hallegraeff G. M. (2016) Corrigendum to "Differing responses of three Southern Ocean *Emiliana huxleyi* ecotypes to changing seawater carbonate chemistry". *Marine Ecology Progress Series*, 551, 283-284.

Li Y., **Müller M. N.**, Paull B. and Nesterenko P. N. (2016) Precise and fast determination of inorganic magnesium in coccolithophore calcite. *Chemical Geology*, 437, 1-6.

Kerr R., da Cunha L. C., Kikuchi R. K. P., Horta P., Ito R. G., **Müller M. N.**, Orselli I. B. M., Lencina-Avila J. M., de Orte M. R., Sordo L., Pinheiro B. R., Bonou F. K., Schubert N., Bergstrom E., and Copertino M. S. (2015) The western South Atlantic Ocean in a high-CO<sub>2</sub> world: current measurement capabilities and perspectives. *Environmental Management*, DOI: 10.1007/s00267-015-0630-x.

**Müller M. N.**, Barcelos e Ramos J., Schulz K. G., Riebesell U., Gallo F., Mackinder L., Kaźmierczak J., Li Y., Nesterenko P. N., Trull T. W. and Hallegraeff G. M. (2015) Phytoplankton calcification as an effective mechanism to alleviate cellular calcium poisoning. *Biogeosciences*, 12, 6493-6501.

- Müller M. N.**, Trull T. W. and Hallegraeff G. M. (2015) Differing responses of three Southern Ocean *Emiliana huxleyi* ecotypes to changing seawater carbonate chemistry. *Marine Ecology Progress Series*, 531, 81-90.
- Seger A., Dorantes-Aranda J. J., **Müller M. N.**, Body A., Peristyy A., Place A. R., Park T. G. and Hallegraeff G. M. (2015) Mitigating fish-killing *Prymnesium parvum* algal blooms in aquaculture ponds with clay: the importance of pH and clay type. *Journal of Marine Science and Engineering*, 3, 154-174.
- Li Y., Paull B., **Müller M. N.** and Nesterenko P. N. (2015) Determination of trace magnesium and strontium in calcium carbonate and calcareous skeletons of marine planktonic organisms using high performance chelation ion chromatography. *Analytical Methods*, 7, 416-422.
- Müller M. N.**, Lebrato M., Riebesell U., Barcelos e Ramos J., Schulz K. G., Blanco-Ameijeiras S., Sett S., Eisenhauer A. and Stoll H. M. (2014) Influence of temperature and CO<sub>2</sub> on the strontium and magnesium composition of coccolithophore calcite. *Biogeosciences*, 11, 1065-1075.
- McMinn A., **Müller M. N.**, Martin, A. and Ryan K. G. (2014) The response of Antarctic sea ice algae to changes in pH and CO<sub>2</sub>. *PLoS One*, 9(1):e86984. doi:10.1371/journal.pone.0086984.
- Müller M. N.**, Beaufort L., Bernard O., Pedrotti M. L., Talec A. and Sciandra A. (2012) Influence of CO<sub>2</sub> and nitrogen limitation on the coccolith volume of *Emiliana huxleyi* (Haptophyta). *Biogeosciences*, 9, 4155-
- Blanco-Ameijeiras S., Lebrato M., Stoll H. M., Iglesias-Rodriguez M. D., Méndez-Vicente A., Sett S., **Müller M. N.**, Oschlies A. and Schulz K. G. (2012) Removal of organic magnesium in coccolithophore calcite. *Geochimica et Cosmochimica Acta*, 89, 226-239.
- Müller M. N.**, Kisakürek B., Buhl D., Eisenhauer A., Gutperlet R., Kolevica A., Riebesell U. and Stoll H. (2011) Response of the coccolithophores *Emiliana huxleyi* and *Coccolithus braarudii* to changing seawater Mg<sup>2+</sup> and Ca<sup>2+</sup> concentrations: Mg<sup>2+</sup>, Sr<sup>2+</sup> incorporation and  $\delta^{44}/^{40}\text{Ca}$ ,  $\delta^{26}/^{24}\text{Mg}$  in calcite. *Geochimica et Cosmochimica Acta*, 75, 2088-2102.
- Krabbenhöft A., Eisenhauer A., Böhm F., Vollstaedt H., Fietzke J., Liebetrau V., Augustin N., Peucker-Ehrenbrink B., Horn C., Hansen B. T., Nolte N., **Müller M. N.** and Wallmann K. (2011) Constraining the Marine Sr Budget from Natural Strontium Isotope Fractionation ( $^{87}\text{Sr}/^{86}\text{Sr}^*/\delta^{88}/^{86}\text{Sr}$ ) of Carbonates, Hydrothermal Solutions and River Waters. *Geochimica et Cosmochimica Acta*, 74, 4097-4109.
- Müller M. N.**, Schulz K. G. and Riebesell U. (2010) Effects of long-term high CO<sub>2</sub> exposure on two species of coccolithophores. *Biogeosciences*, 7, 1109-1116.
- Barcelos e Ramos J., **Müller M. N.** and Riebesell U. (2010) Short-term response of the coccolithophore *Emiliana huxleyi* to abrupt changes in seawater carbon dioxide concentrations. *Biogeosciences*, 7, 177-186.
- Kisakürek B., Niedermayr A., **Müller M. N.**, Taubner I., Eisenhauer A., Dietzel M., Buhl D., Fietzke J. and Erez J. (2009) Magnesium isotope fractionation in inorganic and biogenic calcite. *Geochimica et Cosmochimica Acta*, 73, p. A663.
- Müller M. N.**, Antia A. N. and LaRoche J. (2008) Influence of cell cycle phase on calcification in the coccolithophore *Emiliana huxleyi*. *Limnology and Oceanography*, 53(2): 506-512.
- Schulz K. G., Riebesell U., Bellerby R. G. J., Biswas H., Meyerhöfer M., **Müller M. N.**, Egge J. K., Nejstgaard J. C., Neill C., Wohlers J., and Zöllner E. (2008) Build-up and decline of organic matter during PeECE III. *Biogeosciences*, 5, 707-718.

### **Books/Chapters:**

Lorenzo E., Lonborg C., Anderson J. H., ..., **Müller M. N.**, ..., Failer P.: Sustainable Development Goal 14 - Life Below Water: Towards a Sustainable Ocean. 1. ed. Lausanne: Frontiers Media SA., 2022.

**Müller M. N.**, Mardones J. I., Dorantes-Aranda J. J.: Harmful Algal Blooms (HABs) in Latin America. 1. ed. Lausanne: Frontiers Media SA., 2020.

Melo P. A. M. C., Otsuka A. Y., Grego C. K. S., ..., **Müller M. N.**, ..., Cunha M. G. G. S.: Fitoplâncton marinho tropical. In: Viana, Oliveira, Hazin, Souza. (Org.). CIÊNCIAS DO MAR: dos oceanos do mundo ao Nordeste do Brasil. 1ed.Olinda: Danielle de Lima Viana, 2021, 2, 42-65.

Howard W. R., Nash M., Anthony K., Schmitter K., Bostock H., ..., **Müller M. N.**, ... and Williamson J.: Ocean acidification. In: A Marine Climate Change Impacts and Adaptation Report Card for Australia 2012 (Eds. E.S. Poloczanska, A.J. Hobday and A.J. Richardson).

### **Professional Certification and Awards**

Productive Researcher Scholarship, CNPq, Brazil (2021).

Visiting Research Scholarship, University of Tasmania, Australia (2016).

Selected Participant of the Intercontinental Academia, University Based Institutes for Advanced Studies (2015).

Young Talent Award - Level A, CAPES/CNPq, Brazil (2014).

Young Scientists' Outstanding Poster Paper Award, European Geosciences Union (2006).

### **Journal Editorship**

Frontiers in Marine Science, Special Section Marine Biogeochemistry (2017 - ).

### **Personal Website**

<https://scholar.google.com.br/citations?user=NRNgy7YAAAAJ&hl=en>