NICOLAS CASSAR

Division of Earth and Climate Sciences
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Lab website

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A. PROFESSIONAL PREPARATION

Post-Doctorate, Geosciences, Princeton University (2004-2007; Advisor: Michael Bender)
Ph.D., Oceanography, University of Hawaii (1998-2003; Advisor: Edward Laws)
B.S., McGill University (1994-1997)

B. APPOINTMENTS

Professor (2019-present), Duke University
Associate Professor (2014-2018), Duke University
Assistant Professor (2010-2013), Duke University

International Chair of Excellence - LabexMER at IUEM (2016-present)
Secondary Appointments at Duke Marine Lab and Duke Kunshan University
Professeur Invité (Spring 2014), Université Pierre et Marie Curie, Sorbonne University
Visiting Associate (Winter 2014), California Institute of Technology
Associate Research Scholar (2007-2009), Princeton University
Post-Doctorate Research Associate (2004-2007), Princeton University
Graduate Teaching Assistant (2001-2003), University of Hawaii
Graduate Research Assistant (1998-2003), University of Hawaii
Research Assistant (1997-1998), University of Nice Sophia Antipolis

C. HONORS, AWARDS & FELLOWSHIPS, SCHOLARSHIPS

2023 US National Academy of Sciences Kavli Fellow

2019 PECASE (Presidential Early Career Award for Scientists and Engineers)

2019 Thomas Langford Lectureship Award, Duke University

2016 International Chair of Excellence (LabexMER at European Institute for Marine Studies)

2014 NSF CAREER Award

2012-2014 Alfred P. Sloan Research Fellow

Tyge Christensen Prize awarded by the International Phycological Society (Best paper of the year published in *Phycologia* in 2007: Cassar, N. & Laws, E. A. 2007).

Faculty of 1000 Biology recommended Cassar N et al *Science* 2007 Aug 24 317 (5841):1067-70 http://www.f1000biology.com/article/id/1089617/evaluation

AGU Editor's Choice: Major contribution to biogeosciences: Cassar et al GBC 2004.

2009 Ernest Frohlich Fellow, CSIRO Marine and Atmospheric Research, Australia.

FQRNT Postdoctoral Research Fellowship (2006) *(Fonds Québécois de la Recherche sur la Nature et les Technologies).*

NSERC PGS-B scholarship (2001) (*National Sciences and Engineering Research Council of Canada*) awarded for study abroad.

STAR scholarship (2001), University of Hawaii, Oceanography Department (Student Travel for Achievement in Research).

NSERC PGS-A scholarship (1999) awarded for study abroad.

Watumull scholarship (1999) Oceanography Department, University of Hawaii.

NSERC PGS-A scholarship (1998) awarded but declined (only valid for studies in Canada).

FCAR scholarship (1998) (*Fonds pour la Formation de Chercheurs et l'Aide à la Recherche*) awarded for graduate studies.

Golden Key International Honour Society (1997) (McGill University division).

New-Generation Polar Research Symposium (NGPR-IPY) Invited Participant, 2008.

Dissertations Symposium on Chemical Oceanography XVIII Invited Participant, 2003.

D. PUBLICATIONS

Meyer, M. G., Brzezinski, M. A., Cohn, M. R., Kramer, S. J., Paul, N., Sharpe, G., Niebergall, A. K., Gifford, S., Cassar, N., Marchetti, A. Primary production dynamics during the decline phase of the North Atlantic annual spring bloom. *Submitted.*

Shao et al. Version two of the global oceanic diazotroph database. *In review in Earth System Science Data.*

Gray et al. The Impact of Gulf Stream Frontal Eddies on Ecology and Biogeochemistry near Cape Hatteras. *Submitted.*

Gittings, J. A., Tang, W., Dall'Olmo, G., Jebri, F., Llort, J., Darmaraki, S., Theodorou, I., Brewin, R. J., Srokoz, M., Cassar, N., Raitsos, D. Ocean fertility is enhanced by desertification. *Submitted.*

Lombard et al. et al. 2023. Open science resources from the Tara Pacific expedition across coral reef and surface ocean ecosystems. *Scientific Data, https://doi.org/10.1038/s41597-022-01757-w.*

Gu, S., Lin, Y., Berthelot, H., Tang, W., Robidart, J., Eren A. M., Ducklow, H. W., Cassar, N. Sedimentary diazotroph contribution to measurable N_2 fixation in Antarctic waters. *In review.*

Niebergall, A., Traylor, S. Huang, Y., Feen, M., Meyer, M. G., McNair, H. M., Nicholson, D., Fassbender, A. J., Omand, M. M., Marchetti, A., Menden-Deuer, S., Tang, W., Gong, W., Tortell, P., Hamme, R., Cassar, N. Evaluation of new and net community production estimates by multiple ship-based and autonomous observations in the Northeast Pacific Ocean. *In review.*

Gu, Y., Katul, G. G., Cassar, N. 2023. Multiscale temporal variability of the global air-sea CO_2 flux anomaly. *JGR Biogeosciences, https://doi.org/10.1029/2022JG006934.*

Huang, Y., Eveleth, R., Nicholson, D., Cassar, N. 2022. Can we estimate net biological O_2 flux from total dissolved O_2? *Global Biogeochemical Cycles, http://doi.org/10.1029/2021GB007145.*

Meyer, M. G., Gong, W., Kafrissen, S., Torano, O., Varela, D., Fassbender, A., Santoro, A., Cassar, N., Gifford, S., Niebergall, A., Sharpe, G., Marchetti, A. 2022. Phytoplankton size-class contributions to new and regenerated production during the EXPORTS Northeast Pacific Ocean field deployment. *Elementa, https://doi.org/10.1525/elementa.2021.00068.*

Huang, Y. Tagliabue, A., Cassar, N. 2022. Data-driven modeling of dissolved iron in the global ocean. *Frontiers in Marine Science, https://doi.org/10.3389/fmars.2022.837183.*

Landwehr, S. et al. 2021. Biogeochemistry and physics of the Southern Ocean ocean-atmosphere system explored with data science. *Earth System Dynamics, 12, 1295–1369.*

Cassar, N., Nicholson, D., Khatiwala, S., Cliff, E. 2021. Decomposing the oxygen signal in the ocean interior: Beyond decomposing organic matter. *Geophysical Research Letters, https://doi.org/10.1029/2021GL092621.*

Li, Z., Lozier, M. S, Cassar, N. 2021. Linking Southern Ocean mixed layer dynamics to net community production on intra-seasonal, seasonal, interannual, and multi-year timescales. *Journal of Geophysical Research - Oceans, https://doi.org/10.1029/2021JC017537.*

Tang, W., Llort, J. Weis, J., Basart, S., Li, Z., Sathyendranath, S., Jackson, T., Perron, M. G., Sanz Rodriguez, E., Proemse, B., Bowie, A. R., Schallenberg, C., Strutton, P. G., Matear, R., Cassar, N. 2021. Widespread phytoplankton blooms triggered by 2019-2020 Australian wildfires. *Nature, doi: 10.1038/s41586-021-03805-8.*

Lin, Y., Moreno, C., Marchetti, A., Ducklow, H. Schofield, O., Delage, E., Meredith, M., Eveillard, D., Chaffron, S., Cassar, N. 2021. Decline in plankton diversity and carbon flux with reduced sea ice extent along the Western Antarctic Peninsula. *Nature Communications, https://doi.org/10.1038/s41467-021-25235-w.*

Berthelot, H., Duhamel, S., L'Helguen, S., Maguer, J.-F., Cassar, N. 2021. Inorganic and organic carbon and nitrogen uptake strategies of picoplankton groups in the northwestern Atlantic Ocean. *Limnology and Oceanography, https://doi.org/10.1002/lno.11909.*

Siegel et al. 2021. "Overview of the EXport Processes in the Ocean from RemoTe Sensing (EXPORTS) Northeast Pacific Field Deployment". *Elementa, https://doi.org/10.1525/elementa.2020.00107.*

Brown, M. S., Bowman, J. S., Lin, Y., Feehan, C. J., Moreno, C. M., Cassar, N, Marchetti, A. Schofield, O. M. 2021. Low Diversity of a Key Phytoplankton Group along the West Antarctic Peninsula. Limnology and Oceanography, https://doi.org/10.1002/lno.11765.

Gu, Y., Katul, G. G., Cassar, N. 2021. Mesoscale temporal wind variability biases global air-sea CO_2 gas transfer velocity. *Remote Sensing, 13(7), 1328: https://doi.org/10.3390/rs13071328.*

Wang, S., Tang, W., Delage, E., Gifford, S., Whitby, H., Gonzalez, A. G., Eveillard, D., Planquette, H., Cassar, N. 2021. Investigating the microbial ecology of coastal hotspots of marine nitrogen fixation in the western North Atlantic. *Scientific Reports, https://doi.org/10.1038/s41598-021-84969-1.*

Gu, Y., Katul, G. G., Cassar, N. 2021. The intensifying role of high wind speeds on air-sea carbon dioxide exchange. *Geophysical Research Letters, https://doi.org/10.1029/2020GL090713.*

Huang, Y., Nicholson, D., Huang, B. Cassar, N. 2021. Global estimates of marine gross primary production based on machine-learning upscaling of field observations. *Global Biogeochemical Cycles, https://doi.org/10.1029/2020GB006718.*

Landwehr, S., Thurnherr, I., Cassar, N., Gysel-Beer, M., Schmale, J. 2020. Using global reanalysis data to quantify and correct airflow distortion bias in shipborne wind speed measurements. *Atmospheric Measurement Techniques, 13, 3487–3506.*

Tang, W., Garcia, E., Berthelot, H., Polyviou, D., Wang, S., Baylay, A., Whitby, H., Planquette, H., Mowlem, M., Robidart, J., Cassar, N. 2020. New insights into the distributions of nitrogen fixation and diazotrophs revealed by high-resolution sensing and sampling methods. *The ISME Journal*, https://doi.org/10.1038/s41396-019-0489-6.

Kranz, S. A., Wang, S., Kelly, T. B., Stukel, M. R., Goericke, R., Landry, M. R., Cassar, N. 2020. Lagrangian studies of marine production: a multi-method assessment of productivity relationships in the California Current Ecosystem upwelling region. *JGR-Oceans, https://doi.org/10.1029/2019JC015984.*

Wang, S., Kranz, S. A., Kelly, T. B., Song, H., Stukel, M. R., Cassar, N. 2020. Lagrangian studies of net community production: assessing the effect of diel and multi-day non-steady state factors and vertical fluxes. *JGR-Biogeosciences, https://doi.org/10.1029/2019JG005569.*

Whitby, H., Planquette, H., Cassar, N., Bucciarelli, E., Osburn, C. L., Janssen, D. J., Cullen, J. T., González, A. G., Völker, C., Sarthou, G. 2020. A call for refining the role of humic-like substances in the oceanic iron cycle. *Scientific Reports, https://doi.org/10.1038/s41598-020-62266-7.*

Gorsky et al. 2019. Expanding *Tara* Oceans protocols for underway, ecosystematic sampling of the ocean-atmosphere interface during *Tara* Pacific expeditions. *Frontiers in Marine Science, doi: 10.3389/fmars.2019.00750.*

Tang, W. & Cassar, N. 2019. Data-driven modeling of the distribution of diazotrophs in the global ocean. *Geophysical Research Letters, doi: 10.1029/2019GL084376.*

Lorrain, A., Pethybridge, H., Cassar, N. et al. 2019. Decadal changes in tuna carbon isotopes provide a window into broad-scale changes at the base of pelagic food webs. *Global Change Biology, https://doi.org/10.1111/gcb.14858*.

Planes, S. et al. 2019. The Tara Pacific expedition—A pan-ecosystemic approach of the "-omics" complexity of coral reef holobionts across the Pacific Ocean. *PLOS Biology, https://doi.org/10.1371/journal.pbio.3000483.*

Lampe, R. H., Wang, S., Cassar, N., Marchetti, A. 2019. Strategies among phytoplankton in response to alleviation of nutrient stress in a subtropical gyre. *The ISME Journal, https://doi.org/10.1038/s41396-019-0489-6.*

Tang, W., Wang, S., Fonseca-Batista, D., Dehairs, F., Gifford, S., Gonzalez, A. G., Planquette, H., Sarthou, G., Gallinari, M., Cassar, N. 2019. Revisiting the distribution of global oceanic N_2 fixation and contribution to marine production. *Nature Communications, https://doi.org/10.1038/s41467-019-08640-0.*

Tang, W., Li, Z., Cassar, N. 2019. Machine learning estimates of global oceanic nitrogen fixation. JGR-Biogeosciences, https://doi.org/10.1029/2018JG004828.

Lin, Y., Gifford, S., Ducklow, H., Schofield, O., Cassar, N. 2019. Towards quantitative microbiome community profiling using internal standards. *Applied and Environmental Microbiology, doi: 10.1128/AEM.02634-18.*

Li, Z. & Cassar, N. 2018. Theoretical considerations on factors confounding the interpretation of the oceanic carbon export ratio. *Global Biogeochemical Cycles, https://doi.org/10.1029/2018GB006003.*

Berthelot, H., Duhamel, S., L'Helguen, S., Maguer, J.-F., Wang, S., Cassar, N. 2018. NanoSIMS single cell analyses reveal the contrasting nitrogen sources for small phytoplankton. *The ISME Journal, doi.org/10.1038/s41396-018-0285-8.*

Nevison, C., Munro, D., Lovenduski, N., Cassar, N., Keeling, R., Krummel, P., Tjiputra, J. 2018. Net community production in the Southern Ocean: Insights from comparing atmospheric potential oxygen to satellite ocean color algorithms and ocean models. *Geophysical Research Letters, doi: 10.1029/2018GL079575.*

Simonin, M., Colman, B. P., Tang, W., Judy, J. D., Anderson, S. M., Bergemann, C. M., Rocca, J. D., Unrine, J. M., Cassar, N., Bernhardt, E. S. 2018. Plant and microbial responses to repeated $Cu(OH)_2$ nanopesticide exposures under different fertilization levels in an agro-system. *Frontiers in Microbiology, doi: 10.3389/fmicb.2018.01769.*

Wang, S., Lin, Y., Gifford, S., Eveleth, R., Cassar, N. 2018. Linking patterns of net community production and marine microbial community structure in the western North Atlantic. *The ISME Journal, https://doi.org/10.1038/s41396-018-0163-4.*

Ducklow, H. W., Stukel, M., Eveleth, R., Jickells, T., Schofield, O., Doney, S., Baker, A., Brindle, J., Chance, R., Cassar, N. 2018. Spring-summer net community production, new production, particle export and related water column biogeochemical processes in the marginal sea ice zone of the Western Antarctic Peninsula 2012-2014. *Phil Trans Royal Soc, DOI 10.1098/rsta.2017.0177.*

Cassar, N., Tang, W., Gabathuler, H., Huang, K. 2018. Method for high frequency underway N_2 fixation measurements: Flow-through incubation Acetylene Reduction Assays by Cavity ring down laser Absorption Spectroscopy (FARACAS). *Analytical Chemistry*, 90(4): 2839-2851.

Moreno, C. M., Lin, Y., Davies, S. W., Monbureau, E., Cassar, N., Marchetti, A. 2018. Examination of gene repertoires and physiological responses to iron and light limitation in Southern Ocean diatoms. *Polar Biology*, doi: 10.1007/s00300-017-2228-7.

Lin, Y., Cassar, N., Marchetti, A., Ducklow, H., Li, Z. 2017. Specific eukaryotic plankton are good predictors of net community production in the Southern Ocean. *Scientific Reports*, doi:10.1038/s41598-017-14109-1.

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Eveleth, R., Cassar, N., Sherrell, R. M., Meredith, M. P., Ducklow, H., Lin, Y., Li, Z. 2017. Ice melt influence on summertime net community production along the Western Antarctic Peninsula. *Deep Sea Research II*: 139: 89-102.

Eveleth, R., Cassar, N., Doney, S.C., Munro, D.R., Sweeney C. 2017. Biological and physical controls on O_2/Ar, Ar and pCO_2 variability at the Western Antarctic Peninsula and Drake Passage. *Deep Sea Research II*, 139: 77-88.

Erickson, Z. K., Thompson, A. F., Cassar, N., Sprintall, J. 2016. Advective generation of Deep-Chlorophyll Maxima (DCMs) in Southern Drake Passage. *Geophysical Research Letters*, doi: 10.1002/2016GL070565.

Li, Z., Cassar, N., Huang, K., Ducklow, H., Schofield, O. 2016. Interannual variability in net community production at the Western Antarctic Peninsula region (1997-2014). *Journal of Geophysical Research*, doi: 10.1002/2015JC011378.

Li, Z. & Cassar, N. 2016. Satellite estimates of net community production based on O_2/Ar observations and comparison to previous estimates. *Global Biogeochemical Cycles*, doi: 10.1002/2015GB005314.

Bender, M. L., Tilbrook, B., Cassar, N., Jonsson, B., Poisson, A., Trull, T. W. 2016. Ocean productivity south of Australia during spring and summer. *Deep Sea Research Part I, 112: 68-78.*

Huang, K., Cassar, N., Jonsson, B., Cai, W.-J., Bender, M. L. 2015. An ultra-high precision, high frequency dissolved inorganic carbon analyzer based on dual isotope dilution and cavity ring-down spectroscopy. *Environmental Science & Technology, 49(14): 8602-8610*.

Marchetti, A., Catlett, D., Hopkinson, B. M., Ellis, K., Cassar, N. 2015. Marine eukaryotic proteorhodopsins and their potential role in coping with low iron availability. *ISME, DOI: 10.1038/ismej.2015.74.*

Cassar. N., Wright, S. W., Thomson, P., Trull, T. W., Westwood, K. J., de Salas, M., Davidson, A., Pearce, I., Davies, D. M., Matear, R. J. 2015. The relation of net community production to plankton community in the Southern Ocean. *Global Biogeochemical Cycles, DOI: 10.1002/2014GB004936.*

Shadwick, E. H., Tilbrook, B., Cassar, N., Trull, T. W., Rintoul, S. R. 2015. Summertime physical and biological controls on O_2 and CO_2 in the Australian Sector of the Southern Ocean. *Journal of Marine Systems, 147:21-28.*

Cassar, N., Nevison, C. D., Manizza, M. 2014. Correcting oceanic O_2/Ar-net community production estimates for vertical mixing using N_2O observations. *Geophysical Research Letters, DOI: 10.1002/2014GL062040.*

Ulfsbo, A. Cassar, N., Korhonen, M., van Heuven, S., Hoppema, M., Kattner, G., Anderson, L. G. 2014. Late summer net community production estimates in the Central Arctic Ocean based on multiple approaches. *Global Biogeochemical Cycles, DOI: 10.1002/2014GB004833.*

Eveleth, R. Timmermans, M.-L., Cassar, N. 2014. Physical and biological controls on oxygen saturation in the upper Arctic Ocean. *Journal of Geophysical Research, DOI: 10.1002/2014JC009816.*

Rödenbeck, C., Bakker, D. C. E., Metzl, N., Olsen, A., Sabine, C., Cassar, N., Reum, F., Keeling, R. F., Heimann, M. 2014. Interannual sea-air CO_2 flux variability from an observation-driven ocean mixed-layer scheme. *Biogeosciences, DOI:10.5194/bg-11-4599-2014.*

Rutgers v.d. Loeff, M., Cassar, N., Nicolaus, M., Rabe, B., Stimac, I. 2014. The influence of sea-ice cover on air-sea gas exchange estimated with radon-222 profiles. *Journal of Geophysical Research, 119: 2735-2751.*

Chang, C.-H., Johnson, N. C., Cassar, N. 2014. Neural network-based estimates of Southern Ocean net community production from in-situ O_2/Ar and satellite observations: A methodological study. *Biogeosciences, 11: 3279-3297.*

Huang, K., Cassar, N., Wanninkhof, R., Bender, M. L. 2013. A novel method for high frequency measurements of dissolved inorganic carbon concentration in the surface ocean. *Limnology and Oceanography: Methods 11: 572-583.*

Martin, P., Rutgers v.d. Loeff, M., Cassar, N., Vandromme, P., d'Ovidio, F., Rengarajan, R., Soares, M., Gonzales, H. E., Ebersbach, F., Lampitt, R. S., Sanders, R., Barnett, B. A., Smetacek, V., Naqvi, S. W. A. 2013. Net community production and downward particle export during the LOHAFEX artificial iron fertilization experiment. *Global Biogeochemical Cycles* 27: 1-11.

Castro-Morales, K., Cassar, N. and Kaiser, J. 2013. Biological production in the Bellingshausen Sea from oxygen-to-argon ratios and oxygen triple isotopes. *Biogeosciences* 10: 2273-2291.

Li, Z., Li, L., Song, K., Cassar, N. 2013. Estimation of phytoplankton size fractions based on spectral features of remote sensing ocean color data. *Journal of Geophysical Research* 118: 1-14.

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Bhattachan, A., D'Odorico, P., Baddock, M., Zobeck, T., Okin, G., Cassar, N. 2012. The Southern Kalahari: A potential new dust source in the southern hemisphere? *Environmental Research Letters 7*: doi:10.1088/1748-9326/7/2/024001.

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rapid changes in productivity during a Lagrangian experiment in the Southern Ocean. *Journal of Geophysical Research 117:* doi:10.1029/2011JC007046.

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Marchetti, A. & Cassar, N. 2009. Iron-induced changes in diatom elemental stoichiometry and morphology: a brief review with potential paleoceanographic applications. *Geobiology 7:1-13.*

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Reports:

Thompson, A. F., Cassar, N. Physical-Biogeochemical Coupling in the Southern Ocean. Meeting Report. *Eos, 96,* doi:10.1029/2015EO036829. Published on 9 October 2015.

Bender, M.L., Cassar, N., Mika, R. Atmospheric O_2/N_2 and Ar/N_2 studies at Cape Grim. Baseline 2003-2004 Atmospheric Program Report. Australian Bureau of Meteorology and CSIRO Marine and Atmospheric Research. Published 2006, edited by J.M. Cainey, N. Derek, and P.B. Krummel.

Meinesz A., Cottalorda J.M., Chiaverni D., Cassar N. et Vaugelas De J. Suivi de l'invasion de l'algue tropicale Caulerpa taxifolia en Méditerranée: situation au 31.12.1997. (ed). Lab. Environnement Marin Littoral, Univ. Nice - Sophia Antipolis, Nice. Published 1998, 238 pg.

E. GRADUATE AND POSTDOCTORAL ADVISORS

Michael Bender, Princeton University, Postdoctoral Advisor
Edward Laws, University of Hawaii, Ph.D. Advisor

Ph.D. Committee Members:
Paul Falkowski, David Karl, Fred Mackenzie, Robert Bidigare, Brian Popp

F. CURRENT AND PAST STUDENTS AND POSTDOCS

Postdocs:
Kuan Huang, Yajuan Lin, Shing Chang, Jiayun Zhou, Adam Ulfsbo, Hugo Berthelot, Ali Merikhi

PhD students:

Rachel Eveleth, Zuchuan Li, Weiyi Tang, Seaver Wang, Alexandria Niebergall, Shuai Gu, Ariana de Souza, Perrin Hagge, Katryna Niva

Visiting PhD students (>1 year):
Yibin Huang, Yuanyuan Gu, Fan Wu

PhD committee member for:
Apurva Dave, Jennifer Ayers, Megumi Shimizu, Nicholas Foukal, Sijia Zhou, and Sarah Brody, Ryan Peabody, Kimberley Drouin, Patrick Gray, Carl Manner (Duke University), Kuan Huang (reader, Princeton University), Carly Moreno, Weida Gong, Meredith Meyer (UNC), Nina Delebecque (Rapporteur, UBO), Caroline Lory (Aix-Marseille Université)
MEM students:
Jaime Frungillo
Undergraduates:
Cameron Setzer (summer project 2011), Corinne Walden (senior thesis Spring 2012), Julia Hazel (summer 2012 and senior thesis 2013)

G. GRANTS

Army Research Office (ARO): Response of Nitrogen Fixation in Lichens and Mosses to a Rapidly Changing Arctic Environment (PI N. Cassar, $300,000, 03/28/2023-03/27/2026)

EU INTERACT Transnational Access: Field deployment of ARACAS in Svalbard (€ 15,520, 07/19/2023 – 10/29/2023)

Herbette Foundation : Assessment of Chromium Isotopes as a Paleoproxy of Ocean Productivity and Carbon Export Potential (Université de Lausanne, Switzerland) ($15,571, 06/28/2023-08/21/2023)

NSF RAPID : Exploring the high-frequency variability of air-sea CO_2 fluxes in the Eastern Equatorial Pacific from an ecotourism ship (PI N. Cassar, $57,000, 07/01/2022 – 06/30/2023)

EU INTERACT Transnational Access: N_2 Fix (€ 15,520, 06/19/2023 – 07/13/2023)

NSF: Development of an instrument for underway high-resolution estimates of aquatic gross primary production (lead PI N. Cassar, co-I D. Nicholson (WHOI), $1,577,617 / 2021-2025)

NSF: Underwater coded aperture miniature mass spectrometer. (lead PI J. Amsden, co-PI N. Cassar, C. Parker, J. Glass (Duke), M. Denton (Arizona), $1,268,754 / 2021-2024)

Swiss Polar Institute: GLACE Project: Greenland Circumnavigation Expedition. (Lehmann, Cassar, Jaccard, Simo, Schuback, Frey, 128,500 CHF + 2 months of ice breaker ship time on a cruise circumnavigating Greenland / 2018-2020)

NASA: Quantifying the carbon export potential of the marine microbial community: Coupling biogenic rates and fluxes with genomics at the ocean surface (EXPORTS) (Marchetti, Gifford, Cassar, $933,127 / 2017-2020)

NSF: Biological and physical drivers of oxygen saturation and net community production variability along the Western Antarctic Peninsula ($356,500/2017-2020)

International Chair of Excellence in Marine Ecology and Biogeochemistry, LabexMER LEMAR/IUEM (€ 600,000 / 2016-2021)

ACE Project: Antarctic Circumnavigation Expedition. Joint funding between Ecole Polytechnique Federal of Lausanne -EPFL- and the partnering polar institutes (Australia/ France/ Norway/ Russia/ South Africa/ UK) under the patronage of Mr Frederik Paulsen (€ 60,000 + 3 months of ice breaker ship time on a cruise circumnavigating Antarctica / 2016-2018)

Duke University: Duke-Third Institute of Ocean Oceanography Partnership for the study of polar biogeochemistry (Cassar, $50,000 / 2016-2017)

Sea Grant (NC): Response of North Carolina's Coastal Ecosystems to Extreme Weather Systems from the Perspective of Dissolved Inorganic Carbon, Biological Oxygen Production and N_2 Fixation (Cassar, $5,000 / 2016)

NSF: CAREER: Method development for high-resolution underway N_2 fixation measurements (Cassar, $790,179 / 2014-2019).

NSF: Physiological and ecosystem structure forcings on carbon fluxes in the Southern Ocean mixed layer. (Cassar, $492,333/ 2011-2014).

Sloan Research Fellowships Young Scholars (Cassar, $50,000 / 2012-2014)

NOAA: Method Development: Continuous underway DIC, CO_2 and O_2/Ar Measurements by membrane equilibrator dual inlet mass spectrometry (MEDIMS). Nicolas Cassar (Lead PI), with Rik Wanninkhof, Michael Bender (Co-PIs) ($509,037 / 2009-2012).

NSF: EAGER: Method development for the assessment of spatiotemporal variability of N_2 fixation: Acetylene Reduction Assay by CAvity ring-down Spectroscopy (ARACAS). Nicolas Cassar (Lead PI), Robert B. Jackson (Co-PI) ($248,446/ 2011-2013).

Water Resources Research Institute: Establishing a pre-drilling baseline of water-quality measurements in North Carolina before shale-gas extraction. Robert B. Jackson, Nicolas Cassar, Avner Vengosh ($49,947/ 2012).

Renaissance Computing Institute (RENCI): Carbon export from the surface oceans: Advanced geographical and visualization analyses (Cassar, $12,000 / 1 yr + on-site computer engineering support, 2013)

Duke/University of North Carolina Oceanographic Consortium (DUNCOC) (Cassar, 5 days of ship time aboard R/V *Cape Hatteras,* 2013)

H. TEACHING

Duke University: Fundamentals of Biogeochemistry and Water Pollution (EOS 225, graduate level); Changing Oceans (EOS 164s, Undergraduate level), Water Resources (Duke Kunshan University), Future of the Ocean: From Science to Policy (MarSci 201/Biology 159/ECS 205).

University of Hawaii: Teaching Assistant: Undergraduate level: Aquatic Pollution (OCN

320); Global Environmental Change (OCN/OEST/MET 310).Graduate Level: Chemical Oceanography Lab Methods (OCN 633)

I. SYNERGISTIC ACTIVITIES

Duke:

Senior Associate Dean of Research and Doctoral Programs (2019-2022), Nicholas School
Director of Graduate Studies, EOS (2014-2017)
Duke-UNC Oceanographic Consortium (DUNCOC) Advisory Committee
University Academic Council (2012-2013, 2018-2019)

External:

NASA EXPORTS Science Definition Team (2015-2016)
Workshop Co-Chair: Southern Ocean Dynamics and Biogeochemistry (Feb. 2-5, 2015, Keck Center, Caltech)

Reviewer for:

National Science Foundation (NSF), National Oceanic and Atmospheric Administration (NOAA), Proceedings of the National Academy of Science (PNAS), Functional Plant Biology, Global Biogeochemical Cycles, Limnology and Oceanography, Biogeosciences, Marine Ecology Progress Series, Hydrology Research and Phycologia.

Outreach:

Museum of Life and Science (2011-present)
Princeton Quest 2007, Quest 2008, Quest 2009 Science and Math Institute: summer program with K-12 Teachers, see http://teacherprep.reuniontechnologies.com/dynamic.asp?id=quest

Secondary School Educational Outreach 2009: Regular participation in the "Classroom Without Walls" program teaching Honors Biology students at Christchurch School, VA.

Moderator for the K-12 Pacific Symposium for Science and Sustainability (2001).

J. SOCIETY MEMBERSHIPS

American Geophysical Union (AGU)
Association for the Sciences of Limnology and Oceanography (ASLO)
American Association for the Advancement of Science (AAAS)
Sigma Xi, The Scientific Research Honor Society
Golden Key International Honour Society

K. SCIENTIFIC CRUISES

Yr3: Chief Scientist on cruise testing N_2 fixation method in Sargasso Sea (R/V Atlantic Explorer / August 2017) (Chief Scientist)

ACE Expedition (Antarctica / R/V Akademik Treshnikov / December 2016 – January 2017)

Yr2: Chief Scientist on cruise testing N_2 fixation method in Sargasso Sea (R/V Atlantic Explorer / August 2016) (Chief Scientist)

Yr1: Chief Scientist on cruise testing N_2 fixation method in Sargasso Sea (R/V Atlantic Explorer / August 2015) (Chief Scientist)

ArcticNet (CCGS Amundsen / July-August 2013). Primary production in the Labrador Sea and the Canadian Arctic

ARK-XXVI/3 (R/V Polarstern / August-October 2011). Carbon fluxes and production under and in Arctic sea ice

Australian Antarctic Division Southern Ocean Cruise (Aurora Australis / February-April 2005). Measurement of dissolved gases and dissolved inorganic carbon by membrane inlet mass spectrometry (MIMS) and isotope dilution MIMS

Southern Ocean Iron Experiment (SOFeX) Cruise (R/V Roger Revelle / January-February 2002). Photosynthetic carbon assimilation in response to iron fertilization

Antarctica Palmer Long Term Ecological (LTER-BP-046-O) Program (R/V Laurence M. Gould / January-February 2000). Bacterial productivity measurements

N_2O cruise (R/V KA`IMIKAI-O-KANALOA / July 19-26 1999)

L. ABSTRACTS/ PRESENTATIONS / POSTERS

Invited Talks

Duke University, Langford Lecture. Taking the pulse on the metabolic state of a changing ocean. 5 March 2020.

Florida State University, EOAS Colloquium. : Revisiting the biogeography of marine N_2 fixation with high-resolution observations. 13 September 2019.

Vetlesen Distinguished Speaker, GSO, University of Rhode Island. New insights into marine nitrogen fixation. 10 April 2019.

University of British Columbia, EOAS, Canada. Remotely Sensed Estimates and Controls of Large-scale Oceanic Net Community Production. 6 April 2017.

University of Victoria, EOS, Canada. Remotely Sensed Estimates and Controls of Large-scale Oceanic Net Community Production. 5 April 2017.

Old Dominion University, CCPO & MARI. The relation of net community production to plankton diversity at the Western Antarctic Peninsula. March 21 2016.

Institut Universitaire Européen de la Mer, France. Physiological and ecosystem structure forcings on carbon fluxes in the Southern Ocean Mixed layer. April 2 2015.

Peking University, China. Carbon fluxes at the Western Antarctic Peninsula. November 11 2014.

Third Institute of Oceanography, China. Carbon fluxes at the Western Antarctic Peninsula. November 18 2014.

Xiamen University, China. Carbon fluxes at the Western Antarctic Peninsula. November 17 2014.

Shanghai Jiao Tong University, China. Carbon fluxes at the Western Antarctic Peninsula. November 10 2014.

University of Oxford, England. Global net community production based on in-situ and remotely sensed properties. April 24 2014.

Université Pierre et Marie Curie, LOCEAN, Paris. Global net community production based on in-situ and remotely sensed properties. April 2 2014.

University of Georgia, Marine Sciences. Large-scale estimates of net community production in the Southern Ocean. September 24 2012.

The 18th International Symposium on Polar Sciences (ISPS). Korea Polar Research Institute, Jeju Island, Korea. New observational tools in the Southern Ocean. May 24-26 2012.

California Institute of Technology, Environmental Science and Engineering. Multiple constraints on net community production and its regulating factors in the Southern Ocean. May 2 2012.

College of Charleston, Grice Marine Laboratory. Multiple constraints on net community production and its regulating factors in the Southern Ocean. April 13 2012.

Duke University, University Program in Ecology. Multiple constraints on net community production and its regulating factors in the Southern Ocean. March 23 2012.

University of North Carolina at Chapel Hill, Marine Sciences. Multiple constraints on net community production and its regulating factors in the Southern Ocean. March 21 2012.

CSIRO, Aspendale, Victoria, Australia. Tools for the assessment of carbon export production. 14 January 2010.

CSIRO, Hobart, Tasmania, Australia. Net community productivity during the SAZ Sense campaign: Controls on carbon export production in the Australian Subantarctic zone. 18 November 2009.

Rutgers University, IMCS, USA. Controls on carbon export production in the Australian Subantarctic zone. 9 November 2009.

University of Southern California, Department of Earth Sciences. Towards a mechanistic understanding of productivity and carbon export in the Southern Ocean: New insights from dissolved O_2 isotopes and O_2/Ar ratios in surface waters. 14 April 2009.

University of Southern California, Department of Marine Environmental Biology. Inorganic carbon transport in marine phytoplankton: What can we learn from carbon isotope and disequilibrium experiments? 13 April 2009.

Duke University, Nicholas School of the Environment. Productivity of the Southern Ocean: New insights from dissolved O_2/Ar ratios in surface waters. 23 March 2009.

Stanford University, School of Earth Sciences, USA. Productivity of the Southern Ocean: New insights from dissolved O_2/Ar ratios in surface waters. 25 February 2009.

Lamont-Doherty Earth Observatory, USA. Productivity of the Southern Ocean: New insights from dissolved O_2/Ar ratios in surface waters. 18 February 2009.

Université Pierre et Marie Curie, Observatoire océanologique de Banyuls sur mer, France. Chemostat studies of photosynthetic carbon assimilation and net community productivity estimates from *in situ* dissolved O_2/Ar measurements. August 28th, 2008

Université de la Mediterranée, Centre d'Océanologie de Marseille, Campus de Luminy, CNRS, France. Chemostat studies of photosynthetic carbon assimilation and net community productivity estimates from *in situ* dissolved O_2/Ar measurements. September 2nd, 2008.

Boston University, Earth Sciences Department, Boston, USA. Inorganic carbon uptake in marine phytoplankton: Paleo-CO_2 reconstruction and response to the current rise in CO_2. March 18, 2008.

Boston University, Earth Sciences Department, Boston, USA. Marine net community productivity from dissolved O_2/Ar: A new perspective on what drives the Southern Ocean biological pump. March 17, 2008.

NIES (National Institute for Environmental Studies), Tsukuba, Japan. Atmospheric and oceanic oxygen measurements by mass spectrometry. January 15, 2008.

CSIRO, Hobart, Tasmania, Australia. Stable and radio-carbon isotope fractionation experiments: from algal physiology to paleo-CO_2 reconstruction. 16 January 2006.

Princeton University, Princeton, NJ. The contribution of carbon-concentrating mechanisms to photosynthetic carbon isotope fractionation (hosted by J. L. Sarmiento). 4 February 2004.

Others

Ocean Carbon & Biogeochemistry workshop, Woods Hole, USA. Z. Li, Y. Lin, N. Cassar. On the influence of phytoplankton size fractions on the carbon export ratio in the surface ocean (poster). 12-15 June 2023.

Ocean Carbon & Biogeochemistry workshop, Woods Hole, USA. M. R. Cohen, B. Stephens, M. G. Meyer, G. Sharpe, A. K. Niebergall, J. R. Graff, N. Cassar, A. Marchetti, C. Carlson, S. Gifford. Microbial respiration in contrasting ocean provinces via high-frequency optode measurements (poster). 12-15 June 2023.

FEMS (Federation of European Microbiologists), Hamburg, Germany. Southern Ocean Microbial Ecogenomics: A genomic atlas highlighting Southern Ocean's diversity and singularity. J. Pommellec, E. Faure, L.-M. Delpech, Y. Lin, N. Cassar, A. Cormier, L. Maignien. July 9-13, 2023.

Gordon Research Seminar/Gordon Research Conference for applied and environmental microbiology, Mount Holyoke College, MA, USA. Southern Ocean Microbial Ecogenomics: A genomic atlas highlighting Southern Ocean's diversity and singularity. J. Pommellec, E.

Faure, L.-M. Delpech, A. Murat Eren, Y. Lin, N. Cassar, A. Cormier, L. Maignien. July 16-21, 2023.

16th Symposium on Bacterial Genetics and Ecology (BAGECO), Copenhagen, Denmark. Southern Ocean Microbial Ecogenomics: A genomic atlas highlighting Southern Ocean's diversity and singularity. J. Pommellec, E. Faure, L.-M. Delpech, C. Noël, C. Vanni, A. Fernandez-Guerra, A. Murat Eren, Y. Lin, N. Cassar, A. Cormier, L. Maignien. June 26-30, 2023.

NASA Carbon Cycle and Ecosystems Workshop 2023, College Park, USA. Primary production during the decline phase of the North Atlantic annual spring bloom. M. G. Meyer, M. R. Cohn, N. Paul, M. Brzezinski, S. J. Kramer, G. Sharpe, A. Niebergall, S. Gifford, N. Cassar, A. Marchetti. May, 8-12, 2023.

Google Sci Foo Unconference, Mountain View, California. June 17-19, 2022.

Ocean Optics XXV 2022, Quy Nhon, Binh Dinh, Vietnam. Investigating biophysical interactions across the Gulf Stream front via fine-scale optical measurements. P. C. Gray, A. Windle, I. Sayvelev, J. Dale, K. Smith, J. Gronniger, N. Cassar, M. Levy, E. Boss, G. Silsbe, Z. Johnson, D. Hunt, S. Floge, G. Bourdin, D. W. Johnston. October, 2-7, 2022.

Ocean Carbon & Biogeochemistry workshop, Woods Hole, USA. S. Gu, Y. Lin, H. Berthelot, W. Tang, J. Robidart, A. M. Eren, H. W. Ducklow, N. Cassar. Sedimentary diazotroph contribution to measurable N_2 fixation in Antarctic waters (poster). 20-23 June 2022.

European Geosciences Union (EGU) General Assembly 2022, Vienna, Austria. Exploring the coupled ocean and atmosphere system with a data science approach applied to observations from the Antarctic Circumnavigation Expedition. J. Schmale, S. Landwehr, M. Volpi, F. Alexander Haumann, Charlotte M. Robinson, Iris Thurnherr, Valerio Ferracci, Andrea Baccarini, J. Thomas, I. Gorodetskaya, C. Tatzelt, S. Henning, R. L. Modini, H. J. Forrer, Y. Lin, N. Cassar, R. Simó, C. Hassler, A. Moallemi, S. E. Fawcett, N. Harris, R. Airs, M. H. Derkani, A. Alberello, A. Toffoli, G. Chen, P. Rodríguez-Ros, M. Zamanillo, P. Cortés-Greus, L. Xue, C. G. Bolas, K. C. Leonard, F. Perez-Cruz, and D. Walton. April, 3-8, 2022.

European Geosciences Union (EGU) General Assembly 2022, Vienna, Austria. Widespread phytoplankton blooms triggered by 2019-2020 Australian wildfires. W. Tang, J. Llort, J. Weis, S. Basart, Z. Li, S. Sathyendranath, T. Jackson, M. G. Perron, E. Sanz Rodriguez, B. Proemse, A. R. Bowie, C. Schallenberg, P. G. Strutton, R. Matear, N. Cassar, N. April, 3-8, 2022.

Ocean Carbon from Space ESA Workshop 2022, Virtual online event. Widespread and unprecedented phytoplankton blooms triggered by 2019–2020 Australian wildfires. J. Llort, W. Tang, J. Weis, M. Perron, S. Basart, Z. Li, S. Sahtyendranath, T. Jackson, E. Sanz Rodriguez, B. Proemse, A. Bowie, C. Schallenberg, P. Strutton, R. Matear, N. Cassar. 14-18 February 2022.

Ocean Sciences Meeting, Honolulu, USA. Biophysical interactions along the Gulf Stream front via an integrated observing campaign. P. C. Gray, A. Niebergall, A. Lohmann, A. Windle, A. Blawas, D. Hunt, G. Larsen, I. Savelyev, J. Gronniger, J. Dale, N. Bruns, N. Cassar, Z. Johnson, D. Johnston. 27 February- 4 March 2022.

Ocean Sciences Meeting, Honolulu, USA. Connecting marine microbial community composition with carbon export potential during the EXPORTS field campaigns. A. K. Niebergall, Y. Lin, R. Golchin, F. Wu, M. G. Meyer, M. Cohn, G. Sharpe, A. Marchetti, S. Gifford, N. Cassar. 27 February- 4 March 2022.

Ocean Sciences Meeting, Honolulu, USA. Decline in plankton diversity and carbon flux with reduced sea ice extent along the Western Antarctic Peninsula. Y. Lin, N. Cassar, C. Moreno, A. Marchetti, H. Ducklow, O. Schofield, E. Delage, M. Meredith, Z. Li, D. Eveillard, S. Chaffron. 27 February- 4 March 2022.

Ocean Sciences Meeting, Honolulu, USA. Microbial respiration at the Porcupine Abyssal Plain during a dissipating Spring bloom and its implications for carbon export. M. R. Cohn, G. Sharpe, M. G. Meyer, A. K. Niebergall, A. Marchetti, N. Cassar, S. M. Gifford. 27 February- 4 March 2022.

Ocean Sciences Meeting, Honolulu, USA. New Production during the EXPORTS Field Campaigns. M. G. Meyer, W. Gong, S. M. Kafrissen, O. Torano, D. E. Varela, A. E. Santoro, N. Cassar, S. Gifford, A. K. Niebergall, M. R. Cohn, G. Sharpe, A. Marchetti. 27 February- 4 March 2022.

AGU 2021 Meeting, New Orleans, USA. Diazotroph community and activity in the Southern Indian Ocean. S. Chowdhury, H. Berthelot, S. L'Helguen, J.-F. Maguer, C. Löscher, A. Singh, N. Cassar, S. Bonnet, M. Benavides. 13-17 December 2021.

AGU 2020 Meeting, Online. The intensifying role of high wind speeds on gas transfer velocities and air-sea carbon dioxide fluxes. Y. Gu, G. Gatul, N. Cassar. 1-17 December 2021.

Ocean Sciences Meeting, San Diego, USA. Data-driven modeling of the distribution of diazotrophs in the global ocean. W. Tang & N. Cassar. 16-21 February 2020.

Ocean Sciences Meeting, San Diego, USA. Machine-learning estimates of global marine gross primary production. Y. Huang, D. Nicholson, B. Huang, N. Cassar. 16-21 February 2020.

Ocean Sciences Meeting, San Diego, USA. Trends in tuna carbon isotopes suggest global changes in pelagic phytoplankton communities. A. Lorrain, H. Pethybridge, N. Cassar, et al. 16-21 February 2020.

Ocean Sciences Meeting, San Diego, USA. Productivity Measurements along an Upwelling Filament in the California Current Ecosystem using a Multi Method Approach. S. Kranz, T. Kelly, S. Wang, N. Cassar, M. Stukel. 16-21 February 2020.

Ocean Carbon & Biogeochemistry workshop, Woods Hole, USA. W. Tang & N. Cassar. Data-driven modeling of the distribution of diazotrophs in the global ocean (poster). 24-27 June 2019.

4th CLIOTOP Symposium, Keelung, Taiwan. Investigating drivers of spatial patterns and decadal shifts in marine food webs: results from global meta-analyses of nitrogen and carbon isotopes in tunas. H. Pethybridge, A. Lorrain, V. Allain, N. Bodin, N. Cassar, C. A. Choy, L. Duffy, B. Fry, B. Graham, A. J. Hobday, C. Langlais, J. M. Logan, F. Menard, C. Menkes, J. Navarro, R. Olson, D. Point, A. Receveur, C. Somes, J. Young, J1. 15-19 October 2018.

Challenger Conference, Newcastle, UK. Autonomous sampling and sensing of a bloom of N_2 fixing microorganisms in North Atlantic shelf seas. J. Robidart, W. Tang, M. Mowlem, N. Cassar. 10-13 September 2018.

Ocean Carbon & Biogeochemistry workshop, Woods Hole, USA. Z. Li & N. Cassar. Theoretical considerations on factors confounding the interpretation of the oceanic carbon export ratio (poster). 25-28 June 2018.

Ocean Carbon & Biogeochemistry workshop, Woods Hole, USA. W. Tang, Z. Li & N. Cassar. Machine learning estimates of biological nitrogen fixation in the world's oceans and comparison to other models (poster). 25-28 June 2018.

Ocean Carbon & Biogeochemistry workshop, Woods Hole, USA. S. Wang, W. Tang, H. Whitby, A. Gonzalez, H. Planquette, S. Gifford, Z. Johnson & N. Cassar. Variability in North Atlantic marine microbial communities in relation to patterns of nutrient availability, nitrogen fixation, and net community production (poster). 25-28 June 2018.

SCAR Open Science Conference, Davos, Switzerland. Biological carbon sink in the Southern Ocean: Estimates from satellites to the seabed. N. Cassar, D. Antoine, D. Barnes, S. Fawcett. 19-23 June 2018.

Ocean Sciences Meeting, Portland, USA. Contrasting Distribution of N_2 Fixation from the Oligotrophic to the Coastal Ocean in the Western North Atlantic Ocean. W. Tang, N. Cassar, S. Wang, D. Fonseca Batista, F. Dehairs, S. Gifford, A. Gonzalez, H. Planquette.11-16 February 2018.

Ocean Sciences Meeting, Portland, USA. A mechanistic model of an upper bound on oceanic carbon export as a function of mixed layer depth and temperature. Z. Li & N. Cassar. 11-16 February 2018.

Ocean Sciences Meeting, Portland, USA. Linking Patterns of Net Community Production and Marine Microbial Community Structure in the Western North Atlantic. S. Wang, N. Cassar, S. Gifford, Y. Lin, R. Eveleth. 11-16 February 2018.

Ocean Sciences Meeting, Portland, USA. From Microbial Community Structure to Biological Pump: Community Composition and Interactions are Good Predictors of Net Community Production at the Western Antarctica Peninsula. Y. Lin, N. Cassar, A. Marchetti, C. Moreno, H. Ducklow, Z. Li, R. Eveleth. 11-16 February 2018.

Biological Carbon Pump programs, Brest, France. N. Cassar. Linking patterns of net community production to marine microbial community and physiology. 18-20 October 2017.

Ocean Carbon & Biogeochemistry workshop, Woods Hole, USA. Z. Li & N. Cassar. A mechanistic model of an upper bound on oceanic carbon export as a function of mixed layer depth and temperature (poster). 26-29 June 2017.

Tara Pacific Scientific Meeting, Nice (France) & Monaco. N. Cassar & Y. Lin. Taking the pulse of the ocean: Insight into the metabolic balance of the open ocean and coral reefs. 26-27 June 2017.

Royal Society, Chicheley Hall, UK. In Icy Waters: The Future of Marine Biogeochemical Research off the West Antarctic Peninsula. N. Cassar. Linking patterns of net community

production and marine microbial community structure along the Western Antarctic Peninsula 17-18 May 2017.

CAN-US-GER Arctic GEOTRACES Workshop, UBC, Vancouver, Canada. A. Ulfsbo, E. M. Jones, M. Korhonen, B. Rabe, N. Cassar. Central Arctic Ocean Net Community Production - an underway O_2/Ar and pCO_2 approach. 23-26 May 2017.

AGU 2016 Fall Meeting, San Francisco, USA. Exploring estimates of Net Community Production and Export along the Western Antarctic Peninsula (WAP), 1993-2014. H. Ducklow, M. Stukel, J. Shovlowsky Bowman, H. Kim, N. Cassar, R. Eveleth, Z. Li, S. Doney, S. Sailley, T. Jickells, A. Baker and R. Chance. 12-16 December 2016.

Gordon Research Conference, Girona, Spain. First evidence of an unexplained patchwork of high concentrations of light NMHCs in summer Arctic sea ice. C. Boissard, N. Cassar, B. Bonsang, V. Gros, R. Sarda-Esteve, C. Burau, B. Kock, M. Nicolaus, T. Krumpen, I. Peeken. 26 June-1 July 2016.

European Geosciences Union, Vienna, Austria. What can atmospheric O_2/N_2 measurements tell us about variations in ocean biogeochemistry? C. Rödenbeck, N. Cassar, Y. Tohjima, M. Heimann, and R. Keeling. 17-22 April 2016.

Ocean Sciences Meeting, New Orleans, USA. The effect of sea-ice dynamics on net community production at the Western Antarctic Peninsula (WAP) region. Z. Li, N. Cassar, K. Huang, H. Ducklow, O. Schofield. 21-26 February 2016.

Ocean Sciences Meeting, New Orleans, USA. Summer ice melt influence on net community production along the Western Antarctic Peninsula. R. Eveleth, N. Cassar, R. Sherrell, M. Meredith, H. Ducklow, Y. Lin, Z. Li. 21-26 February 2016.

Gordon Research Conference, Lucca (Barga), Italy. Drivers and scales of O_2 and pCO_2 variability at the Western Antarctic Peninsula and Drake Passage. R. Eveleth, N. Cassar., S. Doney, D. Munro, H. Ducklow. 15-20 March 2015.

Gordon Research Conference, Lucca (Barga), Italy. Mapping the 'invisible forest' and its role in carbon cycling in the Southern Ocean. Y. Lin, N. Cassar., C. Moreno, A. Marchetti. 15-20 March 2015.

Southern Ocean Dynamics and Biogeochemistry Workshop, Caltech (Pasadena). Drivers of biological O_2 flux in the Western Antarctic Peninsula. 2-5 February 2015.

Southern Ocean Dynamics and Biogeochemistry Workshop, Caltech (Pasadena). Control of sea-ice dynamics on the inter-annual variability of net community production in the Western Antarctic Peninsula Region of the Southern Ocean. Z. Li, N. Cassar, K. Huang. 2-5 February 2015.

Palmer-LTER meeting, Williamsburg, USA. Physical and biological drivers of oxygen variability at the Antarctic Peninsula. N. Cassar, R. Eveleth, Z. Li, Y. Lin. 29 Sept-2 Oct. 2014.

1st ICOS Conference, Brussels, Belgium. Using atmospheric CO_2 and oxygen observations as well as oceanic pCO_2 observations to estimate CO_2 flux variability. C. Rödenbeck, D. C. E.

Bakker, N. Metzl, A. Olsen, C. Sabine, N. Cassar, F. Reum, R. F. Keeling, M. Heimann. 23-25 September 2014.

IMBER Open Science Conference, Bergen, Norway. Global sea-air CO_2 flux variability estimated from pCO_2 observations? C. Rödenbeck, D. C. E. Bakker, N. Metzl, A. Olsen, C. Sabine, N. Cassar, F. Reum, R. F. Keeling, M. Heimann. 23-27 June 2014.

Ocean Sciences Meeting, Honolulu, USA. Estimation of global net community production based on *in-situ* O_2/Ar measurements and remotely sensed properties. Z. Li & N. Cassar. 23-28 February 2014.

Ocean Sciences Meeting, Honolulu, USA. Physical and biological controls on oxygen variability in the central Arctic. R. Eveleth, M.-L. Timmermans, N. Cassar. 23-28 February 2014.

AMOS National Conference, Hobart, Australia. Summertime physical and biological controls on O_2 and CO_2 in the Australian Sector of the Southern Ocean. E. H. Shadwick, B. Tilbrook, N. Cassar, T. W. Trull, S. R. Rintoul. 12-14 February 2014.

AGU 2013 Fall Meeting, San Francisco, USA. An isotope dilution method for high frequency measurements of dissolved inorganic carbon concentration in the surface ocean. K. Huang, M. L. Bender, R. H. Wanninkhof, N. Cassar. 9-13 December 2013.

9th International Carbon Dioxide conference (ICDC9), Beijing, China. Global sea-air CO_2 flux variability from an ocean mixed-layer scheme driven by SOCAT pCO_2 observations. C. Rödenbeck, D.C.E. Bakker, N. Metzl, A. Olsen, C. Sabine, N. Cassar, R. Keeling, C., M. Heimann. 3-7 June 2013.

Ocean Carbon & Biogeochemistry workshop, Woods Hole, USA. Physical and biological controls on gas saturation variability in the Central Arctic. R. Eveleth, M.-L. Timmermans, N. Cassar. 22-25 July 2013.

45th International Liege Colloquium, Liege, Belgium. Biological production and the influence of vertical physical processes in the Bellingshausen Sea, Southern Ocean. K. Castro-Morales, N. Cassar, J. Kaiser. 13-17 May 2013.

45th International Liege Colloquium, Liege, Belgium. Influence of net community production and physical processes on surface oxygen and carbon distribution along a north-south section across the Australian sector of the Southern Ocean. E. Shadwick, N. Cassar, B. Tilbrook, T. Trull. 13-17 May 2013.

45th International Liege Colloquium, Liege, Belgium. Estimation of large-scale net community production patterns based on in-situ O_2/Ar measurements and remotely sensed properties. Z. Li, N. Cassar. 13-17 May 2013.

Gordon Research Conference Polar Marine Science, Ventura, USA. Comparison of multiple proxies of NCP in the central Arctic Ocean. A. Ulfsbo, N. Cassar, L. Anderson. 10-15 March 2013.

ASLO 2013 Aquatic Sciences Meeting, New Orleans, USA. A study of anthropogenic disturbance of the new river estuary using a Bayesian Belief Network approach. F. Nojavan, N. Cassar, S. Quian, K. Reckhow, H. Paerl. 17-22 February 2013.

AGU 2012 Meeting, San Francisco, USA. Neural network-based estimates of Southern Ocean net community production from in-situ and satellite observations: A methodological study. Chueh-Hsin Chang, N. Johnson, N Cassar. 3-7 December 2012.

TransCom Meeting, Nanjing, China. Combining atmospheric CO_2 and O_2 data with surface-ocean pCO_2 and $[O_2]$ to estimate ocean biogeochemistry. C. Rödenbeck, D.C.E. Bakker, N. Metzl, A. Olsen, C. Sabine, N. Cassar, Y. Tohjima, R. Keeling, C. Le Quéré, M. Heimann. 4-8 June 2012.

95th Canadian Chemistry Conference and Exhibition, Advances in Environmental Analytical Chemistry, Calgary, Canada. Short-term kinetics of dinitrogen fixation: Applications of a novel technique, ARACAS. M.-E. Jean, J.-P. Bellenger, N. Cassar, C. Setzer, B.A. Barnett. 26-30 May 2012.

Ocean Sciences Meeting, Salt Lake City, USA. Rapid changes in dissolved O_2/Ar in a lagrangian tracer patch reveal a system far from steady-state. R.C. Hamme, N. Cassar, M.L. Bender, V.P. Lance, P.G. Strutton, C.L. Sabine, D.T. Ho, B.R. Hargreaves. 20-24 February 2012.

Ocean Sciences Meeting, Salt Lake City, USA. Examining phytoplankton bloom phenology in the Southern Ocean. S. R. Brody, Dunne, J. P., Cassar, N., Lozier, M. S. 20-24 February 2012.

Ocean Sciences Meeting, Salt Lake City, USA. A re-examination of light limitation as a key factor limiting phytoplankton productivity in the Southern Ocean. W.R. Joubert, M.L. Bender, N. Cassar, S.J. Thomalla, P.M.S. Monteiro. 20-24 February 2012.

The Ocean Carbon Cycle at a time of change: Synthesis and vulnerabilities, Paris, France. Combining oceanic and atmospheric tracer data to estimate ocean biogeochemistry. C. Rödenbeck, R.F. Keeling, C. Lequéré, N. Cassar, Y. Tohjima, M. Heimann. 14-16 September 2011.

Biennial Challenger 2010, Southampton, U.K. Particle export during the Lohafex iron fertilization experiment. P. Martin, M. Rutgers van der Loeff, P. Vandromme, N. Cassar, F. Ebersbach, M. Iversen, R. Rengarajan, M. Soares, H. González, Richard Lampitt, Richard Sanders, V. Smetacek, W. Naqvi. 6-9 September 2010.

SCAR Open Science Conference, Buenos Aires, Argentina. The dependence of carbon export on phytoplankton taxonomy in the Australian Subantarctic zone. N. Cassar, M. L. Bender, S. W. Wright, K. J. Westwood, M. de Salas, A. Davidson, I. Pearce, T. W. Trull. 3-6 August 2010.

COCOS (COordination action Carbon Observing System), Bergen, Norway. Combining water column data with sediment trap and satellite observations for improved marine carbon export estimates. P. Martin, M. Rutgers van der Loeff, P. Vandromme, N. Cassar, F. Ebersbach, M. Iversen, R. Rengarajan, M. Soares, H. González, Richard Lampitt, Richard Sanders, V. Smetacek, W. Naqvi. 23-26 June 2010.

European Geosciences Union, Vienna, Austria. Using oxygen species to measure marine production in Drake Passage. K. Castro Morales, N. Cassar, M. Bender, J. Kaiser. 2-7 May 2010.

Ocean Sciences Meeting, Portland, USA. Controls on productivity and carbon export in the Australian Subantarctic Zone of the Southern Ocean: N. Cassar, M. L. Bender, P. J. DiFiore, B. D. Tilbrook, S. Wright, A. R. Bowie, K. Petrou. 22-26 February 2010.

Ocean Sciences Meeting, Portland, USA. A method for calculating sea-air gas exchange rates and its evaluation using upper ocean radon distributions: M. L. Bender, S. Kinter, N. Cassar, R. H. Wanninkhof. 22-26 February 2010.

Ocean Sciences Meeting, Portland, USA. Export production and its regulating factors in the Western Antarctic Peninsula region of the Southern Ocean: K. Huang, H. Ducklow, M. Vernet, M. R. Hiscock, N. Cassar, M. L. Bender. 22-26 February 2010.

Ocean Sciences Meeting, Portland, USA. A First synthesis of the GEOTRACES issues from the IPY BONUS GOODHOPE cruise in the Southern Ocean: M. Boye, E. P. Achterberg, J. Bown, E. Bucciarelli, D. Cardinal, N. Cassar, A. cavagna, F. Chever, F. Dehairs, R. A. Fine, J. Happell, C. Jeandel, W. Joubert, M. Labatut, F. Lacan, F. A. Le Moigne, P. Masqué, P. Monteiro, P. Penven, F. Planchon, A. RADIC, G. Sarthou, S. Speich, A. Tagliabue, E. Verdeny, B. D. Wake, H. Waldron. 22-26 February 2010.

Ocean Sciences Meeting, Portland, USA. Primary Production on the Eastern Bering Sea Shelf as Estimated from Oxygen/Argon Ratios and Triple Oxygen Isotopes: M G Prokopenko, J Granger, C Mordy, N Cassar, P J DiFiore, N Kachel, D Kachel, E D Cokelet, D M Sigman, B Moran. 22-26 February 2010.

8th International Carbon Dioxide conference (ICDC8), Jena, Germany. Implications of observed changes in atmospheric O_2 concentration since 1990. R. Keeling, N. Cassar, M. Bender.13-19 September 2009.

8th International Carbon Dioxide conference (ICDC8), Jena, Germany. Diagnosing the variability of ocean biogeochemistry: multiple constraints from atmospheric and oceanic data. C. Rödenbeck, C. Le Quéré, R. Keeling, N. Cassar, Y. Tohjima, M. Heimann.13-19 September 2009.

8th International Carbon Dioxide conference (ICDC8), Jena, Germany. Net biological and gross oxygen production in the Drake Passage region. K. Morales, N. Cassar, M. Bender, J. Kaiser.13-19 September 2009.

AGU Chapman conference on the biological carbon pump of the oceans, Brokenhurst, England. The morphometrics of pennate diatom frustules in the sediments are potential indicators of iron-limited growth in past oceans. A. Marchetti & N. Cassar. 1-4 September 2009.

AGU Chapman conference on the biological carbon pump of the oceans, Brokenhurst, England. Comparison of O_2 observations and model predictions in the Southern Ocean. B. Jonsson, N. Cassar, M. Bender, J. Dunne, S. Doney. 1-4 September 2009.

Goldschmidt 2009, Davos, Switzerland. A First Look at GEOTRACES Issues from the IPY BONUS GOODHOPE Cruise in the Southern Ocean Boye M, Achterberg E, Bown J, Bucciarelli E, Cardinal D, Cassar N, Cavagna A-J, Chever F, Dehairs F, Fine RA, Happell J, Joubert W, LeMoigne F, Masqué P, Monteiro P, Planchon F, Sarthou G, Verdeny E, Wake B & Waldron H. 21-26 June 2009.

NASA Ocean Color meeting, New York. Comparison of O_2 observations and model predictions in the Southern Ocean. B. Jonsson, N. Cassar, M. Bender, J. Dunne, S. Doney. 4-6 May 2009.

Bonus-GoodHope Workshop, VilleFranche, France. O_2/Ar derived net community productivity in the African sector of the Southern Ocean. 23 January 2009.

AGU 2008 Meeting, San Francisco, USA. Low net community production from oxygen/argon mass balance during the Southern Ocean Gas Exchange Experiment. Hamme, R.C., Cassar, N. *Eos Trans. AGU, 89*(53), Abstract OS31B-1270. 15-19 December 2008.

AGU 2008 Meeting, San Francisco, USA. The role and implementation of a two-step mechanism for hematite dissolution on aeolian input of soluble iron to the ocean. Levy, H., Fan, S., Moxim, W.J., Cassar, N. *Eos Trans. AGU, 89*(53), Abstract OS14B-06. 15-19 December 2008.

AGU 2008 Meeting, San Francisco, USA. Spring bloom dynamics of the Eastern Bering Sea shelf as estimated from oxygen/argon ratios and triple oxygen isotopes. Prokopenko, M., Granger, J., Mordy, C.W., DiFiore, P., Cassar, N., Cokelet, E., Kachel, N.B., Kachel, D.N., Sambrotto, R., Moran, B. *Eos Trans. AGU, 89*(53), Abstract OS31B-1275. 15-19 December 2008.

IMPETUS 2008, Techniques in polar ocean observations and monitoring, St. Petersburg, Russia. High-resolution net community productivity by equilibrator inlet mass spectrometry (EIMS). November 19-22, 2008.

CLIMECO workshop, Brest, France. Towards a mechanistic understanding of carbon cycling in the equatorial Pacific Ocean. R. Stanley, J. Kirkpatrick, N. Cassar, and M. Bender. 2008.

Leverhulme Climate Symposium, Cambridge and London, UK. Towards a mechanistic understanding of carbon cycling in the equatorial Pacific. Stanley, R.H.R., J.B. Kirkpatrick, N. Cassar, and M.L. Bender. 2008.

13th Biennial Challenger Conference for Marine Science, Bangor University, UK. The distribution of net and gross production in the oceans. Bender, M. Cassar, N., Kaiser, J., Stanley, R., Barnett, B., Tilbrook, B. September 8-11 2008.

Polar Research- Arctic and Antarctic Perspectives in the International Polar Year, St. Petersburg, Russia. Fate of sinking biogenic material in the Australian sector of the Southern Ocean: contrasting regimes of nutrient availability and ecosystems functioning. Jacquet, S.H.M., Cavagna, A.J., Cassar, N., DiFiore, P.J., Cardinal, D., Lam, P., Griffiths, B., Dehairs, F. July 8-11 2008.

Effect of Climate Change on the World's Oceans, Gijón, Spain. The Australian SAZ-SENSE study of the sensitivity of the Sub-Antarctic Zone to climate change. Trull, T.W., Bowie, A.R., Boyd, P., Cassar, N., Davidson, A., Griffiths, F.B., Rintoul, S.R., Thomson, P., Tilbrook, B., Wright, S. May 19-23, 2008.

NGPR Symposium, International Polar Year, Colorado, USA. A new perspective on primary productivity and iron limitation in the Southern Ocean. May 4-11, 2008.

NASA Carbon Cycle and Ecosystems Joint Science Workshop, MD, USA. High resolution Australian Subantarctic Net Community productivity estimates by in situ continuous dissolved O_2/Ar measurements. Cassar, N. Bender, M.L., DiFiore, P.J., Barnett, B.A., Tilbrook, B. April 28- May 2, 2008.

European Geosciences Union (EGU) General Assembly 2008, Vienna, Austria. Interannual variability in oceanic biogeochemical processes inferred by inversion of atmospheric O_2/N_2 and CO_2 data. Rödenbeck, C., LeQuéré, C., Cassar, N., Tohjima, Y., Heimann, M., Keeling, R. April, 13-18, 2008.

European Geosciences Union (EGU) General Assembly 2008, Vienna, Austria. Summer f-ratios and net community production in the Australian sector of the Southern Ocean: contrasting regimes of nutrient availability and ecosystems functioning. Cavagna, A.-J., Cassar, N., Dehairs, F., DiFiore, P. J., Tilbrook, B., Griffiths, B., Elskens, M. April, 13-18, 2008.

Ocean Sciences Meeting, Orlando, USA. Australian Subantarctic net community productivity by equilibrator inlet mass spectrometry. N. Cassar, P. DiFiore, M. Bender, B. Barnett, B. Tilbrook. March 2-7, 2008.

Ocean Sciences Meeting, Orlando, USA. Community production measurements in the equatorial Pacific. J. Kirkpatrick, R. Stanley, N. Cassar, M. Bender, J. Murray. March 2-7, 2008.

SAZ-Sense Workshop, Hobart, Tasmania, Australia. *In situ* continuous net community and gross primary productivities in the Australian sector of the Subantarctic zone by equilibration inlet mass spectrometry. N. Cassar, P. DiFiore, M. Bender, B. Barnett, B. Tilbrook. November 6-8, 2007.

Global Carbon Cycle Program Principal Investigators Meeting, Washington D.C., USA. Distribution of O_2 in air: implications for the carbon cycle. M. Bender, R. Keeling, N. Cassar, R. Mika, P. Tans, T. Conway. September 10-11, 2007.

Gordon Research Conference, NH, USA. Net community production and gross production in the summertime Southern Ocean mixed layer. M. Bender, N. Cassar, M. Reuer, B. Barnett, S. Fan, W. Moxim, H. Levy, B. Tilbrook. August 5-10, 2007.

IOC/UNESCO Surface Ocean CO_2 variability and Vulnerabilities Workshop, Paris, France. Estimating ocean-atmosphere carbon fluxes from atmospheric oxygen measurements. M. Battle, M. Bender, N. Cassar, R. Hamme, R. Keeling, C. Nevison. April 11-14 2007.

NASA Ocean Color Research Team meeting, Seattle, WA, USA. Net and Gross Production in the Southern Ocean mixed layer. M. Bender, N. Cassar, M. Reuer, B. Barnett, S. Fan, H. Levy, W. Moxim, B. Tilbrook. April 11-13 2007.

AGU 2006 Ocean Sciences Meeting, HI, USA. O_2/Ar and triple isotope composition of oxygen measurements as an estimate of net and gross marine productivity in the Southern Ocean. N. Cassar, J. Kaiser, B. Barnett, M.L. Bender. *Eos Trans. AGU, 87*(36), *Ocean Sci. Meet. Suppl., Abstract OS45J-04*. 20-24 February 2006.

Princeton Environmental Institute Presentation, Princeton, NJ. Rubisco vs. carbon-concentrating mechanisms: Energetic trade-off? 2 December 2005.

The Gary Comer Abrupt Climate Change Roundtable, NY. Poster presentation. J. Kaiser, N. Cassar, M. Reuer, B. Barnett, B. Sturtevant, M. Bender. O_2 studies of net and gross production in the Southern Ocean. 19-22 October 2005.

Seventh International Carbon Dioxide Conference, Boulder, Colorado. C. Rödenbeck, C. Le Quéré, R. Keeling, Y. Tohjima, N. Cassar, A. Manning, M. Heinmann presentation: Estimates of APO fluxes based on O_2/N_2 and CO_2 concentration measurements. 25-30 September 2005.

Seventh International Carbon Dioxide Conference, Boulder, Colorado. Poster Presentation. M. Bender, M. Battle, D. Ho, M. Hendricks, R. Mika, P. Tans, T. Conway, B. Sturtevant, N. Cassar. Update on atmospheric O_2/N_2 measurements, from 1994 to 2002. 25-30 September 2005.

CICS Carbon Cycle Science Meeting, Princeton University, Princeton. M. Bender, R. Mika, N. Cassar. Studies of the distribution of O_2 in air: an update. 1-3 June 2005.

Vth International Symposium on Inorganic Carbon Utilization by Aquatic Photosynthetic Organisms, St-Sauveur, Quebec, Canada. 2 Poster presentations: "Bicarbonate uptake by Southern Ocean phytoplankton" and "The contribution of Rubisco and other carboxylases to photosynthetic carbon isotope fractionation in a marine diatom". 24-28 August 2004.

Dissertations Symposium on Chemical Oceanography. Big Island, Hawaii. Title of presentation: The role of carbon-concentrating-mechanisms and β-carboxylation in photosynthetic stable carbon isotope fractionation. 28 September-4 October 2003.

U.S. JGOFS Synthesis & Modeling Project. Woods Hole Oceanographic Institution, Massachusetts. Poster presentation: "Bicarbonate uptake by Southern Ocean phytoplankton". 21-24 July 2003.

AGU 2002 Meeting. San Francisco, California. R. Bidigare, S. Christensen, S. Brown, K. Selph, C. Sheridan, N. Cassar, M. Landry. Fe-Stimulated Changes in Phytoplankton Biomarker Distributions and Carbon Isotopic Compositions During SOFeX. *Eos Trans. AGU, 83*(47), Abstract OS22D-04. 6-10 December 2002.

AGU 2002 Meeting. San Francisco, California. S. Brown, M. Landry, K. Selph, R. Bidigare, S. Christensen, B. Twining, N. Cassar, Z. Johnson, C. Sheridan. Plankton Community Response to Iron-Fertilization in the "Northern Patch" at 56°S. *Eos Trans. AGU, 83*(47), Abstract OS11A-0216. 6-10 December 2002.

AGU 2002 Meeting. San Francisco, California. M. Landry, S. Brown, K. Selph, R. Bidigare, Z. Johnson, C. Sheridan, S. Christensen, B. Twining, N. Cassar. Biomass, Growth and Grazing Responses in the SOFeX Iron-Fertilized Patch at 66°S. *Eos Trans. AGU, 83*(47), Abstract OS22D-07. 6-10 December 2002.

Goldschmidt Conference. Hot Springs, Virginia. B. Popp, R. Bidigare, E. Laws, N. Cassar. Carbon Isotopic Fractionation in Marine Microalgae: Implications for Interpretation of Secular Variations in $\delta^{13}C$ of Organic Matter. 20-24 May 2001.