David Nicholson

Associate Scientist w/ tenure
Marine Chemistry and Geochemistry
Woods Hole Oceanographic Institution
Woods Hole, MA 02543

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EDUCATION

10/2009 **Ph.D.** in Oceanography
University of Washington, Seattle, WA
Advisor: Professor Steve Emerson
Thesis: *Nitrogen, oxygen and the noble gases as tracers of upper-ocean productivity and air-sea gas fluxes*

1/2004 **M.S.** in Geological and Environmental Sciences
Stanford University, Stanford, CA
Advisor: Professor Adina Paytan
Thesis: *Phosphorus status of phytoplankton in Monterey and San Francisco Bays*

6/2003 **B.S.** in Geological and Environmental Science, Chemistry Minor,
Stanford University, Stanford, CA

PROFESSIONAL EXPERIENCE

2/2021 - Present **Associate Scientist w/ tenure**
Woods Hole Oceanographic Institution, Woods Hole, MA

8/2016 - 2/2021 **Associate Scientist**
Woods Hole Oceanographic Institution, Woods Hole, MA

8/2011 - Present **Assistant Scientist**
Woods Hole Oceanographic Institution, Woods Hole, MA

10/2009 - 8/2011 **Postdoctoral Investigator, Supervisor: Scott Doney**
Woods Hole Oceanographic Institution, Woods Hole, MA

6/2009 - 10/2009 **Visiting Graduate Student, Supervisor: Scott Doney**
Woods Hole Oceanographic Institution, Woods Hole, MA

5/2004 - 10/2009 **Research Assistant, Supervisor: Steve Emerson**
School of Oceanography, University of Washington, Seattle, WA

5/2001 - 12/2003 **Research Assistant, Supervisor: Adina Paytan**
Geological and Environmental Sciences, Stanford University, Stanford, CA

8/2000 - 11/2000 **NSF REU, Supervisor: Dennis Hansell**
Bermuda Biological Station for Research, Ferry Reach, Bermuda

RESEARCH INTERESTS

- Autonomous platforms and sensors for biogeochemistry
- Biogeochemical and ecosystem models of varying complexity
- Air-sea gas exchange
- Primary productivity
- Dissolved gas tracers

AWARDS AND HONORS

- National Academies of Science Kavli Fellow, July 2022
- WHOI Early Career Scientist Award, July 2019
- Best Poster, PICES/ICES Young Investigator Symposium, April 2012, Mallorca, Spain
- NASA Earth System Science Graduate Fellow, Sep 2006 – Sep 2009
- Organizer/Founder: The Graduate Climate Conference, April 2006, Seattle, WA
- UW Program on Climate Change Graduate Fellow, June 2004 – June 2005
- Scripps Institute of Oceanography Reagents Fellowship (declined), 2004

PUBLICATIONS IN REVIEW

Seltzer, A.M, **Nicholson D.P.**, Smethie W.M., Tyne, R.L, Le Roy, E., Stanley, R.H.R., Stute, M., Barry P.H., McPaul, K., Davidson P.W., Chang, B.X., Rafter, P.A., Lethaby, P., Johnson, R., Khatiwala, S., Jenkins, W.J. (in press) Dissolved gases track deep ocean ventilation processes in the deep North Atlantic. *PNAS*

Stephens, B.M., J. Fox, S. Liu, K. H. Halsey, **D. P. Nicholson**, S. Traylor and C. A. Carlson. (in review) Bacterioplankton production, biomass and community composition influenced by amino acids at the subarctic Pacific's Ocean Station Papa. *Elementa Science of the Anthrhropocene*

Niebergall, A.K., S. Traylor, Y. Huang, M. Feen, M. G. Meyer, H. M. McNair, **D. Nicholson**, A. J. Fassbender, M. M. Oman, A. Marchetti[7], S. Menden-Deuer, W. Tang[1,8], W. Gong, P. Tortell, R. Hamme, N. Cassar. (in review) Evaluation of new and net community production estimates by multiple ship-based and autonomous observations in the Northeast Pacific Ocean. *Elementa Science of the Anthrhropocene*

Lerner, P., A. Romanou, **D. Nicholson**, M. Kelley, R. Ruedy, G. Russel. (in review) The Influence of Remineralization on the Equatorial Pacific ODZ. *Ocean Modelling*

PEER REVIEWED PUBLICATIONS

†- indicates an advisee is lead author

[36] Dall'Olmo, G., Bhaskar TVS, U., Bittig, H., Boss, E., Brewster, J., Claustre, H., Donnelly, M., Maurer, T., **Nicholson, D.**, and Paba, V. (2022) Real-time quality control of optical backscattering data from Biogeochemical-Argo floats, Open Research Europe, 2, 118, 2022.

[35] Huang, Y., Eveleth, R., **Nicholson, D.**, & Cassar, N. (2022). Can We Estimate Air-Sea Flux of Biological O2 From Total Dissolved Oxygen? *Global Biogeochemical Cycles*, *36*(9), e2021GB007145. https://doi.org/10.1029/2021GB007145

[34] Scully, M. E., Michel, A. P. M., **Nicholson, D. P.**, & Traylor, S. (2022). Spatial and temporal

variations in atmospheric gas flux from the Hudson River: the estuarine gas exchange maximum. *Limnology and Oceanography*, 67(7), 1590–1603. https://doi.org/10.1002/lno.12154

[33] Atamanchuk, D., Palter, J., Palevsky, H., Le Bras, I., Koelling, J., & **Nicholson, D.** (2021). Linking Oxygen and Carbon Uptake with the Meridional Overturning Circulation Using a Transport Mooring Array. *Oceanography*, 9–9. https://doi.org/10.5670/oceanog.2021.supplement.02-03

[32] Cassar, N., **Nicholson, D.**, Khatiwala, S., & Cliff, E. (2021). Decomposing the Oxygen Signal in the Ocean Interior: Beyond Decomposing Organic Matter. *Geophysical Research Letters*, 48(18), e2021GL092621. https://doi.org/10.1029/2021GL092621

[31] Siegel, D. A., Cetinić, I., Graff, J. R., Lee, C. M., Nelson, N., Perry, M. J., Ramos, I. S., Steinberg, D. K., Buesseler, K., Hamme, R., Fassbender, A. J., **Nicholson, D.**, Omand, M. M., Robert, M., Thompson, A., Amaral, V., Behrenfeld, M., Benitez-Nelson, C., Bisson, K., Boss, E., Boyd, P. W., Brzezinski, M., Buck, K., Burd, A., Burns, S., Caprara, S., Carlson, C., Cassar, N., Close, H., D'Asaro, E., Durkin, C., Erickson, Z., Estapa, M. L., Fields, E., Fox, J., Freeman, S., Gifford, S., Gong, W., Gray, D., Guidi, L., Haëntjens, N., Halsey, K., Huot, Y., Hansell, D., Jenkins, B., Karp-Boss, L., Kramer, S., Lam, P., Lee, J.-M., Maas, A., Marchal, O., Marchetti, A., McDonnell, A., McNair, H., Menden-Deuer, S., Morison, F., Niebergall, A. K., Passow, U., Popp, B., Potvin, G., Resplandy, L., Roca-Martí, M., Roesler, C., Rynearson, T., Traylor, S., Santoro, A., Seraphin, K. D., Sosik, H. M., Stamieszkin, K., Stephens, B., Tang, W., Van Mooy, B., Xiong, Y., and Zhang, X.(2021) An operational overview of the EXport Processes in the Ocean from RemoTe Sensing (EXPORTS) Northeast Pacific field deployment, *Elementa Science of the Anthrhropocene*, 9, https://doi.org/10.1525/elementa.2020.00107.

[30] Michel, A. P. M., Preston, V. L., Fauria, K. E., & **Nicholson, D. P.** (2021). Observations of Shallow Methane Bubble Emissions From Cascadia Margin. *Frontiers in Earth Science*, *9*, 285. https://doi.org/10.3389/feart.2021.613234.

[29] †Dever, M., **Nicholson, D.**, Omand, M. M., & Mahadevan, A. (2021). Size-Differentiated Export Flux in Different Dynamical Regimes in the Ocean. *Global Biogeochemical Cycles*, *35*(3), e2020GB006764. https://doi.org/10.1029/2020GB006764.

[28] 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*, *35*(3), e2020GB006718. https://doi.org/10.1029/2020GB006718.

[27] †Manning C.C., V.L. Preston, S.F. Jones, A.P.M. Michel, **D.P. Nicholson**, P.J. Duke, M. Ahmed, K. Manganini, B.G.T. Else, and P.D. Tortell, (2020) River inflow dominates methane emissions in an Arctic coastal system. *Geophys. Res. Lett.* https://doi.org/10.1029/2020GL087669.

[26] Barone, B., **D.P. Nicholson**, S. Ferron, E. Feiring, D.M. Karl. (2019) The estimation of gross oxygen production and community respiration from autonomous time-series measurements in the oligotrophic ocean. *Limnol. Oceanogr. Methods. 17 (12), 650-664.* https://doi.org/10.1002/lom3.10340.

[25] Benway, H. M., L. Lorenzoni, A.E. White, B. Fiedler, N.M. Levine, **D.P. Nicholson**, M.D. DeGrandpre, H. M. Sosik, M.J. Church, T.D. O'Brien, M. Leinen, R.A. Weller, D.M. Karl, S.A. Henson, and R.M. Letelier. (2019) Ocean Time Series Observations of Changing

Marine Ecosystems: An Era of Integration, Synthesis, and Societal Applications, *Front. Mar. Sci.*, 6, https://doi.org/10.3389/fmars.2019.00393.

[24] †Manning, C.C., R. H. R. Stanley, **D. P. Nicholson**, B. Loose, A. Lovely, P. Schlosser, and B. G. Hatcher (2019) Changes in gross oxygen production, net oxygen production, and air-water gas exchange during seasonal ice melt in the Bras d'Or Lake, a Canadian estuary. *Biogeosciences.* https://doi.org/10.5194/bg-2017-428

[23] R.C. Hamme, **D.P. Nicholson**, W.J. Jenkins and S.R. Emerson (2019) Using Noble Gases to Assess the Ocean's Carbon Pumps. *Annu. Rev. Mar. Sci. 11:18.1–18.29.* https://doi.org/10.1146/annurev-marine-121916-063604

[22] **Nicholson, D.P.**, A.P.M Michel, S.D. Wankel, K. Manganini, R.A. Sugrue, Z.O. Sandwith, S.A. Monk (2018) Rapid Mapping of Dissolved Methane and Carbon Dioxide in Coastal Ecosystems using the ChemYak Autonomous Surface Vehicle. *Environ. Sci. Technol.* https://doi.org/10.1021/acs.est.8b04190

[21] **Nicholson, D.P.,** R.H.R. Stanley, S.C. Doney (2018). A Phytoplankton Model for the Allocation of Gross Photosynthetic Energy Including the Trade-offs of Diazotrophy. *J. Geophys. Res., Biogeosciences.* 2017JG004263. https://doi.org/10.1029/2017JG004263.

[20] Martínez-García, S., R.R. Bidigare, D.A. del Valle, L.W. Juranek, **D.P. Nicholson**, D.A. Viviani, S.T. Wilson, M.J. Church (2018) Control of net community production by microbial community respiration at Station ALOHA, *J. Mar. Sys.,* https://doi.org/10.1016/j.jmarsys.2018.03.007.

[19] †Palevsky, H.I. and **D.P. Nicholson** (2018) The North Atlantic biological pump: Insights from the Ocean Observatories Initiative Irminger Sea Array, *J. Oceanography.* https://doi.org/10.5670/oceanog.2018.108.

[18] Long, M.H. and **D.P. Nicholson** (2018) Air-Sea Gas Exchange Determined from an Aquatic Eddy Covariance Floating Platform. *Limnol.Oceanogr. Methods,* https://doi.org/10.1002/lom3.10233.

[17] †Manning, C.C., E.M Howard, **D.P. Nicholson**, B. Ji, Z.O. Sandwith, and R.H.R. Stanley (2017) Revising estimates of aquatic gross oxygen production by the triple oxygen isotope method to incorporate the local isotopic composition of water. *Geophys. Res. Lett.*, 2017GL074375. https://doi.org/10.1002/2017GL074375

[16] **Nicholson, D. P.** and M. Feen (2017) Air calibration of an oxygen optode on an underwater glider, *Limnol. Oceanogr. Methods*, https://doi.org/10.1002/lom3.10177

[15] †Manning, C. C., R. H. R. Stanley, **D.P. Nicholson**, J. M. Smith, J. T. Pennington, M. R. Fewings, M. E. Squibb, F. P. Chavez. (2017). Impact of recently upwelled water on productivity investigated using in situ and incubation-based methods in Monterey Bay. *J. Geophys. Res. Oceans*, https://doi.org/10.1002/2016JC012306

[14] Palevsky, H. I., P. D. Quay, and **D. P. Nicholson** (2016), Discrepant estimates of primary and export production from satellite algorithms, a biogeochemical model, and geochemical tracer measurements in the North Pacific Ocean, *Geophys. Res. Lett.*, *43*(16), 2016GL070226, https://doi.org/10.1002/2016GL070226

[13] †Manning, C. C., R. H. R. Stanley, **D. P. Nicholson**, and M. E. Squibb (2016), Quantifying air-sea gas exchange using noble gases in a coastal upwelling zone, *IOP Conf. Ser. Earth Environ. Sci.*, *35*(1), 012017, https://doi.org/10.1088/1755-1315/35/1/012017

[12] **Nicholson, D. P.**, S. Khatiwala, and P. Heimbach (2016), Noble gas tracers of ventilation during deep-water formation in the Weddell Sea, *IOP Conf. Ser. Earth Environ. Sci.*, *35*(1), 012019, https://doi.org/10.1088/1755-1315/35/1/012019

[11] †Palevsky, H. I., P. D. Quay, D. E. Lockwood, and **D. P. Nicholson** (2016), The annual cycle of gross primary production, net community production and export efficiency across the North Pacific Ocean, *Global Biogeochem. Cycles*, 2015GB005318, https://doi.org/10.1002/2015GB005318

[10] **Nicholson, D. P.**, S.T. Wilson, S.C. Doney, and D.M Karl (2015) Quantifying subtropical North Pacific gyre mixed layer primary productivity from Seaglider observations of diel oxygen cycles, *Geophys. Res. Lett.*, 42(10), 2015GL063065, https://doi.org/10.1002/2015GL063065, 2015.

[9] Wilson, S. T., B. Barone, F. Ascani, R. R. Bidigare, M. J. Church, D. A. del Valle, S. T. Dyhrman, S. Ferrón, J. N. Fitzsimmons, L. W. Juranek, Z. S. Kolber, R. M. Letelier, S. Martínez-García, **D. P. Nicholson**, K. J. Richards, Y. M. Rii, M. Rouco, D. A. Viviani, A. E. White, J. P. Zehr, and D. M. Karl (2015), Short-term variability in euphotic zone biogeochemistry and primary productivity at Station ALOHA: A case study of summer 2012, *Global Biogeochem. Cycles*, 2015GB005141, https://doi.org/10.1002/2015GB005141.

[8] **Nicholson, D.P.**, R. H. R. Stanley, and S. C. Doney (2014), The triple oxygen isotope tracer of primary productivity in a dynamic ocean model, *Global Biogeochem. Cycles*, *28*(5), 2013GB004704, https://doi.org/10.1002/2013GB004704.

[7] **Nicholson, D.P.**, R. H. R. Stanley, E. Barkan, D. M. Karl, B. Luz, P. D. Quay, and S. C. Doney (2012), Evaluating triple oxygen isotope estimates of gross primary production at the Hawaii Ocean Time-series and Bermuda Atlantic Time-series Study sites, *J. Geophys. Res. Oceans*, https://doi.org/10.1029/2010JC006856.

[6] **Nicholson, D. P.** (2011), Comment on: "Technical note: Consistent calculation of aquatic gross production from oxygen triple isotope measurements" by Kaiser (2011), *Biogeosciences*, *8*(10), 2993–2997, https://doi.org/10.5194/bg-8-2993-2011.

[5] **Nicholson, D.P.**, S. R. Emerson, S. Khatiwala, R. C. Hamme. (2011) An inverse approach to estimate bubble-mediated air-sea gas flux from inert gas measurements. *Proceedings on the 6th International Symposium on Gas Transfer at Water Surfaces.* (pp. 223-237) Kyoto University Press.

[4] **Nicholson, D.P**, S. R. Emerson, N. Caillon, J. Jouzel, and R. C. Hamme (2010), Constraining ventilation during deep-water formation using deep-ocean measurements of the dissolved gas ratios $^{40}Ar/^{36}Ar$, N_2/Ar and Kr/Ar, *J. Geophys. Res. Oceans*, *115*(C11), C11015, https://doi.org/10.1029/2010JC006152.

[3] **Nicholson, D.P**., S. R. Emerson, and C. C. Eriksen (2008), Net community production in the deep euphotic zone of the subtropical North Pacific gyre from glider surveys, *Limnol. Oceanogr.*, *53* (5 part 2), 2226–2236, https://doi.org/10.4319/lo.2008.53.5_part_2.2226.

[2] Emerson, S. R., C. Stump, and **D.P. Nicholson** (2008), Net biological oxygen production in the ocean: Remote in situ measurements of O_2 and N_2 in surface waters, *Global Biogeochem. Cycles*, *22*, GB3023, https://doi.org/10.1029/2007GB003095.

[1] **Nicholson, D.P.**, S. Dyhrman, F.P. Chavez and A. Paytan. (2006) Alkaline phosphatase activity in the phytoplankton communities of Monterey Bay and San Francisco Bay. *Limnol. Oceanogr.* 51(2), 874-883, https://doi.org/10.4319/lo.2006.51.2.0874

OTHER PRODUCTS

McCarty, B. J., Mahadevan, A., Matrai, P., McGillicuddy, D. J., Rousseaux, C. S., Siegel, D., Churnside, J. H., Hu, Y., **Nicholson, D.**, and Thompson, A. F. (2023) Reports From EXPORTS Modeling and Data-Mining Activities.

Erickson, Z. K., Fields, E., Omand, M. M., Johnson, L., Thompson, A. F., D'Asaro, E., Carvalho, F., Dove, L. A., Lee, C. M., and **Nicholson, D. P.** (2022) NASA/TM–20220009705: EXPORTS North Atlantic Eddy Tracking, 2022.

Chapter 7: In Situ Gross Primary Production from Triple Oxygen Isotopes. R.H.R. Stanley, L.W. Juranek and **D. P. Nicholson**. In IOCCG (2022) Ocean Optics and Biogeochemistry Protocols for Satellite Ocean Colour Sensor Validation Volume 7.0. Aquatic Primary Productivity Field Protocols for Satellite Validation and Model Synthesis. (eds. Vandermeulen, R.A., Chaves, J. E.). Dartmouth, NS, Canada, International Ocean-Colour Coordinating Group (IOCCG), 201pp. (IOCCG Protocols Series, Volume 7.0). DOI: http://dx.doi.org/10.25607/OBP-1835

Chapter 8: In Situ Net Community Production with dissolved O_2/Ar. L.W. Juranek, R.H.R. Stanley and **D. P. Nicholson**. In IOCCG (2022) Ocean Optics and Biogeochemistry Protocols for Satellite Ocean Colour Sensor Validation Volume 7.0. Aquatic Primary Productivity Field Protocols for Satellite Validation and Model Synthesis. (eds. Vandermeulen, R.A., Chaves, J. E.). Dartmouth, NS, Canada, International Ocean-Colour Coordinating Group (IOCCG), 201pp. (IOCCG Protocols Series, Volume 7.0). DOI: http://dx.doi.org/10.25607/OBP-1835

Chapter 10: Autonomous Platforms. **D.P. Nicholson**, A.J. Fassbender, M.M. Carranza and I. Cetinic. In IOCCG (2022) Ocean Optics and Biogeochemistry Protocols for Satellite Ocean Colour Sensor Validation Volume 7.0. Aquatic Primary Productivity Field Protocols for Satellite Validation and Model Synthesis. (eds. Vandermeulen, R.A., Chaves, J. E.). Dartmouth, NS, Canada, International Ocean-Colour Coordinating Group (IOCCG), 201pp. (IOCCG Protocols Series, Volume 7.0). DOI: http://dx.doi.org/10.25607/OBP-1835

Hamme, R. C., W.J. Jenkins, S.R. Emerson, and **D.P. Nicholson** (2018). A compilation of dissolved noble gas and N_2/Ar ratio measurements collected from 1999-2016 in locations spanning the globe [Data set]. https://doi.org/10.1575/1912/bco-dmo.744563.

Bushinsky, S. M., R.C. Hamme, **D.P. Nicholson**, & K.S. Johnson (2017). Oxygen Measurements from Autonomous Vehicles: Applications and Challenges, 11. In ALPS II: Autonomous and Lagrangian Platforms and Sensors.

Buesseler, K. O., A. Adams, J.G. Bellingham, M. Dever, V.P. Edgcomb, M.L. Estapa, A. Frank, S.M. Gallager, A.F. Govindarajan, T. J. Horner, J. Hunter, M. V. Jakuba, J. Kapit, K. Katija, G.L. Lawson, Y. Lu, A. Mahadevan, **D.P. Nicholson**, M.M. Omand, H. I. Palevsky, C. Rauch, H. M. Sosik, K. M. Ulmer, E. Wurgaft and D.R. Yoerger (2017). *Pump it Up workshop report* (Working Paper). Woods Hole Oceanographic Institution. https://doi.org/10.1575/1912/9328

Manning, C. C., and **D.P. Nicholson** (2016). gas_toolbox: MATLAB code used in Manning et al. GTWS-7 proceedings. Presented at the Gas Transfer at Water Surfaces, Seattle, WA. https://doi.org/10.5281/zenodo.45293

Sabine, C. L., L. Juranek, C. Lee, **D.P. Nicholson**, and A. Ver. (2004). Understanding North Pacific carbon cycle changes. *Eos, Transactions American Geophysical Union*, *85*(42), 419–421. https://doi.org/10.1029/2004EO420006

PROFESSIONAL ACTIVITIES

† - indicates that participation was invited/competitively selected

Outside WHOI:
- † Ocean Carbon and Biogeochemistry Steering Committee (2023-Present)
- † GO2DAT Steering Committee (2022-Present)
- † Kavli Frontiers of Science Fellow (2022), Irvine, CA
- Ocean Sciences Meeting Session Organizer (2022), Virtual
- GO-BGC CLIVAR/OCB Workshop Organizing Committee (2021) Virtual
- † NASA/IOCCG Aquatic Primary Productivity Workshop (Dec 2018 – 2022)
- †BCO-DMO Strategic Planning Committee (Summer 2018 – Present)
- MIT Kaufman Certificate Teaching Program (Spring, 2018)
- †OCB Ocean Time Series Committee Member (2016 – Present)
- †NSF COME-ABOARD workshop organizing committee (2016), Honolulu, HI
- †NASA EXPORTS Science Definition Team Member (2015-2016)
- Contributor: QARTOD Manual for Real-Time Quality Control of Dissolved Oxygen Observations
- †Ocean Science Meeting Session Organizer. (48 – Ocean Primary Productivity: Variability and Influence.) Honolulu, HI, (2014).
- †PICES/ICES Young Investigators Symposium (2012) Mallorca, Spain
- †Dissertations Symposium on Chemical Oceanography (DISCO) (2008) Honolulu, HI
- †Surface Ocean Lower Atmosphere Studies (SOLAS) Summer School. (2007) Corsica, France.

At WHOI:
- Ocean Vital Signs Network Initial Framing Committee Co-Chair (2022-2023)
- WHOI High Performance Computing Advisory Committee (2020 – Present)
- AVAST Building committee and Advisory committee member (2019-Present)
- MIT/WHOI Joint Program Admissions Committee (2013-2016, 2020)
- General Exam organizer for Joint Program Chemistry Students (2015)
- Panel reviewer for internal proposals
- Participant in WHOI OCCI Workshops
- Organizer MCG Department Seminar Series (2013-2015)
- Organizer for OCCI Lecture Series on Southern Ocean and Climate (2011)

TEACHING

Fall 2018 **Modeling, Data Analysis, and Numerical Techniques for Geochem.** Fall 2020
12.747 – co-taught with David Glover (2018), Heather Kim (2020)
WHOI/MIT Joint Program, Woods Hole, MA

Spring 2006 **TA, The Carbon Cycle and Greenhouse Gases**
University of Washington, Seattle, WA

Spring 2003	**TA, Introductory Geology** Stanford University, Stanford, CA
Fall 2002	**TA, Scientific Writing in Earth Sciences** Stanford University, Stanford, CA

MENTORSHIP

Advisor:

Postdoctoral:

Robert Izett, OFI Postdoc, Dalhousie (2022-2023) co- w/Katja Fennel
Alice Ren, Postdoctoral Scholar (2022-Present) co- w/Robert Todd
Mathieu Dever, Postdoctoral Investigator (2017-2019) co w/ Amala Mahadevan
Hilary Palevsky, Postdoctoral Scholar (2016-2018)

Graduate:

Perrin Davidson, WHOI-MIT Joint Program Ph.D. candidate (2022 – Present) co- w/ Alan Seltzer
Ellen Park, WHOI-MIT Joint Program Ph.D. candidate. (2020 – Present)
Shawnee Traylor, WHOI-MIT Joint Program Ph.D. candidate (2019 – Present)
Tyler Rohr, WHOI-MIT Joint Program Ph.D. (2017 – 2019) co- w/Scott Doney
Cara Manning, WHOI-MIT Joint Program Ph.D. (2014 – 2017) co- w/Rachel Stanley

Undergraduate:

Anabella Amato, UCLA (WHOI Summer Student Fellow (2022)
Perrin Davidson, U. Chicago (Guest Student) 2020, 2021
William Pardis, Montana St. (WHOI Summer Student Fellow) 2018
Beth Connors, UC Berkeley (Guest Student) 2018
Kanieka Neal, U Maryland Eastern Shore (WHOI Summer Student Fellow) 2017
Rebecca Sugrue, MIT (WHOI Summer Student Fellow) 2016
Melanie Feen, Skidmore College (WHOI Winter Term and Sumer Guest Student) 2016
Alexis Wood, Stanford University (WHOI Summer Student Fellow) 2014
Cole Stites-Clayton, Stanford University (Guest Student) 2012

Committee Member:

Samantha Clevenger, 2020 – Present
Beckett Colson 2019 – 2022
Cara Manning, 2013 – 2014

Other Mentorship Activities:

ASLO Meeting Mentorship Program. Feb 2019
WHOI-MIT Joint Program Class of 2014 Faculty Mentor for Chemical Oceanography
Ocean Science Meeting Mentorship Program. 2014

ORAL PRESENTATIONS

** indicates invited presentation*

*Kavli Frontiers of Science Symposium, July 2022, Irvine, CA. Observing the ocean carbon cycle

Ocean Sciences Meeting, February 2022, Virtual. Nitrous oxide predicted from merged BGC Argo and GO-SHIP observations

*Euro Argo BGC/Deep Argo Workshop, Oct. 2021, Virtual. Multi-platform investigations of oxygen in the subpolar North Atlantic

Ocean Sciences Meeting, February 2020, San Diego, CA. The seasonal progression of rates of productivity and export from the North Pacific NASA EXPORTS field study as observed by autonomous assets.

*OceanObs19 Meeting, Sept. 2019, Honolulu, HI. EXPORTS: A project shedding light on carbon export processes in the ocean (NASA Hyperwall presentation),

*ExxonMobil–WHOI Joint Workshop, Mar 2019 The carbon cycle as seen from the NASA EXPORTS program

ASLO Aquatic Science Meeting, Feb 2019, San Juan, PR. The annual cycle of the biological carbon pump in the Irminger Sea.

*NASA/IOCCG Aquatic Primary Productivity Workshop, Columbia, MD. Dec 2018 "Scaling up: Autonomous in situ budgets of Productivity"

*SMAST Seminar Series November 2018, UMASS, Dartmouth, MA. Assessing rates of ocean productivity using autonomous platforms

*The Ocean Outlook Conference, May 2018, Woods Hole, MA. The North Atlantic Biological Carbon Pump

Coastal and Estuarine Research Federation, November 2017, Providence RI. The Coastal Carbon Jetyak

WHOI Summer Student Fellow speaker series, June 2017, Woods Hole, MA. New technology for mapping greenhouse gas fluxes across the river to sea continuum

*OCB Summer Workshop, July, 2016. Woods Hole, MA. Introduction and overview of EXPORTS Science Plan in context of NASA mission

Ocean Sciences Meeting, February 2016. Honolulu, HI. Biogeochemistry from Gliders at the Hawaii Ocean Times-Series

Ocean Sciences Meeting, February 2016. Honolulu, HI. The Metabolic Tradeoffs of Diazotrophy in a Flexible Phytoplankton Cell Allocation Model

Fall AGU Meeting December 2015, San Francisco, CA. Subtropical Productivity from Profiling Floats and Gliders

Gas Transfer at Water Surfaces, May 2015, Seattle, WA. Noble gas tracers of ventilation during deep-water formation

Ocean Sciences Meeting, February 2014, Honolulu, HI. Noble gas constraints on bubble-mediated air-sea gas flux.

NCAR ASP Colloquium Carbon-Climate Connections in the Earth System, August 2013, Boulder, CO. A cellular allocation modeling approach for representing the ecophysiology of marine primary producers.

Liege Colloquium: Primary Production in the Ocean, May 2013, Liege, Belgium. Dissolved gas tracers of gross primary production and net community production: perspectives from a global ecosystem and biogeochemistry model.

*Bigelow Laboratory for Ocean Sciences, April 2011, Boothbay Harbor, Me. Applying Dissolved Gas Tracers to Constrain the Ecophysiology of Ocean Primary Productivity

ASLO Aquatic Sciences Meeting, February 2011, San Juan, Puerto Rico. Evaluating triple oxygen isotope tracer estimates of gross primary production at the Hawaii Ocean Time-series and Bermuda Atlantic Time-series Study sites.

*Lamont Doherty Earth Observatory Geochemistry Seminar, February 2011, New York, NY Evaluating isotopic tracers of primary production in the ocean

6th International Symposium on Gas Transfer at Water Surfaces, May 2010, Kyoto, Japan. Parameterizing bubble-mediated gas fluxes using observations and modeling of inert gases in the deep ocean

AGU Ocean Sciences Meeting, February 2010, Portland, OR. Constraining ventilation during deep water formation using deep ocean inert gas measurements.

University of Washington Chemical Oceanography Seminar, May 2009, Seattle, WA. Inert gas tracers of ventilation during deep-water formation

*M.I.T. Earth and Planetary Sciences PAOC Lunch Seminar, April 2009, Cambridge, MA Constraining ventilation during deepwater formation using deep-ocean measurements of the inert gas ratios $^{40}Ar/^{36}Ar$, Kr/Ar, N_2/Ar

Dissertations in Chemical Oceanography, October 2008, Honolulu, HI. Quantifying net community production and the influence of Rossby waves at Station Aloha using autonomous Seagliders

1st Graduate Climate Conference, April 2006, Seattle, WA. Biologically produced oxygen in the subtropical North Pacific

AGU/ASLO Ocean Sciences Meeting, February 2006, Honolulu, HI. Biologically produced oxygen in the subtropical North Pacific: a 4-D Seaglider survey of oxygen, temperature and salinity.

POSTER PRESENTATIONS

7th International Argo Meeting. Oct 2022. ER. Park, **DP Nicholson**. An Oxygen Mass Balance of the Labrador Sea from Biogeochemical Argo Float and Hydrographic Data

7th International Argo Meeting. Oct 2022. S Traylor, Y. Huang, A. Fassbender, **DP Nicholson**. Assessing Integrated Satellite-Float Productivity Estimates in the NASA EXPORTS Campaigns

Living Planet Symposium. May 2022. S Traylor, Y. Huang, A. Fassbender, **DP Nicholson**. Assessing Integrated Satellite-Float Productivity Estimates in the NASA EXPORTS Campaigns

Ocean Sciences Meeting Feb 2022. S Traylor, **DP Nichoson**, E D'Asaro, C. Lee. Autonomous Observations of Net Community Production in the EXPORTS Field Campaigns

OCB Summer Workshop, June 2021. **DP Nicholson** F Carvalho, I Cetinic, E D'Asaro, L Dove, Z Erickson, E Fields, S Henson, L Johnson, C Lee, M Omand, G Shilling, D Siegel, A Thompson, S Traylor. Early results from EXPORTS North Atlantic Autonomous Assets

Ocean Sciences Meeting, Feb 2020. HI Palevsky, **DP Nicholson**, L Wanzer. Annual Oxygen Budget for the Subpolar North Atlantic using Air-calibrated Glider and Mooring Data from the Ocean Observatories Initiative Irminger Sea Array.

Ocean Sciences Meeting, Feb 2020. PE Lerner, A Romanou, **DP Nicholson**, M Kelley, R Ruedy. Pre-Industrial Spin-Up of Dissolved Oxygen in the NASA GISS Model E2. 1, with Emphasis on the Major ODZs.

Ocean Sciences Meeting, Feb 2020. APM Michel, AS Johnson, K Fauria, V Preston, **DP Nicholson**, D Hoer, PR Girguis, SD Wankel. From the Seafloor to the Surface: In situ Chemical Analysis of Rising Bubbles along the Cascadia Margin

Ocean Sciences Meeting, Feb 2020. Y Huang, **DP Nicholson**, B Huang, N Cassar. Machine-learning estimates of global marine gross primary production

Ocean Sciences Meeting, Feb 2018. **DP Nicholson**, APM Michel, SD Wankel, V Preston, R Sugrue, Z Sandwith, and K Manganini. The ChemYak ASV for greenhouse gases and biogeochemistry.

Chemical Oceanography Gordon Conference, July 2017. **Nicholson, DP** and M Feen. Air Calibration of Optodes on Gliders.

OCB Summer Workshop, July, 2015. **Nicholson**, **DP,** R Curry, B Barone, ST. Wilson, SC Doney, DM Karl. Biogeochemistry from gliders at HOT and BATS

Ocean Carbon and Biogeochemistry Summer Meeting, July 2012, Woods Hole, MA. **Nicholson, DP**, RHR Stanley, I Lima and SC Doney Modeling dissolved gas tracers of primary productivity.

PICES/ICES Young Investigators Symposium, April,2012, Mallorca, Spain. **Nicholson, DP**, RHR Stanley, I Lima and SC Doney. Modeling dissolved gas tracers of primary productivity

AGU/ASLO Ocean Sciences Meeting, February 2012, Salt Lake City, UT. **Nicholson, DP**, RHR Stanley, I Lima and SC Doney. Assessing the triple oxygen isotope tracer of photosynthesis in a global model.

Chemical Oceanography Gordon Conference, August 2009, Tilton, NH. **Nicholson, DP**, S Emerson, RC Hamme, N Callion and J Severinghaus. Inert gas tracers of gas exchange during deepwater formation

Fall American Geophysical Union Meeting, December 2008, San Francisco, CA. **Nicholson, DP** and S Emerson. Noble gas constraints on gas exchange during deepwater formation

AGU/ASLO Ocean Sciences Meeting, March 2008, Orlando, FL **Nicholson, DP**, S Emerson, C Stump, CC Eriksen. Net community production in the deep euphotic zone of the subtropical North Pacific from glider surveys: the role of Rossby waves.

2nd Graduate Climate Conference, October 2007, Seattle WA. **Nicholson, DP**, S Emerson, C Stump, CC Eriksen. Biological oxygen production in the subtropical North Pacific gyre from autonomous Seaglider measurements.

Chemical Oceanography Gordon Conference, August, 2007, Tilton, NH. **Nicholson, DP**, S Emerson, C Stump, CC Eriksen. Rossby waves and biological oxygen production in the subtropical North Pacific: observations from the Seaglider.

PICES Line P Symposium, July, 2006, Victoria, Canada. **Nicholson, DP**, S Emerson, CC Eriksen. In Situ measurements of oxygen in the upper ocean: biological productivity on diurnal to annual scales

Fall American Geophysical Union Meeting, December 2002, San Francisco, CA. **Nicholson, DP** and A Paytan. Poster presentation on Alkaline phosphatase activity in Monterey and San Francisco Bays

AGU/ASLO Ocean Sciences Meeting, February 2002, Honolulu, HI. **DP Nicholson** and A Paytan. Poster presentation on methods for quantifying alkaline phosphatase activity

STUDENT AND POSTDOC PRESENTATIONS

[Virtual Poster] Goldschmidt, July 2021. An Observationally Constrained, 234Th-Derived Global POC Flux Model, P. Davidson J. Kenyon, **DP Nicholson**, K. Buesseler

[Oral] Ocean Sciences Meeting, Feb. 2020. Field Evaluation of a Low-cost Multi-gas Biogeochemical Sensor in the Subpolar North Atlantic. S Traylor†, B. Colson, W. Pardis, HI Palevsky, APM Michel, **DP Nicholson**

[Poster] Aquatic Sciences Meeting, Feb 2019. A miniature dissolved multi-gas sensor for aquatic in situ measurement. W. Pardis†, B. Colson, A. Michel, **DP Nicholson**.

[Oral] Ocean Sciences Meeting, Feb. 2018. Seasonal export, thermocline respiration, and winter ventilation in the subpolar North Atlantic. HI Palevsky† and **DP Nicholson.**

[Poster] Chemical Oceanography Gordon Conference, July 2017. R. Sugrue†, A Michel, **DP Nicholson.** Autonomous greenhouse gas sensing with a JetYak.

[Poster] OCB Summer Workshop, June, 2017. M. Dever†, A. Mahadevan, **DP Nicholson**, M Omand. Interactions between submesoscale dynamics and sinking particles: a pre-EXPORTS study.

[Poster] OCB Summer Workshop, July, 2015. Manning, CC†, RHR Stanley, **DP Nicholson**, JM Smith, FP. Chavez , JT Pennington. Net and gross productivity during a Lagrangian experiment in coastal California.

[Poster] Gas Transfer at Water Surfaces, May 2015, CC Manning†, RHR Stanley, **DP Nicholson**. Quantifying air-sea gas exchange and biological productivity during a Lagrangian experiment in coastal California.

[Poster] Fall AGU Meeting, December 2014, Wood, A†, **DP Nicholson** and S Laney**.** Elucidating the springtime North Atlantic phytoplankton bloom and the biological pump from ship of opportunity and satellite data.

† *indicates that author is a current or former advisee*

OTHER ACTIVITIES

REVIEWER

National Science Foundation, NASA, Natural Environment Research Council (UK), European Research Council (EU), Geophys. Res. Letters, Global Biogeochemical Cycles, Biogeosciences, Journal of Geophysical Research – Oceans, Journal of Geophysical Research – Atmosphere, Water Resources Research, Limnology and Oceanography, Deep-Sea Research I, Proceeding of the 6th International Symposium on Gas Transfer at Water Surfaces, Nature Communications, Nature Geosciences, Israel Science Foundation

PROFESSIONAL ORGANIZATIONS

American Geophysical Union
American Society of Limnology and Oceanography
European Geophysical Union
Estuarine Research Federation

FIELD EXPERIENCE

Cambridge Bay High Arctic Research Station. 2022. 14 days
R/V Falkor. 2018. Cascadia Margin. 10 days.
CCGS John P. Tully. 2007. Northeast Pacific. Line Papa Cruise. ~3 weeks
R/V Ka`imikai-o-Kanaloa. 2004. Hawaii Ocean Time-series #162
R/V Point Lobos. 2002-2003. Monterey Bay, CA. Numerous day cruises
R/V New Horizon. 2001. California Margin/Eastern North Pacific. ~2 weeks