

Andrea J. Fassbender

Research Physical Scientist
NOAA Pacific Marine Environmental Laboratory
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EDUCATION

- 2010–2014 Ph.D. Oceanography
University of Washington (UW), School of Oceanography, Advised by Dr. Christopher L. Sabine
Dissertation: New approaches to study the marine carbon cycle
- 2007–2010 M.S. Oceanography
UW School of Oceanography, Advised by Dr. Christopher L. Sabine
- 2007–2009 Graduate Certificate in Climate Science
UW Program on Climate Change
- 2003–2007 B.S. Combined Honors: Chemistry and Oceanography
University of British Columbia, Advised by Dr. Kristin Orians
Thesis: Manganese as a tracer of bottom water renewal in Saanich Inlet, British Columbia

APPOINTMENTS

- 2024–present Adjunct Associate Professor in Ocean Sciences, UC Santa Cruz
- 2021–present Affiliate Assistant Professor in Chemical Oceanography, University of Washington (UW)
- 2020–present Research Physical Scientist, NOAA Pacific Marine Environmental Laboratory (PMEL)
- 2020–2021 Adjunct Scientist, Monterey Bay Aquarium Research Institute
- 2018–2024 Adjunct Assistant Professor in Ocean Sciences, UC Santa Cruz
- 2017–2020 Scientist, Monterey Bay Aquarium Research Institute
- 2014–2016 UCAR Postdoctoral Fellow: Postdocs Applying Climate Expertise; Host: NOAA PMEL
- 2007–2014 Chemical Oceanography Ph.D. Student, UW

PUBLICATIONS

- ‡ Denotes student or postdoc publications for which Fassbender was the primary mentor.
- § Denotes student or postdoc publications for which Fassbender was not the primary mentor but played a substantial role in mentoring the lead author or in developing the paper.
- | Publications in which Fassbender contributed extensively to the conceptual development, analysis, figures, and/or writing.

Submitted Manuscripts

- § Koelling, J., **A.J. Fassbender**, A.R. Gray, G.C. Johnson, and J.D. Sharp. Progressive oxygenation of the North Atlantic subpolar gyre. **In revision at JGR Oceans.**
- | Satterthwaite, E.V., J. Field, **A.J. Fassbender**, S.J. Bograd, K. Barbeau, et al. Large research vessels are essential to marine ecosystem observations and ocean sustainability. **Under review at L&O.** *concept, writing, figures*
- Carter, B.R., J. Schwinger, R. Sonnerup, **A.J. Fassbender**, J.D., and L.M. Dias. Tracer-based Rapid Anthropogenic Carbon Estimation (TRACE). **Under review at EESD.**
- Barrett, R. C., B.R. Carter, **A.J. Fassbender**, B. Tilbrook, R.J. Woosley, K. Azetsu-Scott, A.G. Dickson, R.A. Feely, C. Goyet, M. Ishii, A. Murata, and F.F. Pérez. Biological Responses to Ocean Acidification Are Changing the Global Ocean Carbon Cycle. **In revision at Global Biogeochemical Cycles.**
- ‡ Cornec, M.P. and **A.J. Fassbender**. Accounting for horizontal tracer gradients in biological productivity estimates from semi-Lagrangian platforms. **In revision at JGR Oceans.**
- | Bushinsky, S.M., Z. Nachod, **A.J. Fassbender**, V. Tamsitt, Y. Takeshita, and N. Williams. Offset between profiling float and shipboard oxygen observations at depth imparts bias on float pH and derived $p\text{CO}_2$. **In revision at Global Biogeochemical Cycles.** *concept, figures*

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Stephens, B., Roca-Martí, M., Maas, A., Amaral, V., Clevenger, S., Traylor, S., Benitez-Nelson, C., Boyd, P., Buesseler, K., Carlson, C., Cassar, N., Estapa, M., **Fassbender, A.J.**, *Huang, Y., Lam, P., Marchal, O., Menden-Deuer, S., Paul, N., Santoro, A., Siegel, D., and Nicholson, D.: An upper mesopelagic zone carbon budget for the subarctic North Pacific, **Under review at EGU**sphere.

Refereed Publications ([Google Scholar](#))

– 2024 –

Long, J., Y. Takeshita, J.N. Plant, N. Buzby, **A.J. Fassbender**, and K.S. Johnson. Seasonal biases in fluorescence estimated chlorophyll-a derived from biogeochemical profiling floats (2024). *Communications Earth & Environment*, doi: [10.1038/s43247-024-01762-4](https://doi.org/10.1038/s43247-024-01762-4).

Carter, B.R., J.D. Sharp, M.I. García-Ibáñez, R.J. Woosley, M.B. Fong, M. Álvarez, L. Barbero, S.L. Clegg, R. Easley, **A.J. Fassbender**, X. Li, K.M. Schockman, Z.A. Wang. Random and systematic uncertainty in ship-based seawater carbonate chemistry observations (2024). *Limnology and Oceanography*, doi: [10.1002/lno.12674](https://doi.org/10.1002/lno.12674).

‡ Huang, Y. & **A.J. Fassbender**. Biological production of distinct carbon pools drives particle export efficiency in the Southern Ocean (2024). *Geophysical Research Letters*, doi: [10.1029/2023GL107511](https://doi.org/10.1029/2023GL107511).

§ Carranza, M.M., M.C. Long, A. Di Luca, **A.J. Fassbender**, K.S. Johnson, Y. Takeshita, and N.P. Mongwe. Extratropical storms induce carbon outgassing over the Southern Ocean (2024). *Climate and Atmospheric Science*, doi: [10.1038/s41612-024-00657-7](https://doi.org/10.1038/s41612-024-00657-7).

– 2023 –

Carter, B.R., J.D. Sharp, A.G. Dickson, M. Álvarez, M. Fong, M.I. García-Ibáñez, R. Woosley, Y. Takeshita, L. Barbero, R. Byrne, W.J. Cai, M. Chierici, S. Clegg, R. Easley, **A.J. Fassbender**, K. Fleger, X. Li, M. Martín-Mayor, K. Schockman, and Z.A. Wang. Uncertainty sources for measurable ocean carbonate chemistry variables (2023). *Limnology and Oceanography*, doi: [10.1002/lno.12477](https://doi.org/10.1002/lno.12477).

Fassbender, A.J., B.R. Carter, J.D. Sharp, Y. Huang, M.C. Arroyo, H. Frenzel. Amplified subsurface signals of ocean acidification (2023). *Global Biogeochemical Cycles*, doi: [10.1029/2023GB007843](https://doi.org/10.1029/2023GB007843).

Media: [OCB Science Highlight](#)

| Johnson, G. C., and **A. J. Fassbender**. After Two Decades, Argo at PMEL, Looks to the Future (2023). *Oceanography*, 36(2-3), 54–59, doi:[10.5670/oceanog.2023.223](https://doi.org/10.5670/oceanog.2023.223). *concept, writing, figures*

‡ Sharp, J.D., **A.J. Fassbender**, B.R. Carter, G.C. Johnson, C. Schultz, and J.P. Dunne. GOBAI-O₂: temporally and spatially resolved fields of ocean interior dissolved oxygen over nearly 2 decades (2023). *Earth System Science Data*, doi: [10.5194/essd-15-4481-2023](https://doi.org/10.5194/essd-15-4481-2023).

‡ Xiang, Y., P.D. Quay, R.E. Sonnerup, and **A.J. Fassbender**. Subtropical gyre nutrient cycling: Insights from a nutrient-ratio budget method (2023). *Geophysical Research Letters*, doi: [10.1029/2023GL103213](https://doi.org/10.1029/2023GL103213).

| Rodgers, K.B., J. Schwinger, **A.J. Fassbender**, P. Landschützer, et al. Seasonal variability of the surface ocean carbon cycle: a synthesis (2023). *Global Biogeochemical Cycles*, doi: [10.1029/2023GB007798](https://doi.org/10.1029/2023GB007798). *analysis, writing, figures*

Neibergall, A.K., S. Traylor, Y. Huang, M. Feen, M.G. Meyer, H.M. McNair, D. Nicholson, **A.J. Fassbender**, M.M. Omand, A. Marchetti, S. Menden-Deuer, W. Tang, W. Gong, P. Tortell, R. Hamme, and N. Cassar. Evaluation of new and net community production estimates by multiple ship-based and autonomous observations in the Northeast Pacific Ocean (2023). *Elementa*, doi: [10.1525/elementa.2021.00107](https://doi.org/10.1525/elementa.2021.00107).

‡ Huang, Y., **A.J. Fassbender**, and S.M. Bushinsky. Biogenic carbon pool production maintains the Southern Ocean carbon sink (2023). *PNAS*, doi: [10.1073/pnas.2217909120](https://doi.org/10.1073/pnas.2217909120).

Media: [NOAA Research News](#)

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– 2022 –

‡ Arroyo, M.C., **A.J. Fassbender**, B.R. Carter, C.A. Edwards, J. Fiechter, A. Norgaard, and R.A. Feely. Dissimilar sensitivities of ocean acidification metrics to anthropogenic carbon accumulation in the Central North Pacific Ocean and California Current System (2022). *Geophysical Research Letters*, doi: [10.1029/2022GL097835](https://doi.org/10.1029/2022GL097835)

‡ Sharp, J.D., **A.J. Fassbender**, B.R. Carter, P.C. Lavin, A.J. Sutton. A monthly surface $p\text{CO}_2$ product for the California Current Large Marine Ecosystem (2022). *Earth System Science Data*, doi: [10.5194/essd-14-2081-2022](https://doi.org/10.5194/essd-14-2081-2022)

Fassbender, A.J., S. Sarah Schlunegger, K.B. Rodgers, and J.P. Dunne. Quantifying the role of seasonality in the marine carbon cycle feedback: An ESM2M case study (2022). *Global Biogeochemical Cycles*, doi: [10.1029/2021GB007018](https://doi.org/10.1029/2021GB007018)

‡ Huang, Y., **A.J. Fassbender**, J.S. Long, S. Johannessen, and M. Bif. Partitioning the export of distinct biogenic carbon pools in the Northeast Pacific Ocean using a biogeochemical profiling float (2022). *Global Biogeochemical Cycles*, doi: [10.1029/2021GB007178](https://doi.org/10.1029/2021GB007178)

§ Nickford, S., J.B. Palter, K. Donohue, **A.J. Fassbender**, A.R. Gray, J.S. Long, A.J. Sutton, N.R. Bates, and Y. Takeshita. Autonomous wintertime observations of air-sea exchange in the Gulf Stream reveal a perfect storm for ocean CO_2 uptake (2022). *Geophysical Research Letters*, doi: [10.1029/2021GL096805](https://doi.org/10.1029/2021GL096805)

– 2021 –

Roemmich, D., L. Talley, N. Zilberman, E. Osborne, K.S. Johnson, L. Barbero, H.C. Bittig, N. Briggs, **A.J. Fassbender**, G.C. Johnson, B.A. King, E. McDonagh, S. Purkey, S. Riser, T. Suga, Y. Takeshita, V. Thierry, and S. Wijffels. The technological, scientific, and sociological revolution of global subsurface ocean observing. Pp. 2–8 in *Frontiers in Ocean Observing: Documenting Ecosystems, Understanding Environmental Changes, Forecasting Hazards*. E.S. Kappel, S.K. Juniper, S. Seeyave, E. Smith, and M. Visbeck, eds (2021), A Supplement to *Oceanography* 34(4), doi: [10.5670/oceanog.2021.supplement.02-02](https://doi.org/10.5670/oceanog.2021.supplement.02-02).

| Carter, B.R., H. Bittig, **A.J. Fassbender**, J.D. Sharp, Y. Takeshita, Y. Xu, M. Alvarez, R. Wanninkhof, R. Feely, and L. Barbero. New and Updated Global Empirical Seawater Property Estimation Routines (2021). *Earth System Science Data*, doi: [10.1002/lom3.10461](https://doi.org/10.1002/lom3.10461). *analysis, writing, figures*

‡ Long, J.S., **A.J. Fassbender**, and M.L. Estapa. Depth-resolved net primary production in the Northeast Pacific Ocean: A comparison of satellite and profiling float estimates in the context of two marine heatwaves (2021). *Geophysical Research Letters*, doi: [10.1029/2021GL093462](https://doi.org/10.1029/2021GL093462).

| Siegel, D.A. **et al.** An operational overview of the EXport Processes in the Ocean from RemoTe Sensing (EXPORTS) Northeast Pacific field deployment (2021). *Elementa*, doi: [10.1525/elementa.2020.00107](https://doi.org/10.1525/elementa.2020.00107). *writing, figures*

Fassbender A.J., J.C. Orr, and A.G. Dickson. Technical note: Interpreting pH changes (2021). *Biogeosciences*, doi: [10.5194/bg-18-1407-2021](https://doi.org/10.5194/bg-18-1407-2021).

Media: [EGU Blogs: Biogeosciences & OCB Science Highlight](#)

– 2020 –

‡ Haskell W.Z., **A.J. Fassbender**, J.S. Long, and J.N. Plant. Annual net community production of particulate and dissolved organic carbon from a decade of biogeochemical profiling float observations in the Northeast Pacific (2020). *Global Biogeochemical Cycles*, doi: [10.1029/2020GB006599](https://doi.org/10.1029/2020GB006599).

Media: [OCB Science Highlight](#)

Rodgers, K.B., S. Schlunegger, R.D. Slater, M. Ishii, T.L. Frölicher, K. Toyama, Y. Plancherel, O. Aumont, and **A.J. Fassbender**. Re-emergence of anthropogenic carbon into the ocean's mixed layer strongly amplifies transient climate sensitivity (2020). *Geophysical Research Letters*, doi: [10.1029/2020GL089275](https://doi.org/10.1029/2020GL089275).

Johnson, K.S., M.F. Bif, S.M. Bushinsky, **A.J. Fassbender**, and Y. Takeshita. Biogeochemical Argo [in "State of the Climate in 2019"] (2020). *Bull. Amer. Meteor. Soc.*, 101 (8), S39–S41, doi: <https://doi.org/10.1175/BAMS-D-20-0105.1>.

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Cai, W.J. **et al.** Controls on surface water carbonate chemistry along North American ocean margins (2020). *Nature Communications*, doi: [10.1038/s41467-020-16530-z](https://doi.org/10.1038/s41467-020-16530-z).

Media: [UDaily article](#)

– 2019 –

Sulpis, O., Dofour, C.O., Trossman, D.S., **Fassbender, A.J.**, Arbic, B.K., Boudreau, B.P., Dunne, J.P., and A. Mucci. Decreasing bottom-current speeds and seafloor CaCO₃ dissolution under a business-as-usual scenario (2019). *Global Biogeochemical Cycles*, doi: [10.1029/2019GB006230](https://doi.org/10.1029/2019GB006230).

Todd, R. E., Chavez, F. P., Clayton, S., **et al.**, Global perspectives on observing ocean boundary current systems (2019). *Frontiers in Marine Science*, doi: [10.3389/fmars.2019.00423](https://doi.org/10.3389/fmars.2019.00423).

| Carter, B.R., Williams, N.L., Evans, W., **Fassbender, A.J.**, Barbero, L., Hauri, C., Feely, R.A., and A.J. Sutton. Time-of-emergence as a metric for prioritizing between climate observation quality, frequency, and duration (2019). *Geophysical Research Letters*, doi: [10.1029/2018GL080773](https://doi.org/10.1029/2018GL080773). *concept, writing*

– 2018 –

Fassbender, A.J., Rodgers, K.B., Palevsky, H.I., and C.L. Sabine. Seasonal asymmetry in the evolution of surface ocean pCO₂ and pH thermodynamic drivers and the influence on sea-air CO₂ flux (2018). *Global Biogeochemical Cycles*, doi: [10.1029/2017GB005855](https://doi.org/10.1029/2017GB005855).

Media: [Commentary by Ryan J. Woosley](#)

Fassbender, A.J., Alin, S.R., Feely, R.A., Sutton, A.J., Newton, J.A., Krembs, C., Bos, J., Keyzers, M., Devol, A., Ruef, W., and G. Pelletier. Seasonal carbonate chemistry variability in marine surface waters of the US Pacific Northwest (2018). *Earth System Science Data*, doi: [10.5194/essd-10-1367-2018](https://doi.org/10.5194/essd-10-1367-2018).

Media: [PMEL Monthly Feature Publication](#)

– 2017 –

Feely, R.A., Okazaki, R.R., Cai, W.-J., Bednaršek, N., Alin, S.R., Byrne, R.H., and **A.J. Fassbender**. The combined effects of acidification and hypoxia on pH and aragonite saturation in the coastal waters of the California Current Ecosystem and the northern Gulf of Mexico (2017). *Continental Shelf Research*, doi: [10.1016/j.csr.2017.11.002](https://doi.org/10.1016/j.csr.2017.11.002).

Fassbender, A.J., Palevsky, H.I., Martz, T.R., Ingalls, A.E., Gledhill, M., Fawcett, S.E., Brandes, J.A., Aluwihare, L.I., and the participants of *COME ABOARD* and *DISCO XXV*. Perspectives on Chemical Oceanography in the 21st century: Participants of the COME ABOARD Meeting examine aspects of the field in the context of 40 years of DISCO (2017). *Marine Chemistry*, doi: [10.1016/j.marchem.2017.09.002](https://doi.org/10.1016/j.marchem.2017.09.002).

Fassbender, A.J., Sabine, C.L., and H.I. Palevsky. Nonuniform ocean acidification and attenuation of the ocean carbon sink (2017). *Geophysical Research Letters*, doi: [10.1002/2017GL074389](https://doi.org/10.1002/2017GL074389).

Fassbender, A.J., Sabine, C.L., Cronin, M.F., and A.J. Sutton. Mixed layer carbon cycling at the Kuroshio Extension Observatory (2017). *Global Biogeochemical Cycles*, doi: [10.1002/2016GB005547](https://doi.org/10.1002/2016GB005547).

Media: [OCB & US CLIVAR Research Highlights](#)

Fassbender, A.J., Alin, S.R., Feely, R.A., Sutton, A.J., Newton, J.A., and R.H. Byrne. Estimating total alkalinity in the Washington State coastal zone: Complexities and surprising utility for ocean acidification research (2017). *Estuaries and Coasts*, doi: [10.1007/s12237-016-0168-z](https://doi.org/10.1007/s12237-016-0168-z).

– 2016 –

| Newsom, E.R., **Fassbender, A.J.**, Maloney, A.E., and S.M. Bushinsky. Increasing the usability of climate science in political decision-making (2016). *Elementa: Science of the Anthropocene*, doi: [10.12952/journal.elementa.000127](https://doi.org/10.12952/journal.elementa.000127). *concept, writing*

Media: [UW Today](#)

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Fassbender, A.J., Sabine, C.L., and K.M. Feifel. Consideration of coastal carbonate chemistry in understanding biological calcification (2016). *Geophysical Research Letters*, 43(9), 4467-4476, doi: [10.1002/2016GL068860](https://doi.org/10.1002/2016GL068860).

Media: [Nature Climate Change Research Highlight](#)

Fassbender, A.J., Sabine, C.L., and M.F. Cronin. Net community production and calcification from seven years of NOAA Station Papa Mooring measurements (2016). *Global Biogeochemical Cycles*. doi: [10.1002/2015GB005205](https://doi.org/10.1002/2015GB005205).

Media: [Eos Research Spotlight](#)

– 2015 –

Fassbender, A.J., Sabine, C.L., Lawrence-Slavas, N., De Carlo, E.H., Meinig, C. and S. Maenner Jones. Robust sensor for extended autonomous measurements of surface ocean dissolved inorganic carbon (2015). *Environmental Science & Technology*, doi: [10.1021/es5047183](https://doi.org/10.1021/es5047183).

– 2013 –

Pfeil, B., Olsen, A., Bakker, D. C. E., Hankin, S., Koyuk, H., Kozyr, A., Malczyk, J., Manke, A., Metzl, N., Sabine, C. L., **et al.** A uniform, quality controlled Surface Ocean CO₂ Atlas (SOCAT) (2013). *Earth System Science Data*, doi: [10.5194/essd-5-125-2013](https://doi.org/10.5194/essd-5-125-2013).

| Sabine, C. L., Hankin, S., Koyuk, H., Bakker, D. C. E., Pfeil, B., Olsen, A., Metzl, N., Kozyr, A., **Fassbender, A.J.**, **et al.** Surface Ocean CO₂ Atlas (SOCAT) gridded data products (2013). *Earth System Science Data*, doi: [10.5194/essd-5-145-2013](https://doi.org/10.5194/essd-5-145-2013). *analysis, figures*

– 2011 –

Fassbender, A.J., Sabine C.L., Feely, R.A., Langdon, C., and C.W. Mordy. Inorganic carbon dynamics during northern California coastal upwelling (2011). *Continental Shelf Research*, doi: [10.1016/j.csr.2011.04.006](https://doi.org/10.1016/j.csr.2011.04.006).

Reports and Non-Refereed Publications

Kelly, K.J., Larkin, A.A., Munro, D., Ombres, E., Wright-Fairbanks, L., Feely, R.A., Clevenger, S., Keister, E., and Tedesco, K. – *in collaboration with numerous contributing authors* – (2025). NOAA Oceanic and Atmospheric Research Ocean Carbon Observing Science Plan FY25 to FY30. NOAA Special Report. NOAA, Washington DC. <https://doi.org/10.25923/g4z3-b739>

IOCCG Protocol Series (2022). Aquatic Primary Productivity Field Protocols for Satellite Validation and Model Synthesis. Balch, W.M., Carranza, M., Cetinić, I., Chaves, J.E., Duhamel, S., **Fassbender, A. J.**, Fernandez-Carrera, A., Ferrón, S., García-Martín, E., Goes, J., Gomes, H., Gundersen, K., Halsey, K., Hirawake, T., Isada, T., Juraneck, L., Kulk, G., Langdon, C., Letelier, R., López-Sandoval, D., Mannino, A., Marra, J.F., Neale, P., Nicholson, D., Silsbe, G., Stanley, R.H., Vandermeulen, R.A. IOCCG Ocean Optics and Biogeochemistry Protocols for Satellite Ocean Colour Sensor Validation, Volume 7.0, edited by R.A. Vandermeulen, J. E. Chaves, IOCCG, Dartmouth, NS, Canada. Doi: [10.25607/OBP-1835](https://doi.org/10.25607/OBP-1835).

Media: [Eos Science Update](#)

Schofield, O., **A.J. Fassbender**, M. Hood, K. Hill, and K. Johnson (2022), A global ocean biogeochemical observatory becomes a reality, *Eos*, 103, doi: [10.1029/2022EO220149](https://doi.org/10.1029/2022EO220149).

Fassbender A.J., Bourbonnais A., Clayton S., Gaube P., Omand M., Franks P.J.S., Altabet M.A., and D.J. McGillicuddy Jr., (2018), Interpreting mosaics of ocean biogeochemistry, *Eos*, 99, doi: [10.1029/2018EO109707](https://doi.org/10.1029/2018EO109707).

Fassbender, A.J., J.B. Palter, M.C. Long, T. Ito, S.P. Bishop, and M.F. Cronin, 2018: Ocean Carbon Hot Spots. A Joint US CLIVAR and OCB Workshop Report, 2018-3, 34pp., doi:[10.5065/D6Z036ZS](https://doi.org/10.5065/D6Z036ZS).

Rodgers, K.B., Zhai, P., Iudicone, D., Aumont, O., Carter, B., **Fassbender, A.J.**, Griffies, S.M., Plancherel, Y., Resplandy, L., Slater, R.D., and K. Toyama. “Western boundary currents as conduits for the ejection of anthropogenic carbon from the thermocline”. Joint [US CLIVAR Variations](#) & [OCB News](#) edition entitled *Frontiers in western boundary current research*. Nov. 2017.

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Zhang, D., Cronin, M.F., Lin, X., Inoue, R., **Fassbender, A.J.**, Bishop, S.P., and A.J., Sutton. "Observing air-sea interaction in the western boundary currents and their extension regions: Considerations for OceanObs 2019". Joint [US CLIVAR Variations](#) & [OCB News](#) edition entitled *Frontiers in western boundary current research*. Nov. **2017**.

Qiu, B., Oka, E., Bishop, S.P., Chen, S., and **A.J. Fassbender**. "Decadal variability of the Kuroshio Extension system and its impact on subtropical mode water formation". Joint [US CLIVAR Variations](#) & [OCB News](#) edition entitled *Frontiers in western boundary current research*. Nov. **2017**.

Fassbender, A.J. and C.L. Sabine. "Observing changes in the surface ocean carbon inventory, autonomously". [IMBER Update Newsletter](#). June **2015**.

HONORS & AWARDS

- 2022 2022 NOAA Administrator's award: *For outstanding advances in U.S. Ocean observing and processing of biogeochemical Argo float data, leading to a new era of global oceanography*.
- 2019 [US CLIVAR Early Career Scientist Leadership Award](#)
- 2018 [AGU 2017 Editor's Citation for Excellence in Refereeing - JGR-Oceans](#)
- 2016 Invited Participant, Nominated Meeting Chair, and Writing Lead for an [international effort to synthesize perspectives on the direction of chemical oceanography research](#) coordinated by the U.S. National Science Foundation and National Oceanic and Atmospheric Administration
- 2014 Invited participant: Dissertations in Chemical Oceanography (DISCO) XXIV
- 2014 Best Student Oral Presentation Award at the IMBER Open Science Conference in Bergen, Norway
- 2012–2014 US National Science Foundation IGERT Program on Ocean Change Graduate Fellowship
- 2008–2009 University of Washington Program on Climate Change Graduate Fellowship
- 2007–2008 University of Washington Graduate School Top Scholar Award

SCIENTIFIC LEADERSHIP, MANAGEMENT, & SERVICE

*Science Advisory Roles (*International)*

- 2024–present *U.S. Member, [Biogeochemical Argo Mission Team](#)
- 2024–present Governing Board Member for the [University of Washington Program on Climate Change](#)
- 2020–present Executive Team Member, U.S. [Global Ocean Biogeochemistry Array project](#)
- 2024 *U.S. Subject Matter Expert, [G7 Future of the Seas and Oceans Initiative](#) activity to increase awareness of OneArgo and its impact on the ocean-climate-biodiversity nexus
- 2020–2023 *Co-lead, [REgional Carbon Cycle Assessment and Processes 2](#) chapter synthesizing current understanding of seasonal variability in the ocean carbon cycle
- 2019–2020 Scientific Advisory Board Member, Jupiter Research Foundation [REACT Program](#)
- 2018–2020 Member, U.S. [Ocean Carbon and Biogeochemistry Scientific Steering Committee](#) Early Career (nominated and elected)

Leadership in Community Coordination

- Feb. 2024 **Co-chair** of the Ocean Sciences Meeting **Session:** *Establishing the Scientific Basis for Marine Carbon Dioxide Removal*. New Orleans, LA.

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- May 2023 **Co-chair** of the [Exploring Ocean Iron Solutions \(ExOIS\)](#) Meeting **Session:** *mCDR MRV*. Moss Landing, CA.
- Jan. 2023 **Co-chair** of the Xiamen Symposium on Marine Environmental Sciences (XMAS-VI) **Session:** [Monitoring Ocean Health and Studying the Biological Carbon Pump with the Global Biogeochemical-Argo \(BGC-Argo\) Array](#). **Virtual.**
- June 2022 **Co-organizer** of the NOAA Fisheries-BGC-Argo **Workshop**. San Diego, CA.
- June 2021 **Co-chair** of the joint sponsored U.S. CLIVAR & OCB [GO-BGC Scientific Workshop: Building a Community of Biogeochemistry Float Data Users](#). **Virtual.**
- May 2021 **Co-chair** of [The Global Biogeochemical Argo Fleet: Knowledge to Action Workshop](#), a G7 Future of the Seas and Oceans Initiative event led by the U.S. NSF, NOAA, and NASA.
Media: [Eos feature article](#)
- Feb. 2020 **Co-chair** of the Ocean Sciences Meeting **Session:** *Seasonal Cycles of Ocean Biogeochemistry and Ecosystems Under a Changing Climate*. San Diego, CA.
- June 2019 **Co-chair** of the [OCB Summer Workshop](#) **Session:** *Calcification and the Carbon Cycle*. Woods Hole, MA.
- Feb. 2018 **Co-chair** of the Ocean Sciences Meeting **Session:** *Spatial and Temporal Variability of Seawater Chemistry in Coastal Ecosystems in the Context of Global Change*. Portland, OR.
- Sept. 2017 **Co-chair** of the joint U.S. CLIVAR & OCB [Ocean Carbon Hot Spots Workshop](#) held at the Monterey Bay Aquarium Research Institute. Moss Landing, CA.
Synthesis: [U.S. CLIVAR Variations & OCB News Edition](#)
- June 2017 **Co-chair** of the [OCB Summer Workshop](#) **Session:** *Physical-Biological-Biogeochemical Interactions*. Woods Hole, MA.
Media: [Eos feature article](#)
- Oct. 2016 **Chair** of the *Chemical Oceanography MEeting: A Bottom-up Approach to Research Directions (COME ABOARD)*. An [international effort to synthesize perspectives on the direction of chemical oceanography research](#) coordinated by the U.S. National Science Foundation and National Oceanic and Atmospheric Administration. Honolulu, HI.
Synthesis: [Community publication](#)
- 2012–2013 **Co-organizer** of the University of Washington *IGERT Program on Ocean Change Winter Seminar Series*. Seattle, WA.
- 2009–2010 Co-organizer of the 4th *Graduate Climate Conference*. Pack Forest, WA.

Academic Service: Formal Mentorship Roles

The list does not include the sustained, informal mentorship Fassbender has provided to many early career scientists.

UW: University of Washington

CICOES: Cooperative Institute for Climate, Ocean, & Ecosystem Studies

MBARI: Monterey Bay Aquarium Research Institute

UCSC: University of California Santa Cruz

- 2023–present Co-Mentor, CICOES Postdoctoral Fellow *Jannes Koelling*
- 2023–present Mentor, UW Graduate Student *Stevie Walker*
- 2023–present Committee Member, UW Graduate Student *Reese Barrett*
- 2023–present Co-Mentor, UW Graduate Student *Mary Margaret Stoll*
- 2022–present Co-Mentor, CICOES Postdoctoral Fellow *Hannah Joy-Warren*
- 2021–present Mentor, UW Postdoctoral Scholar *Marin Cornec*

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- 2021–present Co-Mentor, UW Graduate Student *Nina Buzby*
- 2020–present Mentor, UCSC Graduate Student *Mar Arroyo*
- Summer 2024 Co-Mentor, PMEL NOAA EPP Fellow *Savannah Stephenson*. Undergraduate senior at Texas A&M University.
- 2021–2024 Co-Mentor, CICOES Postdoctoral Fellow *Yang Xiang*. Soon to be Assistant Professor in the Department of Oceanography & Coastal Sciences at Louisiana State University.
- 2020–2023 Mentor, UCSC Postdoctoral Scholar *Yibin Huang*. Now Associate Professor in Department of Marine Chemistry at Xiamen University.
- 2020–2023 Co-Mentor, CICOES/PMEL Postdoctoral Scholar *Jon Sharp*. Now Research Scientist in group.
- Summer 2023 Co-Mentor, PMEL NOAA Hollings Scholar *Sonja Giardina*. Undergraduate Senior at the University of Hawai‘i at Mānoa.
- Summer 2023 Co-Mentor, PMEL NOAA Hollings Scholar *Isabell Thornberry*. Now Research Technician at University of Michigan.
- Summer 2022 Co-Mentor, PMEL NOAA Hollings Scholar *Reese Barrett*. Now Graduate Student at UW.
- 2018–2021 Mentor, MBARI Research Technician *Jacqueline Long*. Now Director of Data Management and Co-Founder of Submarine Scientific.
- 2020–2021 Mentor, MBARI Postdoctoral Fellow *Magdalena Carranza*. Now Principal Investigator with NorthWest Research Associates.
- Summer 2020 Mentor, MBARI Intern *Addie Norgaard*. Now Graduate Student at University of Alaska Fairbanks.
- Summer 2020 Mentor, MBARI Intern. *Ally Morris*. Now Graduate Student at University of Hawai‘i at Mānoa.
- Summer 2020 Co-Mentor, MBARI Intern *Bruno Lopez*. Present position unknown.
- 2018–2019 Mentor, MBARI Postdoctoral Scholar *William Haskell*. Present position unknown.
- Summer 2018 Mentor, MBARI Intern *Nina Buzby*. Now UW Graduate Student in group.

Academic Service: Invited Seminars

Declined invitations excluded.

Biogeochemical Argo update and Synergies with GO-SHIP. NOAA Ocean Carbon Constraints Workshop, **Boulder, CO**. Oct. 8, **2024**.

Scientific Story Development. UCSC Communicating Research Effectively (CORE) Writing Workshop Series, **Virtual**. Jan. 31, **2024**.

One Vision, One Mission, OneArgo. PMEL 50th Anniversary Symposium. **Seattle, WA**. March 13, **2024**.

REgional Carbon Cycle Assessment and Processes (RECCAP) 2 Seasonal variability of the surface ocean carbon cycle: a synthesis. University of Hawai‘i at Mānoa Chemical Oceanography Seminar, **Honolulu, HI**. Aug. 31, **2023**.

REgional Carbon Cycle Assessment and Processes (RECCAP) 2 Seasonal variability of the surface ocean carbon cycle: a synthesis. University of Washington Chemical Oceanography Seminar, **Seattle, WA**. April 14, **2023**.

Quantifying the role of seasonality in the marine carbon cycle feedback. University of Washington Chemical Oceanography Seminar, **Seattle, WA**. May 13, **2022**.

How do natural and anthropogenic carbon pool interactions alter ocean carbon uptake. Scripps Institution of Oceanography, Geoscience/Marine Chemistry & Geochemistry Seminar. **San Diego, CA**. Dec. 2, **2019**.

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- Interactions between natural and anthropogenic carbon pools alter annual ocean carbon uptake through seasonal processes.* Lawrence Livermore National Lab, Climate Science Seminar. **Livermore, CA.** Aug. 21, **2019.**
- Sensitivity of the ocean carbon sink to natural and anthropogenic carbon cycle interactions.* UC Santa Barbara Interdepartmental Graduate Program in Marine Science Seminar. **Santa Barbara, CA.** April 23, **2019.**
- Chemical feedbacks in the climate system: A modified marine carbon cycle under business-as-usual carbon dioxide emissions.* University of Montana Chemistry Department Seminar. **Missoula, MT.,** October 22, **2018.**
- Natural and Anthropogenic Carbon Cycle Interactions.* Moss Landing Marine Laboratories Seminar Series. **Moss Landing, CA.,** April 12, **2018.**
- Drivers and sensitivities of ocean carbon uptake.* University of California Santa Cruz Spring Seminar Series. **Santa Cruz, CA.** June 2, **2017.**
- Estimating total alkalinity in the coastal zone: considerations, complexities, and the surprising utility for ocean acidification research.* Washington State Department of Ecology Seminar. **Olympia, WA.** Dec. 15, **2015.**
- New approaches to study the marine carbon cycle.* Monterey Bay Aquarium Research Institute. **Moss Landing, CA.** Oct. 21, **2015.**
- New Approaches to Study the Marine Carbon Cycle: results from seven years of daily observations at OSP and KEO.* University of Victoria Chemical Oceanography Seminar, **British Columbia,** Canada. Feb. 27, **2015.**
- The Ocean's role in the global carbon cycle.* University of Washington Marine Biology 250 Guest Lecture, **Seattle, WA.** Aug. 15, **2013.**

Academic Service: Editor and Reviewer Roles

- | | |
|--------------------|---|
| 2018–2019 | Guest Associate Editor for <i>Frontiers in Marine Science</i> Coastal Ocean Processes topic on <i>Spatial and Temporal Variability of Seawater Chemistry in Coastal Ecosystems in the Context of Global Change.</i> |
| 2018 | Co-Guest Editor for Joint U.S. CLIVAR Variations & OCB News Edition on <i>Frontiers in Western Boundary Current Research.</i> |
| Manuscript Reviews | <i>Dr. Fassbender typically conducts 5–7 manuscript reviews per year for a variety of journals:</i> Environmental Science & Technology, Limnology and Oceanography, Deep Sea Research Part I, Marine Chemistry, Global Biogeochemical Cycles, Estuaries and Coasts, Journal of Geophysical Research Oceans, Geophysical Research Letters, Oceanography, AGU Books, Frontiers in Marine Science, AGU Advances, Scientific Reports, Earth System Science Data, Biogeosciences, Science Advances, Nature Communications Earth & Environment, Nature, Nature Climate Change |
| Proposal Reviews | <i>Dr. Fassbender typically conducts 2–5 proposal reviews per year for a variety of funding organizations:</i> Sea Grant, NOAA OAP, NSF-Physical Oceanography, NSF-Chemical Oceanography, NSF-OTIC, Schmidt Ocean Institute, NASA |

Current Memberships in Professional Societies

- | | |
|----------------|---|
| 2020 - present | UW Program on Climate Change, member (currently a Board Member) |
| 2020 - present | Society for Women in Marine Science, Seattle Chapter |
| 2017 - present | Earth Science Women's Network, member |
| 2009 - present | American Geophysical Union, member |

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SOFTWARE TOOLS & DATA PRODUCTS

Fassbender, A.J. (2024). Near-global, upper 2000 m estimates of preindustrial and year 2002 ocean pH, aragonite saturation state, carbon dioxide partial pressure, hydrogen ion concentration, and Revelle factor values, and their total changes caused by anthropogenic carbon accumulation in addition to the component of the changes induced by carbonate system nonlinearities (NCEI Accession 0290073). NOAA National Centers for Environmental Information. Dataset. <https://doi.org/10.25921/rdtr-9t74>.

Sharp, J.D., **A.J. Fassbender**, B.R. Carter, P.C. Lavin, A.J. Sutton (2022). RFR-CCS: A monthly surface $p\text{CO}_2$ product for the California Current Large Marine Ecosystem. Zenodo. <https://zenodo.org/records/6407178>.

Sharp, J.D., **Fassbender, A.J.**, Carter, B.R., Johnson, G.C., Schultz, C., Dunne, J.P. (2022). GOBAI-O₂: A Global Gridded Monthly Dataset of Ocean Interior Dissolved Oxygen Concentrations Based on Shipboard and Autonomous Observations (NCEI Accession 0259304). v1.0. NOAA National Centers for Environmental Information. Dataset. <https://doi.org/10.25921/z72m-yz67>.

Frenzel, H., J. Sharp, **A.J. Fassbender**, N. Buzby (2022). OneArgo-Mat: A MATLAB toolbox for accessing and visualizing Argo data. Zenodo. <https://doi.org/10.5281/zenodo.6588041>

*Frenzel, H., *J. Sharp, **A.J. Fassbender**, N. Buzby, J. Plant, T. Maurer, Y. Takeshita, D. Nicholson, A. Gray (2021). BGC-Argo-Mat: A MATLAB toolbox for accessing and visualizing Biogeochemical Argo data. Zenodo. <https://doi.org/10.5281/zenodo.4971318>. *These authors contributed equally to code development.

TECHNICAL PRESENTATIONS & OUTREACH

Contributed Research Presentations for the Year 2024

List of the (*invited) conference presentations given by Fassbender, and the conference presentations and seminars given by mentees in her group, for the year 2024. Declined and collaborator presentations are not included.

Fassbender, A.J., Carter, B.R., Sharp, J.D., Huang, Y., Arroyo, M.C., and H. Frenzel. *Amplified subsurface signals of ocean acidification and the implications for interior ocean ecosystems*. PICES Meeting. Honolulu, HI. Oct. 31, 2024.

*Joy-Warren, H.L., Nag, A., Jones, D., Gray, A., **Fassbender, A.J.**, and A. Chase. *Observing the connections between phytoplankton community composition and carbon uptake in the Southern Ocean*, SOFLUX Seminar. Virtual. Sept. 19, 2024.

*Koelling, J., **Fassbender, A.J.**, Gray, A.R., Johnson, G.C. and J.D. Sharp. *Gridded BGC-Argo products provide new insight on ventilation in the North Atlantic*. GO-BGC Annual Meeting, Moss Landing, CA. Sept. 2024.

*Cornec, M., **Fassbender, A.J.**, and E. Osborne. *NOAA Adopt-A-Float program: current state and future perspectives*. US Argo Consortium, NOAA-PMEL, Seattle, WA. July 23, 2024.

*Stoll, M.M., **Fassbender, A.J.**, Muhling, B., Lavin, P., Bograd, S., Frenzel, H., and J.D. Sharp. *Leveraging 4-dimensionally mapped ocean biogeochemistry data products to inform species distribution modeling*. PMEL Spring Science Seminar Series. Seattle, WA. June 27, 2024.

Joy-Warren, H.L., Nag, A., Jones, D., Gray, A., and A.J. **Fassbender**. *Observing the connections between phytoplankton community composition and carbon uptake in the Southern Ocean*. SOCCOM Decennial Meeting. Princeton, NJ, June 26, 2024.

Walker, S.L., **Fassbender, A.J.**, and J.D. Sharp. *Evaluating variability of interior ocean regenerated carbon using observationally constrained data products (poster)*. Ocean Carbon and Biogeochemistry Workshop. Woods Hole, MA. June 10, 2024.

*Buzby, N.B., **Fassbender, A.J.**, Gray, A., Cornec, M., Long, J., and E. Park. *Estimating productivity in the North Atlantic using autonomous floats*. BGC Argo Science Weekly Seminar. Virtual. June 5, 2024.

Koelling, J., Gray, A.R. **Fassbender, A.J.** and G.C. Johnson. *Progressive Ventilation of AMOC waters in the subpolar North Atlantic*. Arctic-Subarctic Ocean Fluxes workshop, Halifax, NS, Canada. May 2024.

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- ***Fassbender, A.J.** *Observations and Tools for Studying Ocean Biogeochemistry from the Surface to the Deep*. Joint US CLIVAR-OCB Workshop on Pathways Connecting Climate Changes to the Deep Ocean: Tracing Physical, Biogeochemical, and Ecological Signals from Surface to Deep Sea. Lewes, Delaware. April 23, **2024**.
- Cornec, M., **Fassbender, A.J.**, and N. Buzby. *Insights into seasonal and vertical dynamics of production in the north Atlantic region using Biogeochemical Argo floats (poster)*. Pathways OCB & US CLIVAR workshop, University of Delaware, Lewis, DE. April 23-25, **2024**.
- Walker, S.L., **Fassbender, A.J.**, and J.D. Sharp. *Evaluating variability of interior ocean regenerated carbon using observationally constrained data products (poster)*. US CLIVAR/OCB Pathways Connecting Climate Changes to the Deep Ocean Workshop. Lewes, DE. April 24, **2024**.
- Koelling, J., **Fassbender, A.J.**, Gray, A.R. and G.C. Johnson. *Progressive Ventilation of AMOC waters in the subpolar North Atlantic*. (poster) US CLIVAR/OCB Pathways Connecting Climate Changes to the Deep Ocean Workshop. Lewes, DE. April **2024**.
- Joy-Warren, H.L., Nag, A., Gray, A., and A.J. **Fassbender**. *Deciphering the role of phytoplankton community composition in CO₂ flux and carbon export in the Southern Ocean (poster)*. Pathways Connecting Climate Changes to the Deep Ocean Workshop. Lewes, DE. April 23–25, **2024**.
- ***Fassbender, A.J.**, G.C. Johnson, and the PMEL GOBOP Team. *One Vision, One Mission, OneArgo*. PMEL 50th Anniversary Symposium. Seattle, WA. March 13, **2024**.
- Frenzel, H., Sharp, J., Cornec, M., Huang, Y., and A.J. **Fassbender**. *OneArgo-Mat/R: MATLAB and R toolboxes for accessing and visualizing Argo data (poster)*. PMEL 50th Anniversary Symposium, Seattle, WA. March 14, **2024**.
- Cornec, M., [...], and A.J. **Fassbender**. *Follow a scientific robot that explores the ocean with the NOAA-PMEL Adopt-A-Float program! (poster)*. PMEL 50th Anniversary, University of Washington Center for Urban Horticulture, Seattle, WA, USA. March 14, **2024**.
- Arroyo, M.C. and A.J. **Fassbender**. *Assessing the Influence of Mean-State Biases on Surface pCO₂ Seasonality in Global Ocean Biogeochemical Models (poster)*. Ocean Sciences Meeting 2024. New Orleans, LA. Feb. **2024**.
- Buzby, N.B., **Fassbender, A.J.**, Gray, A., Cornec, M., and J. Long. *Exploring seasonal and vertical dynamics of productivity in the North Atlantic using Biogeochemical Argo floats (poster)*. Ocean Sciences Meeting. New Orleans, Louisiana. Feb. 18-23, **2024**.
- *Arroyo, M.C. and A.J. **Fassbender**. *Global ocean patterns of subsurface ocean acidification*. Environmental Studies & Sciences Seminar at Santa Clara University. Santa Clara, CA. Feb. **2024**.
- *Cornec, M. and A. J. **Fassbender**. *Horizontal tracer gradient correction for net community production from semi-Lagrangian platforms*. SOCCOM weekly webinars. Virtual. Feb. 28, **2024**.
- Cornec, M. and A.J. **Fassbender**. *Horizontal tracer gradient correction for net community production from semi-Lagrangian platforms*. Ocean Science Meeting 2024. New Orleans, LA. Feb. 23, **2024**.
- Giardina, S., Cornec, M., Huang, Y., and A.J. **Fassbender**. *Characterizing differences between coastal and open ocean biological production: A case study in the Chilean region using BGC-Argo floats (poster)*. Ocean Sciences Meeting. New Orleans, LA. Feb. **2024**.
- Thornberry, I., Xiang, Y., Arroyo, M.C., Sharp, J.D., and A.J. **Fassbender**. *Investigating Seasonal Dynamics of the Arabian Sea and Eastern Tropical North Pacific Oxygen Deficient Zones using BGC-Argo Observations*. Ocean Sciences Meeting. New Orleans, LA. Feb. **2024**.
- Koelling, J., **Fassbender, A.J.**, Gray, A.R., Johnson, G.C. and J.D. Sharp. *Quantifying ocean ventilation in deep water formation regions using BGC-Argo*. (poster) Ocean Sciences Meeting. New Orleans, LA. Feb. **2024**.
- Sharp, J.D., **Fassbender, A.J.**, Frenzel, H., Carter, B.R., and G.C. Johnson. *New Opportunities from BGC Argo for Global Mapping of Ocean Biogeochemical Properties*. Ocean Sciences Meeting. New Orleans, LA. Feb. 22, **2024**.

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Xiang, Y., Quay, P.D., Sonnerup, R.E., and A.J. **Fassbender**. *Subtropical gyre nutrient cycling in the upper ocean: Insights from a nutrient-ratio budget method (poster)*. Ocean Sciences Meeting 2024. New Orleans, LA. Feb. 2024.

Joy-Warren, H.L., Nag, A., Jones, D., Gray, A., and A.J. **Fassbender**. *Southern Ocean carbon flux variability: the role of phytoplankton community composition*. Ocean Sciences Meeting. New Orleans, LA. Feb. 22, 2024.

Fassbender, A.J., Carter, B.R., Sharp, J.D., Huang, Y., Arroyo, M.C., and H. Frenzel. *Deep Inequity: Amplified subsurface signals of ocean acidification*. Ocean Sciences Meeting. New Orleans, LA. Feb. 23, 2024.

Public Outreach and Education

- Nov. 14, 2024 NOAAs EPP/MSI Cooperative Science Centers Fall 2024 Climate Change Seminar Series presentation entitled: *The expanding reach of ocean acidification*. Virtual.
- July 9, 2024 NOAA Science Camp Career Spotlight Series. Seattle, WA.
- Mar. 2, 2023 Adopt-A-Float outreach engagement with two Ingraham High School classes
- May 19, 2022 Invited Panelist for CICOES Postdoc Q&A session on lab management
- Sept. 30, 2021 Volunteer for [*Expanding Your Horizons: a career conference for 6th - 12th grade young women*](#) in Stockton, CA.
- Sept. 19, 2020 Volunteer for [*Expanding Your Horizons: a career conference for 6th - 12th grade young women*](#) in Stockton, CA.
- Mar. 4, 2020 Invited outreach presentation for Stanford University undergraduate course entitled: *Earth 1A: Know Your Planet – Research Frontiers*, Stanford, CA.
- Dec. 10-12, 2019 MBARI booth at the 2019 AGU Fall Meeting
- Sept. 18, 2019 MBARI booth at OceanObs'19
- July 2017–2019 MBARI Open House - Chemical Sensors Booth
- Sept. 22, 2018 Volunteer for [*Expanding Your Horizons: a career conference for 6th - 12th grade young women*](#) in Stockton, CA.
- Apr. 20, 2018 Outreach presentation on *Understanding our changing global climate* at the Ainsley House Museum in Campbell, CA.
- Mar. 6, 2015 Volunteer lecture to Central Washington University students visiting NOAA PMEL: *Ocean carbon uptake*.
- July 9 & 16, 2014 Expert panelist for NOAA Science Camp Current Events Panel on Ocean Acidification.
- May–June 2014 Mentor and subject for a 10th grade Nathan Hale student's *Author of Change* project.
- May 20, 2014 Invited outreach presentation at the Art Institute of Seattle: *Ocean Acidification: Impacts in Washington State*.
- July 17, 2013 Panelist for NOAA Science Camp Speed Networking Event.
- June 2007; Feb. 2013 Volunteer judge for Regional Ocean Sciences Bowl (ORCA Bowl).
- Mar. 2, 2012 Volunteer lecture to Central Washington University students visiting NOAA PMEL: *What it's like to be a grad student at UW/NOAA*.
- June 2010 Volunteer science advisor for an 8th grade student from Issaquah, WA,
- Jan. 27, 2010 Invited outreach presentation for the Washington State University Carbon Masters Training Program: *The science behind climate change*.
- Oct. 8, 2009 Invited outreach presentation for the Washington State University Carbon Coaches Training Program: *Global climate change*.