

## CURRICULUM VITAE

### ADAM V. SUBHAS

Chemical Oceanographer  
Associate Scientist  
Woods Hole Oceanographic Institution  
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Woods Hole, MA 02543

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### EDUCATION:

**B.S. Chemistry, biochemistry concentration**  
Haverford College

*September 2005 - May*  
*2009*  
GPA: 3.8

**Ph.D. Geochemistry**

California Institute of Technology  
*Thesis title: Chemical Controls of Calcite Dissolution Kinetics*  
*in Seawater.*  
Advisors: Jess F. Adkins and William M. Berelson (USC)

*September 2011 - May*  
*2017*

### PROFESSIONAL EXPERIENCE:

**Associate Scientist**

*Woods Hole Oceanographic Institution*  
Department of Marine Chemistry and Geochemistry

*Jun 2023 - Present*

**Doherty Faculty DEI Advisor to the Academic programs Office** *October 2020-October 2022*  
*Woods Hole Oceanographic Institution*

**Assistant Scientist**

*Woods Hole Oceanographic Institution*  
Department of Marine Chemistry and Geochemistry

*Apr 2019 –Jun 2023*

**Postdoctoral Scholar**

*Woods Hole Oceanographic Institution*      *mentors: Matt Long, Dan McCorkle, Ann McNichol*  
· At the National Ocean Sciences Accelerator Mass Spectrometry Facility

*October 2017 - April 2019*

**Postdoctoral Investigator**

*California Institute of Technology*

*May 2017 - August 2017*  
*advisors: Jess Adkins and Will Berelson*

**Laboratory Technician**

*California Institute of Technology*

*September 2009 - August 2011*  
*Supervisor: Jess Adkins*

### FELLOWSHIPS, AND AWARDS

**Fellowships**

· Woods Hole Oceanographic Institution / National Ocean Sciences Accelerator Mass Spectrometry Facility Postdoctoral Scholarship *2017-2019*

- Resnick Sustainability Institute Graduate Fellowship. 2015-2017
- NSF Graduate Research Fellowship. 2012-2015

#### **Awards**

- Magna Cum Laude. 2009
- Phi Beta Kappa. 2009
- Eagle Scout. 2005

#### **PROFESSIONAL AFFILIATIONS:**

Member, American Geophysical Union 2014-Present

Member, Geochemical Society 2015-Present

#### **RESEARCH INTERESTS:**

**Topics**                      The marine carbon and alkalinity cycles  
                                      Ocean biogeochemistry  
                                      Calcium carbonate formation and dissolution

**Approaches & Tools**    Process-based experiments and field campaigns  
                                      Carbonate chemistry and isotope tracers  
                                      Novel instrumentation

#### **PROFESSIONAL ACTIVITIES**

##### **WHOI**

- Workplace Climate Committee member 2017-2020
- SciSec member 2020-present
- Ocean Vital Signs Network Initial Framing Committee member Spring 2022
- Ocean Vital Signs Network Science Implementation Team member Winter 2024

##### **Outside WHOI**

- Co-convener of Session 081, 'Towards a mechanistic understanding of marine and terrestrial carbonates: from geochemical proxies to the global carbon cycle, Goldschmidt, Barcelona August 2019
- Ocean Carbon Biogeochemistry workshop panelist on Monitoring, Reporting and Verification for marine carbon dioxide removal, University of Rhode Island. Fall 2022
- Guide to Best Practices for Ocean Alkalinity Enhancement Research workshop participant, Villefranche-sur-mer, France. January 2023
- Northeast Coastal Acidification Network Monitoring Priorities workshop participant, Bourne, MA. October 2023
- Co-convener of Session 'Establishing the scientific basis for marine carbon dioxide removal (mCDR), Ocean Sciences Meeting, New Orleans, LA. February 2024
- Monitoring, reporting, and verification for abiotic marine carbon dioxide removal workshop participant, Yale University, New Haven, CT. May 2024
- International Council for the Exploration of the Sea (ICES) workshop on the interaction of fisheries and marine CDR, organized by NOAA Northeast Fisheries Science Center, workshop presenter and participant. October 2024
- Stanford University Monitoring, Reporting, and Verification for Ocean Alkalinity

- Enhancement Workshop presenter and participant. *January 2025*
- i. Rutgers University Growing Convergence Research: Multiscale Carbon Export, Grazing, and Viruses Workshop. *January 2025*

## **PARTICIPATION IN EDUCATION PROGRAM:**

### **Teaching Experience**

|                                                                                       |                       |
|---------------------------------------------------------------------------------------|-----------------------|
| Co-Instructor (w Andrew Babbin), Marine Chemistry, MIT-WHOI 12.742                    | <i>Fall 2021-2023</i> |
| Co-Instructor, Geodynamics: Ocean-Based Climate Solutions.<br>MIT-WHOI 12.752         | <i>Spring 2022</i>    |
| Guest Lecture, The Physical Basis of Biomineralization, UC Davis GEL232               | <i>Fall 2020</i>      |
| Co-Instructor (w Tristan Horner), Classic Papers in Oceanography<br>MIT-WHOI 12.759   | <i>Spring 2020</i>    |
| Guest Lecture, Marine Sediment Geochemistry. MIT/WHOI joint program                   | <i>Spring 2019</i>    |
| Teaching Assistant, Caltech ESE102: Earth's Oceans                                    | <i>2012-2015</i>      |
| Guest Lecture, Biomineralization. USC GEOL-601                                        | <i>Spring 2014</i>    |
| Co-Instructor (w Stephen Cox and Ken Farley), Caltech GE191: The U-Series Decay Chain | <i>Winter 2013</i>    |

### **Advising and Mentoring**

|                                                                                           |                     |
|-------------------------------------------------------------------------------------------|---------------------|
| Blue Economy Intern Mentor. Colby Firnrohr, CCCC.                                         | <i>Spring 2024</i>  |
| Postdoctoral Investigator Advisor. Lukas Marx, WHOI MCG                                   | <i>2023-present</i> |
| Postdoctoral Scholar Advisor. Mohammed Hashim, WHOI MCG                                   | <i>2022-2025</i>    |
| PEP mentor, Esmeralda Garcia, College of the Holy Cross                                   | <i>Summer 2023</i>  |
| WHOI SSF Mentor. Yasmin Hamilton, Amherst College                                         | <i>Summer 2023</i>  |
| Ph.D. Advisor. Emily Burdige, MIT-WHOI JP, Chemical Oceanography                          | <i>2022-present</i> |
| Ph.D. Advisor. Chloe Dean, MIT-WHOI JP, Chemical Oceanography                             | <i>2021-present</i> |
| Thesis committee member. Brenna Boehman, MIT-WHOI JP,<br>Chemical Oceanography            | <i>2020-present</i> |
| Thesis committee member. Riss Kellogg, MIT-WHOI JP,<br>Chemical Oceanography              | <i>2017-2022</i>    |
| PEP Mentor. Aaron MacDonald, University of Toronto Class of 2024                          | <i>Summer 2022</i>  |
| WHOI SSF Mentor. Daniel Hill, Oberlin College Class of 2021                               | <i>Summer 2020</i>  |
| PEP Mentor. Katherine Muniz, Wellesley College Class of 2023                              | <i>Summer 2020</i>  |
| PEP Mentor. Aundre Jackson, North Carolina Central University Class of 2021               | <i>Summer 2020</i>  |
| Guest student host. Hannah Tandy, UCLA (Advisor: Aradhna Tripathi)                        | <i>Spring 2022</i>  |
| Guest student host. Gilli Edvardson, Open University of Israel<br>(Advisor:Eyal Wurgaft). |                     |
| WHOI Guest Student Mentor. Alex Quizon, Williams College class of 2021                    | <i>Summer 2018</i>  |
| Outreach Educator, Caltech Tectonics Observatory                                          | <i>2011-2012</i>    |

## **SUPERVISION AT WHOI**

Matthew G. Hayden, Senior Research Assistant II, 2022-Present

## **FIELD EXPERIENCE**

**Research cruises (\* denotes Chief Scientist)**

- R/V Connecticut\*. LOC-01, LOC-NESS Project 2 days, September 2023
- R/V Atlantic Explorer. AE2316 July BATS cruise 5 days, July 2023
- R/V Acadiana\*. Mississippi River and Gulf of Mexico. 3 days each, October & May 2022
- R/V Sally Ride. Cocos Ridge, Costa Rica. 31 days, November 2021
- R/V Endeavor\*. Gulf of Maine. Chief Scientist. 5 days, April 2021
- R/V Kilo Moana. Station ALOHA. 10 days, June 2019
- R/V Walton Smith. Lee Stocking Island, Bahamas. 21 days, May 2019
- R/V Kilo Moana. Honolulu, HI to Seward, AK. 30 days, August 2017
- R/V Yellowfin. San Pedro Basin. 2 days, June 2015
- R/V Thomas Thompson, Southern Ocean. 33 days, December 2008

### Other Fieldwork

- OHMSETT large scale test tank facility, Leonardo, NJ Spring 2025
- Marine calcifier culturing at the IUI in Eilat, Israel. Winters 2013, 2014
- Mapping field assistant, Mormon Mountains, Nevada. Spring 2012

### PUBLICATIONS AND PATENTS

**Submitted, In Review, and preprints (\* denotes student/postdoc author; †co-author contributions follow reference.)**

10. Rheuban, J.E., Kim, H.H., Chen, K., Lima, I., McCorkle, D.C., Michel, A.P.M., Wang, Z.A., **Subhas, A.V.** Carbonate system site selection characteristics for ocean alkalinity enhancement in the US northeast shelf and slope. *Submitted to JGR: Biogeosciences*.

9. Bednarsek, N., Armitage, D., Chan, F., Marx, L., Rheuban, J., **Subhas, A.V.** Conducting ocean alkalinity enhancement trials: Integrating multiple perspectives for future research. *Submitted to Environmental Research Letters*.

8. **Subhas, A. V.**, Rheuban, J. E., Wang, Z. A., McCorkle, D. C., Michel, A. P. M., Marx, L., ... Chen, K. (2025). A tracer study for the development of in-water monitoring, reporting, and verification (MRV) of ship-based ocean alkalinity enhancement. *EGUsphere*, 2025, 1–34. doi: [10.5194/egusphere-2025-1348](https://doi.org/10.5194/egusphere-2025-1348)

7. Marx, L., Rheuban, J.E., McCorkle, D.C., Murray, C.S., Guo, Y., Wang, Z.A., Michel, A.P.M., Chen, K., Kim, H., **Subhas, A.V.** Development of the ecological activity index as an integrative ecosystem assessment and monitoring asset for ocean alkalinity enhancement. *Submitted to Nature Sustainability*.

6. Tandy, H. T., Flores, R., **Subhas, A. V.**, Schmidt, D. N., Khan, K. T., Gwak, S., ... Tripathi, A. (2025). *Dissolution effects on clumped isotope signatures in planktic foraminifera*. doi: 10.22541/essoar.173834697.77647113/v1

5. Hashim, M.\*, Marx, L., Klein, F., Dean, C., Burdige, E., Hayden, M., ... **Subhas, A.V.** (2025). Mineral Formation during Shipboard Ocean Alkalinity Enhancement Experiments in the North Atlantic. *EGUsphere*, 2025, 1–31. doi: 10.5194/egusphere-2025-988

4. Guo, Y.\*, Chen, K., **Subhas, A.V.**, Rheuban, J.E., Wang, Z.A., McCorkle, D.C., Michel, A., Kim, H.H. (2025). Site Selection for Ocean Alkalinity Enhancement on the US Northeast Shelf: Perspectives from Passive Tracer Experiments. *In revision at Nature Communications: Earth and Environment*.
3. Kellogg, R.M.\*, Schanke, N.L., Lees, L.E., Chmiel, R.J., Rao, D., Brisbin, M.M., Moran, D.M., McIlvin, M.R., Bolinesi, F., Casotti, R., Balestra, Cl., Horner, T.J., **Subhas, A.V.**, Dubnar, R.B., Allen, A.E., DiTullio, G.R., Saito, M.A. Zinc-iron colimitation of natural marine phytoplankton assemblages in coastal Antarctica. *Under review at Biogeosciences*. <sup>†</sup>Analyzed and interpreted carbonate chemistry data; contributed writing/edits to manuscript.
2. Pallacks, S., Ziveri, P., Jannke, H., Lin, C-H., **Subhas, A.V.**, Galbraith, E., Baath-Bahr, S., Friedrich, O., Bahr, A., Koutsodendris, A., Pross, J., Norris, R. Ocean deoxygenations linked to ancient mesopelagic fish decline. *In revision at Nature Communications Earth and Environment*.
1. Hashim, M. \*, Conte, M., Salter, M., A., Pedrosa-Pamies, R. Weber, J. C., Hayden M., Wilson R., Perry, C., Crowley, S.F., Dennis, P.F., Bish, D., and **Subhas, A.V.** Fish Carbonates in the Open Ocean and Their Role in the Carbon Cycle. *In revision at Global Biogeochemical Cycles*.

## **Published**

34. ICES (2025). Workshop on marine Carbon Dioxide Removal (WKmCDR; outputs from 2024 Meeting). ICES Scientific Reports. Report. [doi: 10.17895/ices.pub.28246358.v3](https://doi.org/10.17895/ices.pub.28246358.v3)
33. Dean, C.L. \*, Harvey, E., Johnson, M., **Subhas, A.V.** Microzooplankton grazing on the coccolithophore *Emiliania huxleyi* and its role in shallow calcium carbonate dissolution. *Accepted in Science Advances*.
32. Dong, S., Pavia, F. J., Subhas, A. V., Gray, W. R., Adkins, J. F., & Berelson, W. M. (2025). Carbon Cycling in Marine Particles Based on Inorganic and Organic Stable Isotopes. *Geochimica et Cosmochimica Acta*, 388, 208–220. doi: 10.1016/j.gca.2024.10.005
31. **Subhas, A.V.**, Rheuban, J.E., Marx, L.M., Michel, A., McCorkle, D., Chen, K., Kim, H.H., Wang, Z.A., and LOCNESS Team. Marine Protection, Research, and Sanctuaries Act Permit Application to conduct a small-scale experiment and deploy monitoring technologies to evaluate the effectiveness and environmental impacts of ocean alkalinity enhancement as a potential carbon dioxide removal and acidification mitigation approach in the waters South of Massachusetts. EPA-HQ-OW-2023-0591-0002 <https://www.regulations.gov/document/EPA-HQ-OW-2023-0591-0004>
30. **Subhas, A.V.**, Rheuban, J.E., Marx, L.M., Michel, A., McCorkle, D., Chen, K., Kim, H.H., Wang, Z.A., and LOCNESS Team. Marine Protection, Research, and Sanctuaries Act Permit Application to conduct a small-scale experiment and deploy monitoring technologies to evaluate the effectiveness and environmental impacts of ocean alkalinity enhancement as a potential carbon dioxide removal and acidification mitigation approach in the Gulf of Maine. EPA-HQ-OW-2024-0189 <https://www.regulations.gov/docket/EPA-HQ-OW-2024-0189>

29. **Subhas, A. V.**, Lehmann, N., & Rickaby, R. E. M. (2023). Natural analogs to ocean alkalinity enhancement. *State of the Planet, 2-oae2023*, 8. doi: 10.5194/sp-2-oae2023-8-2023
28. Jiang, L.-Q., **Subhas, A. V.**, Basso, D., Fennel, K., & Gattuso, J.-P. (2023). Data reporting and sharing for ocean alkalinity enhancement research. *State of the Planet, 2-oae2023*, 13. doi: 10.5194/sp-2-oae2023-13-2023
27. Grubb, A. R. , Johns, C. T., Hayden, M. G., **Subhas, A. V.**, Thamatrakoln, K., & Bidle, K. D. (2024). Calcification increases carbon supply, photosynthesis, and growth in a globally distributed coccolithophore. *Limnology and Oceanography*, 69(9), 2152–2166. doi: 10.1002/lno.12656
26. Hashim, M. S. \*, Kaczmarek, S. E., Naa, G. W., Bish, D. L., & **Subhas, A. V.** (2024). A process-based geochemical framework for carbonate sediments during marine diagenesis. *Geochimica et Cosmochimica Acta*, 376, 54–67. doi: 10.1016/j.gca.2024.05.023
25. Ziveri, P., Gray, W.R., Anglada-Ortiz, G., Manno, C., Grelaud, M., Incarbona, A., Rae, J.W.B., **Subhas, A.V.**, Pallacks, S., White, A., Adkins, J.F., Berelson, W.M. (2023). Pelagic calcium carbonate production and shallow dissolution in the North Pacific Ocean. *Nature Communications*, 14(1), 805. doi: 10.1038/s41467-023-36177-w. †Participated in cruise and sample collection; analyzed and interpreted data; contributed writing/edits to manuscript.
24. Mete, Ö. Z., **Subhas, A. V.**, Kim, H. H., Dunlea, A. G., Whitmore, L. M., Shiller, A. M., ... Horner, T. J. (2023). Barium in seawater: dissolved distribution, relationship to silicon, and barite saturation state determined using machine learning. *Earth System Science Data*, 15(9), 4023–4045. doi: 10.5194/essd-15-4023-2023 †Calculated global distributions and means; analyzed and interpreted data; contributed writing/edits to manuscript.
23. **Subhas, A. V.**, Pavia, F. J., Dong, S., & Lam, P. J. (2023). Global Trends in the Distribution of Biogenic Minerals in the Ocean. *Journal of Geophysical Research: Oceans*, 128(2). doi: 10.1029/2022jc019470
22. Bekaert, D. V., Barry, P. H., Broadley, M. W., Byrne, D. J., Marty, B., Ramírez, C. J., ... Seltzer, A. M. (2023). Ultrahigh-precision noble gas isotope analyses reveal pervasive subsurface fractionation in hydrothermal systems. *Science Advances*, 9(15), eadg2566. doi: 10.1126/sciadv.adg2566. †Measured CO2 samples; analyzed and interpreted data; contributed writing/edits to manuscript.
21. Steiner, Z., Rae, J.W.B., Berelson, W.M., Adkins, J.F., Hou, Y., Dong, S., Lampronti, G.I., Liu, X., Achterberg, E.P., **Subhas, A.V.**, Turchyn, A.V., 2022: Authigenic formation of clay minerals in the abyssal North Pacific. *Global Biogeochemical Cycles*, 36(11), e2021GB007270. doi: 10.1029/2021GB007270 †Participated in cruise and sample collection; analyzed and interpreted data; contributed writing/edits to manuscript.
20. **Subhas, A.V.**, Marx, L., Reynolds, S., Flohr, A., Mawji, E., Brown, P., and Cael., B.B., 2022: Microbial Ecosystem Responses to Alkalinity Enhancement in the North Atlantic Subtropical

Gyre. *Frontiers in Climate: Negative Emissions Technologies*, **4**, 784997. doi: 10.3389/fclim.2022.784997.

19. **Subhas, A.V.**, Dong S., Naviaux, J.D., Rollins, N.E., Ziveri, P., Gray, W.R., Rae, J.W.B., Liu, X., Byrne, R.H., Chen, S., Moore, C., Martell-Bonet, L., Steiner, Z., Antler, G., Hu, H., Lunstrum, A., Hou, Y., Kemnitz, N., Stutsman, J., Pallacks, S., Dugenne, M., Quay, P.D., Berelson, W.M., Adkins, J.F., 2022: Shallow Calcium Carbonate Cycling in the North Pacific Ocean. *Global Biogeochemical Cycles.*, **36**, e2022GB007388. <https://doi.org/10.1029/2022GB007388>.

18. Kellogg, R. M. \*, Moosburner, M. A., Cohen, N. R., Hawco, N. J., McIlvin, M. R., Moran, D. M., DiTullio, G.R., **Subhas, A.V.**, Allen, A.E., Saito, M. A. (2022). Adaptive responses of marine diatoms to zinc scarcity and ecological implications. *Nature Communications*, *13*(1), 1995. doi: 10.1038/s41467-022-29603-y †*Analyzed and interpreted data; contributed writing/edits to manuscript.*

17. Kellogg, R.M.\*, Moran, D.M., McIlvin, M.R., **Subhas, A.V.**, Allen, A.E., Saito, M.A., 2022: Lack of a Zn/Co substitution ability in the polar diatom *Chaetoceros neogracile* RS19. *Limnology and Oceanography*, **67**(10), 2265-2280. doi: 10.1002/lno.12201. †*Analyzed and interpreted data; contributed writing/edits to manuscript.*

16. Dong, S., Wang, X.T., **Subhas, A.V.**, Pavia, F.J., Berelson, W.M., Adkins, J.F., 2022: Suspended carbon and nitrogen along a North Pacific transect: concentrations, isotopes, and C/N ratios. *Limnology and Oceanography* *67*(1), 247-260. †*Participated in cruise and sample collection; analyzed and interpreted data; contributed writing/edits to manuscript.*

15. Adkins, J.F., Naviaux, J.D., **Subhas, A.V.**, Dong, S., Berelson, W.M., 2021: The Dissolution Rate of CaCO<sub>3</sub> in the Oceans. *Annual Review of Marine Science* *13*(1), 57-80. †*Analyzed and interpreted data; contributed writing/edits to manuscript.*

14. **Subhas, A.V.**, McCorkle, D.C., Quizon, A.\*, McNichol, A.P., Long, M.H., 2019: Selective Preservation of Coccolith Calcite in Ontong-Java Plateau Sediments. *Paleoceanography and Paleoclimatology*, **34**(12), 2141-2157.

13. **Subhas, A.V.**, Berelson, W.M., Dong, S., Rollins, N.E., Adkins, J.F., 2019: The Carbonic Anhydrase Activity of Sinking and Suspended Particles in the North Pacific Ocean. *Limnology and Oceanography*, *65*(3), 637-651

12. Naviaux, J.D., **Subhas, A.V.**, Dong, S., Rollins, N.E., Liu, X., Berelson, W.M., Adkins, J.F., Byrne, R.H., 2019: Calcite Dissolution Rates in Seawater: Lab vs. In Situ Measurements and Inhibition by Organic Matter. *Marine Chemistry*, *215*, 103684. †*Contributed to experimental design and execution; participated in cruise and sample collection; analyzed and interpreted data; contributed writing/edits to manuscript.*

11. Dong, S., Berelson, W.M., Rollins, N.E., **Subhas, A.V.**, Naviaux, J.D., Celestian, A.J., Liu, X., Turaga, N., Kemnitz, N.J., Byrne, R.H., Adkins, J.F., 2019: Aragonite Dissolution Kinetics and Calcite/Aragonite Ratios in Sinking and Suspended Particles in the North Pacific. *Earth and*

*Planetary Science Letters*, 515, 1-12. <sup>†</sup>*Contributed to experimental design and execution; participated in cruise and sample collection; analyzed and interpreted data; contributed writing/edits to manuscript.*

10. Naviaux, J., **Subhas, A.V.**, Rollins, N.E., Adkins, J.F., Berelson, W.M., 2019: Temperature Dependence of Calcite Dissolution Kinetics in Seawater. *Geochimica et Cosmochimica Acta*, 246, 363-384. <sup>†</sup>*Contributed to experimental design and execution; analyzed and interpreted data; contributed writing/edits to manuscript.*

9. **Subhas, A.V.**, Adkins, J.F., Erez, J., Ziveri, P., Langer, G., Rollins, N.E., Berelson, W.M., 2018: The dissolution kinetics of biogenic calcites in seawater and a possible role of magnesium and organic carbon. *Marine Chemistry*, 205, 100-112

8. Dong, S., **Subhas, A.V.**, Rollins, N.E., Naviaux, J., Adkins, J.F., Berelson, W.M., 2018: A Kinetic Pressure Effect on Calcite Dissolution in Seawater. *Geochimica et Cosmochimica Acta*, 238, 411-423 <sup>†</sup>*Contributed to experimental design and execution; analyzed and interpreted data; contributed writing/edits to manuscript.*

7. **Subhas, A.V.**, Adkins, J.F., Erez, J., Rollins, N.E., Berelson, W.M., 2017: Catalysis and Chemical Mechanisms of Calcite Dissolution in Seawater, *Proceedings of the National Academy of Sciences*, 114(31), 8175-8180

6. Haynes, L.L., Honisch, B., Dyez, K., Eggins, S., Holland, K., Rosenthal, Y., Fish, C., **Subhas, A.V.**, 2017: Calibration of the B/Ca proxy in the planktic foraminifer *O. universa* to Paleocene seawater conditions, *Paleoceanography*, 32 <sup>†</sup>*Analyzed foraminifera surface areas; analyzed and interpreted data; contributed writing/edits to manuscript.*

5. **Subhas, A.V.**, Rollins, N.E., Berelson, W.M., Dong, S., Erez, J., Adkins, J.F., 2015: Novel Determination of the Dissolution Kinetics of Inorganic Calcite in Seawater. *Geochimica et Cosmochimica Acta*, 170, 51-68

4. Thiagarajan, N., **Subhas A.V.**, Southon, J.R., Eiler, J.M., Adkins, J.F., 2014: Abrupt pre-Bolling-Allerod warming and circulation changes in the deep ocean. *Nature* 511(7507), 75-78 <sup>†</sup>*Measured U/Th disequilibrium ages on samples; analyzed and interpreted data; contributed writing/edits to manuscript.*

3. Paris, G., Sessions, A.L., **Subhas, A.V.**, Adkins, J.F., 2013: Measurement of  $\delta^{34}\text{S}$  and  $\Delta^{33}\text{S}$  in small amounts of dissolved sulfate. *Chemical Geology* 345, 50-61 <sup>†</sup>*Contributed to method development and execution; contributed writing/edits to manuscript.*

2. Thiagarajan, N., Gerlach, D., Roberts, M.L., Burke, A., McNichol, A., Jenkins, W.J., **Subhas, A.V.**, Thresher, R.E., Adkins, J.F. 2013: Movement of deep-sea coral populations on climatic timescales. *Paleoceanography* 28(2), 227-236 <sup>†</sup>*Measured U/Th disequilibrium ages on samples; analyzed and interpreted data; contributed writing/edits to manuscript.*

1. **Subhas, A.V.**, Whealdon, J., Schrier, J., 2011: Predicting organic thin-film transistor carrier

type from single molecule calculations. *Computational and Theoretical Chemistry* 966, 70-74

## PATENTS

1. **Subhas, A.V.**, Berelson, W.M., Rollins, N.E., Adkins, J.F., Erez, J. Method and Apparatus for CO<sub>2</sub> sequestration. *United States Patent* 9,988,653

## PUBLISHED ABSRACTS

**Subhas, A.V.**, Michel, A., Wang, Z.A., Rheuban, J.E., Kim, H.H., Chen, K., McCorkle, D.C., Kapit, J., Dean, C., Marx, L., Hayden, M.G., Morkeski, K., Burkitt-Gray, M., Elder, F. Introducing the LOC-NESS project and results from LOC-01, our first tracer release experiment, 2024, Ocean Sciences Meeting.

Saito, M.A., Kell, R., Chmiel, R., Rao, D., Schanke, N.L., Lees, L., Brisbin, M.M., Moran, D.M., McIlvin, M.R., Bolinesi, F., Mangoni, O., Casotti, R., Horner, T.J., **Subhas, A.V.**, Follows, M., Allen, A.E., Dunbar, R.B., DiTullio, G.R. The interactive influence of the micronutrients Iron, Zinc, and Vitamin B12 on Ross Sea and Amundsen Sea primary productivity, 2024. Ocean Sciences meeting.

Cook, L., Saba, G., Hashim, M., **Subhas, A.V.**, Schwarz, M., Urick, S. Novel quantification of carbon production for a dominant Northwest Atlantic forage fish, Atlantic menhaden (*Brevoortia tyrannus*; family: *Chupeidae*) under ambient conditions, 2024. Ocean Sciences Meeting.

Dean, C.L.\*, **Subhas, A.V.**, Harvey, E. Microzooplankton grazing on the coccolithophore *Emiliana huxleyi* and its role in shallow calcium carbonate dissolution, 2024. Ocean Sciences Meeting.

Marx, L.\*, Dean, C.L., Hayden, M.G., **Subhas, A.V.** A shipboard experimental approach to assessing the effects of ocean alkalinity enhancement on the seawater microbial community and carbon chemistry in the North Atlantic, 2024. Ocean Sciences Meeting.

Garcia, E.\*, **Subhas, A.V.**, Dean, C.L., Hashim, M.H. *Gephyrocapsa oceanica*'s physiological response to alkalinity enhancement in laboratory cultures, 2024. Ocean Sciences Meeting.

Hashim, M.H.\*, **Subhas, A.V.**, Pamies, R.P., Salter, M., Conte, M.H. Non-traditional sources of calcium carbonate in the deep Sargasso Sea, 2024. Ocean Sciences Meeting.

Borer, B., **Subhas, A.V.**, Hayden, M.H., Woosley, R.J., Babbín, A.R. Microbially-mediated shallow calcium carbonate dissolution in marine snow particles: evidence from microfluidic stable isotope experiments, 2024. Ocean Sciences Meeting.

Rheuban, J.E., Kim, H.H., Chen, K., Wang, Z.A., Lima, I.D., **Subhas, A.V.** Site selection characteristics for ocean alkalinity enhancement determined through machine learning, 2024. Ocean Sciences Meeting.

Rafter, P.A., Green, R.A., **Subhas, A.V.**, Hain, M. Carbon isotope fingerprint of ocean alkalinity enhancement, 2024. Ocean Sciences Meeting.

Hamilton, Y.\*, **Subhas, A.V.**, Dean, C.L., Hashim, M.H. Testing the impact of Mg/Ca and  $[\text{SO}_4]^{2-}$  on the growth and calcification of the coccolithophore *Emiliana huxleyi*, 2024. Ocean Sciences Meeting.

Dong, S., Adkins, J.F., Pavia, F.J., **Subhas, A.V.**, Gray, W.R., Berelson, W.M. Carbon cycling in marine particles based on inorganic and organic stable isotopes, 2024. Ocean Sciences Meeting.

Burdige, E.\*, **Subhas, A.V.**, Saito, M.A. High resolution carbonic anhydrase activity depth profiles via membrane inlet mass spectrometry in the Equatorial Pacific, 2024. Ocean Sciences Meeting.

Van Mooy, B.A.S., Bent, S.M., Bidle, K.D., Fredricks, H.F., Holm, H.C., Girard, Z., Krause, J.W., Lowenstein, D., Prakash, M., **Subhas, A.V.**, Thametrakoln, K. Floating fats from phytoplankton affect the fate of carbon, 2024. Ocean Sciences Meeting.

Hashim, M.H.\*, **Subhas, A.V.**, Klein, F. Micro-scale observations and global trends in carbonate diagenesis at the Great Bahama Bank, 2023. Goldschmidt Conference.

Landry, K., Dong, S., Chen, J.J., Kong, T., Rodriguez, D.O., Pavia, F.J., **Subhas, A.V.**, Peng, X.N., Adkins, J.F., Berelson, W.M., Wang, X.T. Equatorward expansion of the North Pacific oxygen-deficient zones over the past three decades, 2023. Goldschmidt Conference.

MacDonald, A.\*, Dean, C., **Subhas, A.V.** *Emiliana Huxleyi* response to ocean alkalinity enhancement in laboratory culture, 2022. AGU Fall Meeting.

**Subhas, A.V.**, Reynolds, S., Marx, L., Flohr, A., Brown, P., Cael, B.B. Microbial ecosystem responses to alkalinity enhancement North Atlantic Subtropical Gyre, 2022. AGU Fall Meeting.

Hashim, M.\*, Naa, G., **Subhas, A.V.**, Kaczmarek, S. A process-based approach to carbonate diagenesis: Back to basics, 2022. AGU Fall Meeting.

Hashim, M. \*, **Subhas, A.V.**, Kaczmarek, S., Naa, G. Simple experiments can shape our understanding of complex processes, 2022. AGU Fall Meeting.

Pallacks, S. \*, Norris, R., Lin, C-H., Jahnke, H., Lombarte, A., **Subhas, A.V.**, Galbraith, E., Ziveri, P., 2022. 14<sup>th</sup> International Conference in Paleoceanography.

Packard, G., Chmiel, R., Codillo, E., Ma, L., Nevarez, N., **Subhas, A.V.** Structuring institution-wide participation in URGE and institutional follow-through, 2021. AGU Fall Meeting.

**Subhas, A.V.**, Berelson, W.M., Ziveri, P., Dong, S., Rae, J.W.B., Gray, W.R., Byrne, R., Adkins, J.F. Shallow calcium carbonate cycling in the ocean driven by organic matter respiration, 2021. Goldschmidt (virtual).

Hill, D. \*, **Subhas, A.V.** Analysis of pCO<sub>2</sub> and calcium carbonate saturation state distributions in the global oceans, 2020. AGU Fall Meeting (virtual).

Jackson, A. \*, **Subhas, A.V.** Calcium carbonate fluxes in the Atlantic Ocean through sediment trap particulate inorganic and organic carbon data, 2020. AGU Fall Meeting.

Muniz, K. \*, **Subhas, A.V.** Investigating carbon fluxes through sediment traps in the Pacific Ocean, 2020. AGU Fall Meeting.

Berelson, W.M., Adkins, J.F., **Subhas, A.V.**, Dong, S., Naviaux, J., Ziveri, P., Rae, J.W.B. Carbonate chemistry through a transect of the North Pacific: Particle fluxes and dissolution patterns, 2020. Ocean Sciences Meeting.

Dong, S., Berelson, W.M., **Subhas, A.V.**, Rollins, N.E., Teng, H., Pirbadian, S., El-Naggar, M., Adkins, J.F. Carbonic anhydrase enhanced calcite dissolution: Atomic scale mechanisms and measurements in the North Pacific, 2020. Ocean Sciences Meeting.

**Subhas, A.V.**, McCorkle, D.C., Long, M.H., Quizon, A., McNichol, A.P. Selective preservation of coccolith calcite in Ontong-Java Plateau sediments, 2019. Goldschmidt.

Dong, S., Celestian, A., Turaga, N., Rollins, N., Naviaux, J., **Subhas, A.V.**, Adkins, J.F., Berelson, W.M. A new study on PIC dissolution and sinking fluxes, concentrations, and calcite/aragonite ratios in the North Pacific, 2018. Goldschmidt.

**Subhas, A.V.**, Dong, S., Naviaux, J., Rollins, N., Adkins, J.F., Ziveri, P., Berelson, W.M. Evidence for shallow respiration-driven dissolution in the North Pacific Ocean, 2018. Ocean Carbon Biogeochemistry Meeting.

**Subhas, A.V.**, Dong, S., Kemnitz, N.J., Adkins, J.F., Berelson, W.M. The activity of carbonic anhydrase on sinking and suspended particles in the North Pacific, 2018. Ocean Sciences Meeting.

Naviaux, J., **Subhas, A.V.**, Adkins, J.F., Rollins, N., Dong, S., Berelson, W.M. The temperature dependence of calcite dissolution and a comparison with in-situ dissolution rate measurements across the N. Pacific, 2018. Ocean Sciences Meeting.

Dong, S., Rollins, N. **Subhas, A.V.**, Naviaux, J., Celestian, A.J., Kemnitz, N.J., Adkins, J.F., Berelson, W.M. In situ aragonite dissolution in North Pacific: Rate and role in modern ocean carbon budget, 2018. Ocean Sciences Meeting.

Berelson, W.M., Adkins, J.F., **Subhas, A.V.**, Dong, S., Rollins, N., Liu, S., Moore, C., Martell-Bonet, L., Ziveri, P., Rae, J.W.B., Gray, W.R., Hou, Y., Kemnitz, N.J., Lunstrum, A., Pallacks, S., Chen, S., Dugenne, M., Stutsman, J., Steiner, Z., Antler, G. Carbonate dissolution in the North Pacific Ocean: Results of C-DISK-IV; a cruise between Hawaii and Alaska to characterize carbonate producers, export, and dissolution kinetics in an acidifying ocean, 2018. Ocean Sciences Meeting.

Berelson, W.M., **Subhas, A.V.**, Dong, S., Naviux, J., Adkins, J.F. Calcite Dissolution Kinetics, 2016. AGU Fall Meeting.

**Subhas, A.V.**, Adkins, J.F., Berelson, W.M., Rollins, N., Adkins, J.F.  $^{13}\text{C}$  tracer insights into biogenic calcite dissolution kinetics, 2016. AGU Fall Meeting.

**Subhas, A.V.**, Erez, J., Rollins, N., Adkins, J.F., Berelson, W.M., Ziveri, P., Langer, G. Dissolution kinetics of biogenic carbonates in seawater, 2016. Ocean Sciences Meeting.

Dong, S., **Subhas, A.V.**, Rollins, N., Berelson, W.M., Adkins, J.F. Kinetics of inorganic calcite dissolution in seawater under pressure, 2016. Ocean Sciences Meeting.

Adkins, J.F., **Subhas, A.V.**, Rollins, N., Berelson, W.M. Catalysis of  $\text{CO}_2$  sequestration by reaction with limestone can keep up with global anthropogenic emissions, 2015. Goldschmidt.

**Subhas, A.V.**, Adkins, J.F., Berelson, W.M., Rollins, N.E., Erez, J. Novel measurements of inorganic and biogenic calcite dissolution kinetics in seawater, 2015. Goldschmidt.

**Subhas, A.V.**, Rollins, N., Berelson, W.M., Erez, J., Adkins, J.F. The dissolution kinetics of calcium carbonate minerals, 2014. Ocean Sciences Meeting.

Paris, G., Sessions, A.L., **Subhas, A.V.**, Adkins, J.F. Triple isotope composition of sulfur from nanomoles of dissolved sulfate on the MC-ICPMS Neptune, 2013. AGU Fall Meeting.

Adkins, J.F., Carolin, S.A., Cobb, K., **Subhas, A.V.**, Rider, A., Meckler, N. U-series dating of tropical stalagmites, 2013. AGU Fall Meeting.

Carolin, S.A., Cobb, K., Adkins, J.F., **Subhas, A.V.** Stalagmite record of millennial-scale hydroclimate variability in Borneo during the last glacial period, 2011. AGU Fall Meeting.

Raven, M.R. Sessions, A.L. Adkins, J.F., **Subhas, A.V.** Compound-specific isotope analysis of volatile organosulfur compounds from Cariaco Basin, 2011. AGU Fall Meeting.

Paris, G., Adkins, J.F., Sessions, A.L., **Subhas, A.V.**, Waldbauer, J., Fischer, W.W. Triple isotope composition of sulfur from sulfate on the MC-ICPMS Neptune, 2011. AGU Fall Meeting.

Guthe, G.K., **Subhas, A.V.**, Smith, W.F., Schrier, J. Simulating self-assembly of porphyrin nanorods, 2009. APS March Meeting.

## INVITED TALKS

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- New England Fishery Management Council Presentation *December 2024*
- Ocean Encounters: Exploring an ocean climate solution: ocean alkalinity enhancement and the LOC-NESS project *August 2024*

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|------------------------------------------------------------------------|-----------------------|
| · Carbon to Sea Annual Convening Presentation on Field Research        | <i>May 2024</i>       |
| · Yale workshop on MRV for abiotic mCDR Presentation                   | <i>May 2024</i>       |
| · WHOI/CCCC/Dartmouth Blue Economy Short Course Presentation           | <i>April 2024</i>     |
| · NOAA CDR Task Force Presentation on LOC-NESS Project                 | <i>April 2024</i>     |
| · Fast Track Action Committee on mCDR presentation on field research   | <i>March 2024</i>     |
| · COP28 Panel on OAE and mCDR, Ocean Pavilion                          | <i>December 2023</i>  |
| · COP28 Panel on best practices for OAE research, Ocean Pavilion       | <i>December 2023</i>  |
| · COP28 Panel on marine carbon dioxide removal, China Pavilion         | <i>December 2023</i>  |
| · City College of New York seminar                                     | <i>November 2023</i>  |
| · Northeast Coastal Acidification Network Webinar                      | <i>August 2023</i>    |
| · Bermuda Institute of Ocean Sciences Seminar                          | <i>July 2023</i>      |
| · GEOMAR special seminar                                               | <i>June 2023</i>      |
| · Carbon To Sea Initiative Annual Convening Lecture                    | <i>May 2023</i>       |
| · Hampton University Marine Sciences Seminar                           | <i>April 2023</i>     |
| · Chemical Currencies of a Microbial Planet Seminar                    | <i>April 2023</i>     |
| · University of Notre Dame Environmental Change Institute Seminar      | <i>March 2023</i>     |
| · University of Connecticut Department of Marine Sciences Seminar      | <i>February 2023</i>  |
| · University of Maine School of Earth and Climate Sciences Seminar     | <i>September 2022</i> |
| · Ocean Frontier 2022 Conference, Halifax, Nova Scotia                 | <i>May 2022</i>       |
| · Rutgers DMCS Seminar                                                 | <i>February 2022</i>  |
| · MIT Parsons Seminar                                                  | <i>April 2021</i>     |
| · University of Portsmouth SEGG Research Seminar                       | <i>November, 2020</i> |
| · Resnick Sustainability Institute Young Investigators Symposium       | <i>November 2019</i>  |
| · Old Dominion University OEAS Department seminar                      | <i>October 2019</i>   |
| · Gordon Research Conference in Chemical Oceanography                  | <i>July 2019</i>      |
| · University of Hawaii Oceanography guest seminar                      | <i>February 2019</i>  |
| · Comer Climate Conference                                             | <i>October 2018</i>   |
| · NOSAMS Advisory Board Meeting                                        | <i>September 2018</i> |
| · Lamont-Doherty Earth Observatory guest Seminar                       | <i>May 2018</i>       |
| · University of Washington School of Oceanography guest Seminar        | <i>September 2017</i> |
| · Caltech Environmental Science and Engineering Seminar                | <i>March 2017</i>     |
| · Harvard ClimaTea Symposium                                           | <i>November 2016</i>  |
| · Picarro, Inc. Webinar Series                                         | <i>Fall 2015</i>      |
| · Princeton University Environmental Geology and Geochemistry Seminar  | <i>Fall 2015</i>      |
| · Koshland Integrated Natural Science Center Board of Trustees Meeting | <i>Winter 2009</i>    |