

Dr. Chandranath Basak

Email: cbasak@udel.edu

Web: <https://basak-clim-chem.weebly.com/>

University of Delaware

Department of Earth Sciences

255 Academy Street, Newark,

DE 19716, USA

Google Scholar: <https://scholar.google.com/citations?user=RyR0bqcAAAAJ&hl=en>

EDUCATION

- 2011 University of Florida, Gainesville, FL
Ph.D. in Geological Sciences
- 2006 Indiana State University, Terra Haute, IN
M.Sc. in Geology
- 2004 Jadavpur University, India
M.Sc. in Applied Geology
- 2002 University of Calcutta, India
B.Sc. in Geology (Honors); Minor: Chemistry and Mathematics

APPOINTMENTS

- 2019 – University of Delaware, Newark, DE
Research Assistant Professor; Department of Earth Sciences
Joint Appointment: School of Marine Science and Policy
Affiliate: Delaware Environmental Institute
- 2017 – Lamont-Doherty Earth Observatory, Columbia University, New York
Adjunct Associate Research Scientist
- 2017 – California State University, Bakersfield, CA
2019 Assistant Professor
- 2014 – Lamont-Doherty Earth Observatory, Columbia University, New York
2017 Postdoctoral Research Scientist
- 2011 – Max Planck Research Group- Marine Isotope Geochemistry at Carl
2013 von Ossietzky University, Institute for Chemistry and Biology of the
Marine Environment, Germany
Postdoctoral Research Scientist

GRANTS AND AWARDS

- 2021 National Science Foundation (Awarded)
Collaborative Research: US GEOTRACES GP17-OCE: Understanding
Nd isotopes and REE systematics in the South Pacific (**\$495,676**
NSF, Chemical Oceanography; **Basak, C., PI**)

Dr. Chandranath Basak

Email: cbasak@udel.edu

Web: <https://basak-clim-chem.weebly.com/>

University of Delaware

Department of Earth Sciences

255 Academy Street, Newark,

DE 19716, USA

Google Scholar: <https://scholar.google.com/citations?user=RyR0bqcAAAAJ&hl=en>

- 2019 National Science Foundation (Awarded)
Collaborative Research: Investigating the Influences of Hydrothermal and Respired Carbon in Intermediate Waters of the Equatorial Pacific Ocean During the Last Deglaciation (**\$255,788** NSF, MG&G; **Basak, C., UD PI**)
- National Science Foundation (Sub-contract from Columbia University)
Deep ocean Circulation and water mass structure in the high latitude South Pacific across the Plio/Pleistocene (**\$17,997**, IODP post expedition award, **Basak, C., PI**).
- 2018 W.M. Keck Foundation (Awarded)
Introducing Undergraduate Students to Ocean Science Research (**\$150,000**; **Basak, C., PI**)
- California State University, Bakersfield (Awarded)
Behavior of Rare Earth Elements (REEs) in Oxygen Minimum Zone (**4 teaching credit release** to engage in research, scholarship and creative Activity; **Basak, C., PI**)
- 2017 National Science Foundation (Awarded)
Testing fidelity of Nd isotopes as a paleocirculation tracer in the Southeast Indian-Southern Ocean (**\$142,645** NSF, MG&G; **Basak, C., PI**)
- National Science Foundation (Awarded)
Collaborative Research: US GEOTRACES Pacific Meridional Transect: Source and Sinks of Nd Isotopes and REE (**\$443,776**, NSF, Chemical Oceanography; **Basak, C., Co-PI**)
- 2015 Lamont Climate Center (Awarded)
Oxygen Minimum Zone fluctuation in the Arabian Sea during abrupt climate change events (**\$10,000**, **Basak, C., PI**)

CURRENT RESEARCH PROJECTS

- 2021 US GEOTRACES GP17-OCE: Understanding Nd isotopes and REE systematics in the South Pacific
- 2019/20 Investigating the influences of hydrothermal and respired carbon in intermediate waters of the equatorial Pacific ocean during the last deglaciation
- Deep ocean circulation and water mass structure in the high latitude South Pacific across the Plio/Pleistocene

Mapping rare earth elements in a fast changing ocean

2018 Testing fidelity of Nd isotopes as a paleocirculation tracer in the Southeast Indian-Southern Ocean

Dissolved rare earth elements along an oxygen gradient off San Diego

2017 US GEOTRACES Pacific Meridional Transect: Source and sinks of Nd isotopes and REE

2016 Understanding the subarctic North Pacific past circulation changes: Nd isotopic approach

2014 US GEOTRACES: Dissolved Nd isotope ratios along the GEOTRACES Eastern Pacific Zonal Transect

PUBLICATIONS

Peer-reviewed journal articles and expedition report [* mentored postdoc]

2021 19. Wu, Y., Pena, L.D., Goldstein, S.L., Anderson, R.F., Hartman, A.E., Bolge, L.L., **Basak, C.**, Rijkenberg, M.J.A, de Baar, H.J.W 2021. Assessing neodymium isotopes as an ocean circulation tracer in the Southwest Atlantic. *Submitted to Nature Geoscience*

18. Haley, B.A., Wu, Y., Muratli, J.M., **Basak, C.**, Goldstein, S., 2021. Rare earth element and neodymium isotopes of the eastern US GEOTRACES Equatorial Pacific Zonal Transect (GP16). *Earth and Planetary Science Letters, (in revision)*

17. Cruz, A.P.S.*, **Basak, C.**, Rafter, P., Ramos, R. C. P., Rathburn, A.E., Barbosa, C.F., 2021. Neodymium Isotope Response to Hydrologic and Water Mass Changes in the Equatorial and Subtropical Western Atlantic During the Last 40 kyr. *Earth and Planetary Science Letters, (in revision)*

Lamy, F., Winckler, G., Alvarez Zarikian, C.A., and the **Expedition 383 Scientists**, 2021. Dynamics of the Pacific Antarctic Circumpolar Current. Proceedings of the International Ocean Discovery Program, 383: College Station, TX (International Ocean Discovery Program).

2020 16. Wu, Y., Pena, L. D., Goldstein, S. L., **Basak, C.**, Bolge, L. L., Jones, K.M., McDaniel, D.K., Hemming, S.R., 2020. A User-Friendly Workbook to Facilitate Rapid and Accurate Rare Earth Element

- Analyses by ICP-MS for Multi-spiked Samples. *Geochemistry, Geophysics, Geosystems*, 21, 2020GC009042.
- 2019 15. Naik, S.S., **Basak, C.**, Goldstein, S.L., Naidu, P.D., Naik, S.N., 2019. A 16 kyr record of ocean circulation and monsoon intensification from the central Bay of Bengal. *Geochemistry, Geophysics, Geosystems* 20, 872-882.
14. Sarkar, S., **Basak, C.**, Frank, M., Berndt, C., Huuse, M., Badhani, S., Bialas, J., 2019. Late Eocene onset of the Proto-Antarctic Circumpolar Current. *Scientific Reports* 9, 10125.
- 2018 13. **Basak, C.**, Fröllje, H., Lamy, F., Gersonde, R., Benz, V., Anderson, R.F., Molina-Kescher, M., Pahnke, K., 2018. Breakup of last glacial deep stratification in the South Pacific. *Science* 359, 900-
12. R. Schlitzer **et al.**, 2018. The GEOTRACES Intermediate Data Product 2017. *Chemical Geology*, <https://doi.org/10.1016/j.chemgeo.2018.05.040>
- 2015 11. Horikawa K., Martin E. E., **Basak C.**, Onodera J., Osamu Seki, Sakamoto T., Ikehara M., Sakai S., Kawamura K., 2015. Pliocene climate cooling enhanced by flow of low salinity Bering Sea water to the Arctic Ocean. *Nature Communications*, 6.
10. **Basak, C.**, Pahnke, K., Frank, M., Lamy, F., Gersonde, R., 2015. Neodymium isotopic characterization of Ross Sea Bottom Water and its advection through the southern South Pacific. *Earth and Planetary Science Letters* 419, 211-221.
- 2013 9. **Basak, C.**, and Martin, E. E., 2013. Antarctic weathering and carbonate compensation at the Eocene-Oligocene transition. *Nature Geoscience*, 6(2): 121-124.
- 2012 8. van de Flierdt T., Pahnke K., and **GEOTRACES intercalibration participants**, 2012. GEOTRACES intercalibration of neodymium isotopes and rare earth elements in seawater and marine particulates – Part 1: international intercomparison. *Limnology and Oceanography: Methods*, 10, 234-251.
- 2011 7. MacLeod, K.G., Isaza Londono, C., Martin, E.E., Jimenez Berrocoso, A., and **Basak, C.**, 2011. Changes in North Atlantic circulation at the end of the Cretaceous greenhouse interval. *Nature Geoscience*, 4(11), 779-782.
6. **Basak C.**, Martin E. E., and Kamenov, G. D., 2011. Seawater Pb isotopes extracted from Cenozoic marine sediments. *Chemical Geology*, 286, 94-108.
- 2010 5. **Basak, C.**, Martin, E.E., Horikawa, K., and Marchitto, T.M., 2010. Southern Ocean source of 14C- depleted carbon in the North Pacific

Ocean during the last deglaciation. *Nature Geoscience*, 3(11): 770-773.

4. Jiménez Berrocoso, A., MacLeod K.G., Martin, E.E., Bourbon, E., Isaza-Londoño, and **Basak, C.**, 2010. Nutrient trapping during Late Cretaceous organic-rich shale deposition in the tropical North Atlantic. *Geology* 38, 1111-1114.

3. Martin, E.E., Blair, S.W., Kamenov, G.D., Scher, H.D., Bourbon, E., **Basak, C.** and Newkirk, D.N., 2010. Extraction of Nd isotopes from bulk deep-sea sediments for paleoceanographic studies on Cenozoic time scales. *Chemical Geology*, 269(3-4): 414-431.

2. Dekov V. M., Cuadros J., Kamenov G. D., Weiss D., Arnold T., **Basak C.**, and Rochette P., 2010. Metalliferous sediments from the H.M.S. Challenger voyage (1872-1876). *Geochimica et Cosmochimica Acta* 74(17), 5019-5038.

2009

1. **Basak, C.**, Rathburn, A.E., Pérez, M.E., Martin, J.B., Kluesner, J.W., Levin, L.A., De Deckker, P., Gieskes, J.M. and Abriani, M., 2009. Carbon and oxygen isotope geochemistry of live (stained) benthic foraminifera from the Aleutian Margin and the Southern Australian Margin. *Marine Micropaleontology*, 70(3-4): 89-101.

Manuscripts in preparation

2. **Basak, C.**, Wu, Y., Goldstein, S. L., Haley, B. A., Muratli, J. M., Pena, L. D., Bolge, L., Fitzsimmons, J.N., Sherrell, R.M., Hydrothermal REE contribution along the GEOTRACES Eastern Pacific Zonal Transect (to be submitted to *Earth and Planetary Science Letters*).

1. Fröllje, H., **Basak, C.**, Ullermann, J., Lamy, F., Gersonde, R., Pahnke, K., Variable glacial- interglacial Southern Ocean deep-water mixing over the last 140 ka traced by neodymium isotopes. (to be submitted to *Paleoceanography and Paleoclimatology*).

PUBLISHED ABSTRACTS AND PRESENTATIONS (LAST 5 YEARS)

(*posdoctoral scholar)

2021 13. **Basak, C.**, Wu, Y., Haley, B.H., Muratli, J., Pena, L.D., Bolge, L., Fitzsimmons, J.N., Sherrell, R.M., Goldstein, S.L., 2021. Role of suspended particulate matter and dissolved Nd in the hydrothermal plume from the East Pacific Rise, Goldschmidt Conference (virtual), France (*invited speaker*).

- 2019
12. Cruz, A. P. S.*, **Basak, C.**, Portilho-Ramos, R., Rathburn, A.E., Barbosa, C.F., 2019. Reconstruction of Antarctic Intermediate Water Geometry in the Mid-latitude South Atlantic During the Last 40 kyr, Fall meeting of American Geophysical Union, San Francisco, USA.
11. Goldstein, S. L., Pena, L. D., Yehudai, M., Kim, K., Segui, M. J., Knudson, K. P., **Basak, C.**, Hartman, A.E., Lupien, R., 2019. AMOC Variability over the Last ~2 Ma from a North-South Atlantic Transect Using Nd Isotopes, Fall meeting of American Geophysical Union, San Francisco, USA.
10. **Basak, C.**, Wu, Y., Muratli, J. M., Goldstein, S. L., Haley, B. A., Pena, L. D., 2019. Dissolved Nd isotope ratios along the GEOTRACES Eastern Pacific Zonal Transect, Japan Oceanographic Society, Toyama, Japan.
- 2018
9. Vivancos, S. M., Anderson, R.F., Pavia, F.J., Fleisher, M.Q., Lu, Y., Zhang, P., Cheng, Y., Edwards, R.L., Muratli, J.M., Haley, B.A., **Basak, C.**, Goldstein, S.L., 2018. Oceanic Dissolved Residence Times of Bioactive and Rare Earth Elements in the Eastern Tropical Pacific Ocean Along the GEOTRACES GP16 Transect. Ocean Sciences Meeting, Portland, USA.
- 2017
8. Kim, K., Segui, M. J., Knudson, K. P., Yehudai, M., Goldstein, S. L., Pena, L. D., **Basak, C.**, Ferretti, P., 2017. Reconstruction of the North Atlantic end-member of the Atlantic Meridional Overturning Circulation over glacial–interglacial cycles, Fall meeting of American Geophysical Union, New Orleans, USA.
7. Goldstein, S. L., Pena, L. D., Yehudai, M., Segui, M. J., Kim, J., Knudson, K. P., **Basak, C.**, 2017. The Atlantic Meridional Overturning Circulation over time: a Nd isotope perspective, Fall meeting of American Geophysical Union, New Orleans, USA.
- 2016
6. **Basak, C.**, Muratli, J., Wu, Y., Haley, B., Goldstein, S. L., 2016. Dissolved Nd isotope ratios along the US GEOTRACES Eastern Pacific Zonal Transect. Fall meeting of American Geophysical Union, San Francisco, USA.
5. Plancherel, Y., **Basak, C.****, Khatiwala, S., Anderson, R. F., 2016. The influence of ne pheloid layers on global model simulations of ²³¹Pa and ²³⁰Th. Fall meeting of American Geophysical Union, San Francisco, USA. [******presenting author].
4. Naik, S. S., **Basak, C.**, Naidu, D., Goldstein, S. L., 2016. A 16 kyr

Dr. Chandranath Basak

Email: cbasak@udel.edu

Web: <https://basak-clim-chem.weebly.com/>

University of Delaware

Department of Earth Sciences

255 Academy Street, Newark,

DE 19716, USA

Google Scholar: <https://scholar.google.com/citations?user=RyR0bqcAAAAJ&hl=en>

seawater neodymium isotope record from the central Bay of Bengal.
Fall meeting of American Geophysical Union, San Francisco, USA.

3. **Basak, C.**, Goldstein, S. L., Anderson, R. F., Romahan, S. Pätzold, J., 2016. Ocean Circulation and Past Variability in Arabian Sea Oxygen Minimum Zone. International Conference of Paleoceanography 12, Utrecht, Netherlands.

2. Pahnke, K., **Basak, C.**, Fröllje, H., Lamy, F., Gersonde, R., Anderson, R.F., 2016. Breakup of last glacial deep stratification in the south pacific. International Conference of Paleoceanography 12, Utrecht, Netherlands.

2015 1. Fröllje, H., **Basak, C.**, Lamy, F., Gersonde, R., Ullermann, J., and Pahnke, K., 2015. Changes in the South Pacific deep water Nd isotope composition over the last 140 ka. European Geophysical Union General Assembly 2015, Vienna, Austria.

OTHER AWARDS AND HONORS

- 2011 John Ridge Award: Outstanding Graduate Student in academic excellence, Dept. of Geological Sciences, University of Florida (\$200)
- McLaughlin Dissertation Fellowship, University of Florida (\$5000)
- 2010 Travel grant, International Conference of Paleoceanography 10 (\$1000)
- Travel grant from Office of Vice President of Research, University of Florida (\$300)
- Goldschmidt 2010 Travel Grant (\$1000)
- Research grant from Dept. of Geological Sciences, University of Florida (\$1000)
- 2006 Grinter Fellowship, University of Florida, Gainesville, Florida (\$3000)
- 2005 Student Travel Grant, American Geophysical Union (\$500)

INVITED TALKS

Dr. Chandranath Basak

Email: cbasak@udel.edu

Web: <https://basak-clim-chem.weebly.com/>

University of Delaware

Department of Earth Sciences

255 Academy Street, Newark,

DE 19716, USA

Google Scholar: <https://scholar.google.com/citations?user=RyR0bqcAAAAJ&hl=en>

- 2021 Goldschmidt Conference, France
- 2020 Rutgers University, New Brunswick, NJ, USA
Temple University, Philadelphia, PA, USA.
- 2019 Texas A&M University, College Station, TX, USA.
Japan Oceanographic Society Annual Meeting, Toyama, Japan.
- 2018 University of Delaware, Newark, DE, USA.
- 2017 California State University, Bakersfield, CA, USA.
- 2015 Arizona State University, Tempe, AZ, USA.
Lamont Doherty Earth Observatory, Palisades, NY, USA.
City College of New York, NY, USA.
- 2011 University of Oldenburg, Oldenburg, Germany.

RESEARCH EXPEDITIONS

- 2019 International Ocean Discovery Program, Expedition 383 (9 weeks).
Sailed as an inorganic Geochemist.
- 2018 Southern Indian Ocean (7 weeks). Funded PI.
Student training cruise onboard R/V Robert Gordon Sproul off San-Diego (1 Day) . Sailed as a mentor.
Research cruise off San-Diego (4 days). Sailed as a research scientist with active mentoring role for both undergraduate and graduate students.
- 2011 Selected participant in the UNOLS Early Career Investigator Oceanographic Research Cruise Training Program (1 week).
Involved in water sampling, sediment coring, and plankton tows.
- 2007 Invited participant on a research cruise onboard R/V Atlantis off Monterey Bay, CA (1 week). Involved in water sample collection and preservation for stable isotope analyses.

Dr. Chandranath Basak

Email: cbasak@udel.edu

Web: <https://basak-clim-chem.weebly.com/>

University of Delaware

Department of Earth Sciences

255 Academy Street, Newark,

DE 19716, USA

Google Scholar: <https://scholar.google.com/citations?user=RyR0bqcAAAAJ&hl=en>

2005 Invited participant on a research cruise onboard R/V Roger Revelle (6 days). Involvement in dredging submarine rock samples and mapping of the sea floor off the coast of California.

WORKSHOPS AND PROFESSIONAL TRAINING

2020 GP17- Tahiti-Antarctica-Chile section planning workshop, (virtual). **Role:** Basak is the lead for measuring dissolved Nd isotopes and REE measurement efforts for Tahiti-Punta-Arenas section.

2019 Wally Broecker Symposium, Palisades, NY, USA.

2018 GP15-PMT Pre-cruise meeting and workshop, Norfolk, VA, USA. **Role:** Planning Workshop for NSF funded project, Basak is a funded PI who contributed to the overall planning.

CSU Water Resources and Policy Initiatives Conference, CSUSB Palm Desert Campus, Palm Desert, CA, USA.

The Scientific Inspirations of Wolfgang H. Berger: An honorary symposium at the Scripps Institution of Oceanography, La Jolla, San Diego, CA, USA.

2017 Indian Ocean Science Workshop, La Jolla, CA, USA.

2016 US GEOTRACES Alaska-Tahiti Planning Workshop, La Jolla, CA, USA.

Biogeochemical cycling of trace elements within the ocean: A synthesis workshop, Lamont-Doherty Earth Observatory, Palisades, NY, USA.

TEACHING

2021 University of Delaware,
Geological Hazards and Their Human Impact (Undergraduate lecture)
University of Delaware, Introduction to Biogeochemistry (Upper level undergraduate and graduate level class)

2020 University of Delaware,
Geological Hazards and Their Human Impact (Undergraduate lecture)

Dr. Chandranath Basak

Email: cbasak@udel.edu

Web: <https://basak-clim-chem.weebly.com/>

University of Delaware

Department of Earth Sciences

255 Academy Street, Newark,

DE 19716, USA

Google Scholar: <https://scholar.google.com/citations?user=RyR0bqcAAAAJ&hl=en>

- 2019 California State University, Bakersfield
Geological Oceanography (Undergraduate lecture + lab course)

Paleoclimate (Graduate lecture + lab course)
- 2018 California State University, Bakersfield
Advanced Professional Development (Lecture + one-on-one session with students to improve CVs, resume, research statement)

Geological Oceanography (Undergraduate lecture + lab course)

Research Methods and Strategies (Graduate lecture)
- 2017 California State University, Bakersfield
Dangerous Earth (Undergraduate lecture + lab course)

Ocean Sciences (Graduate lecture + lab course)

GUEST LECTURES

- 2020 Ocean and Climate, Earth 100, Introductory general education class for non-majors, Penn State Brandywine

Ocean research and opportunities, GEOL 601, Overview of the graduate program in Earth Sciences, University of Delaware.

POSTDOCTORAL MENTEE

- 2018 Anna Cruz, University of Delaware
-2020

GRADUATE ADVISEE

- 2021 Laura Johnson, University of Delaware, Newark, DE
(M.S. started Fall 2021)
- 2020 Isuri Kapuge, University of Delaware, Newark, DE.
(Ph.D. started Spring 2021, delayed due to COVID-19)
- Emily Symes, University of Delaware, Newark, DE
(M.S. started Spring 2021)

Dr. Chandranath Basak

Email: cbasak@udel.edu

Web: <https://basak-clim-chem.weebly.com/>

University of Delaware

Department of Earth Sciences

255 Academy Street, Newark,

DE 19716, USA

Google Scholar: <https://scholar.google.com/citations?user=RyR0bqcAAAAJ&hl=en>

2018-20 Jesus Robles, California State University, Bakersfield, CA. (Graduated with MS in summer 2020).

INFORMAL MENTEE

2017-19 Salvador Vargas, (MS student), California State University, Bakersfield, CA

2015-17 Joohee Kim (undergraduate), Lamont Doherty Earth Observatory, Palisades, NY

2011-13 Melanie Behrens (PhD student), University of Oldenburg, Oldenburg, Germany

Henning Fröllje (PhD student), University of Oldenburg, Oldenburg, Germany

UNDERGRADUATE MENTEE

2021 Alex Shepro (University of Delaware, Summer Research Scholar)

2020 Daniel Vernon (University of Delaware)

2019 Alana Hodge (University of Delaware)

SERVICE

2021 US member of the Scientific Evaluation Panel, International Ocean Discovery Program (IODP)

Ad hoc reviewer, NSF

Senate Library Committee at the University of Delaware

Organizer of Department of Earth Sciences Fall Seminar series, University of Delaware

2020 US member of the Scientific Evaluation Panel, International Ocean Discovery Program (IODP)

Panelist, Marine Geology and Geophysics Program
National Science Foundation (NSF)

Panelist, Graduate Research Fellowship Program

Dr. Chandranath Basak

Email: cbasak@udel.edu

Web: <https://basak-clim-chem.weebly.com/>

University of Delaware

Department of Earth Sciences

255 Academy Street, Newark,

DE 19716, USA

Google Scholar: <https://scholar.google.com/citations?user=RyR0bqcAAAAJ&hl=en>

National Science Foundation (NSF)

Ad hoc reviewer, NSF

Session organizer, American Geophysical Union, Fall meeting.

Committee member, 'Respectful Conversations, Code of Conduct'
Department of Earth Sciences, University of Delaware.

Senate Library Committee at the University of Delaware

2019 Committee member, Environmental Health and Safety Committee,
California State University, Bakersfield

Ad hoc reviewer, NERC-IODP

2018 Panelist, Graduate Research Fellowship Program
National Science Foundation (NSF)

2017 Ad hoc reviewer, NSF

Volunteer judge, Outstanding Student Presentation Competition,
American Geophysical Union (AGU) fall meeting

2017, 2016 Mentor, Columbia's Lamont-Doherty Earth Observatory High School
Student Intern Mentoring Program

2012 Ad hoc reviewer, United States-Israel Binational Science Foundation

2011 – Manuscript reviewer: *Geology, Earth and Planetary Science Letters,*
Geochimica Cosmochimica Acta, Marine Geology, Chemical Geology, G3:
Geochemistry, Geophysics, Geosystems, Nature, Nature Geoscience,
Nature Communications, Geophysical Research Letters,
Paleoceanography and Paleoclimatology, Quaternary Science Reviews.

PROFESSIONAL MEMBERSHIP

2010 – Geochemical Society

2005 – American Geophysical Union