Jianghui Du

Contact Information

ETH Zürich, Institute of Geochemistry and Petrology
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Education

Oregon State University, USA
Ph.D., Oceanography, June 2019 (Advisors: Alan C. Mix and Brian A. Haley)

Peking University, China
M.S., Geology, July 2011 (Advisor: Baoqi Huang）
B.S., Geology, July 2009

Research Interests

Ocean and Earth Sciences

- Ocean biogeochemical cycles
- Marine trace elements and isotopes
- Paleoceanography and paleoclimate
- Ocean biogeochemical modeling

Research Experience

ETH Zürich, Switzerland
ETH Postdoc Fellow & Marie Skłodowska-Curie Fellow (Host: Derek Vance) **November 2019 - present**

- Investigating trace element and isotope cycling across the sediment-water interface and the influence on global ocean biogeochemistry using pore water analysis, sediment biogeochemical modeling and ocean biogeochemical modeling

Oregon State University, USA
Graduate Research Assistant & Research Associate **August 2014 - October 2019**

- Study the influence of sedimentary sources on the distributions of Neodymium isotopes and Rare Earth Elements in the ocean
- Reconstruct global ocean circulation using Neodymium isotopes since the Last Glacial Maximum
- Using trace metals to study the deoxygenation events in the North Pacific in the last 50,000 years

Peking University, China
Graduate Research Assistant **September 2009 - June 2011**

- Reconstruct global ocean circulation using stable oxygen and carbon isotopes during the onset of Northern Hemisphere Glaciation

Peking University, China
Undergraduate Research Assistant **September 2007 - June 2009**

- Study the East Asian Monsoon in MIS3 using sediment records from the South China Sea

Mentoring Experience

ETH Zurich, Switzerland
Sarah Fleischmann, Ph.D. student, Second advisor (Primary advisor: Derek Vance) **2022 - present**

- Thesis title: Quantifiying and understanding the benthic flux of the ocean of trace elements and their isotopes

Manyu Chen, M.S. student, Second advisor (Primary advisor: Greg de Souza) **2023 - present**

- Thesis title: Insights of silicon benthic flux by studying silicon stable isotope in porewater from the abyssal sediments in the Equatorial Pacific Ocean

Teaching Experience

Oregon State University, USA
Graduate Teaching Assistant **Winter 2017, Fall 2018**

- Biogeochemical Earth, graduate level course for ocean science students

Peking University, China
Graduate Teaching Assistant **Fall 2011**

- Paleobiology, undergraduate level course for geology students

Publications **In Review/Revision**

19. **Du J.** (**2023**) SedTrace 1.0: a Julia-based framework for generating and running reactive-transport models of marine sediment diagenesis specializing in trace elements and isotopes, ***Geoscientific Model Development Discussion***. [preprint], https://doi.org/10.5194/gmd-2022-281, in review.

Peer reviewed

18. *Fleischmann S., **Du J.**, Chatterjee A., McManus J., Lyer S. D., Amonkar A., Vance D. (**2023**) The nickel output to abyssal pelagic manganese oxides: a balanced elemental and isotope budget for the oceans, ***Earth and Planetary Science Letters*** 619, 118301. ***Supervised student**

17. Deng K., Rickli J., Suhrhoff T. J., **Du J.**, Scholz F., Severmann S., Yang S., McManus J., Vance D. (**2023**) Dominance of Benthic fluxes in the Oceanic Beryllium Budget and Implications for Paleo-denudation Records, ***Science Advances*** 9, adg3702.

16. **Du J.**, Mix A. C., Haley B. A., Belanger C. L., Sharon. (**2022**) Volcanic trigger of ocean deoxygenation during Cordilleran ice sheet retreat. ***Nature***, 611, 74–80. **Accompanied by News & Views**

15. **Du J.**, Haley B. A., Mix A. C., Abbott A. N., McManus J., Vance D. (**2022**) Reactive-transport modeling of neodymium and its radiogenic isotope in deep-sea sediments: the roles of authigenesis, marine silicate weathering and reverse weathering. ***Earth and Planetary Science Letters*** 596, 117792.

14. Deng K., Yang S., **Du J.**, Lian E., Vance D. (**2022**) Dominance of benthic flux of REE on continental shelves: implications for oceanic budgets. ***Geochemical Perspective Letters*** 22, 26–30.

13. Lemaitre N., **Du J.**, de Souza F. G., Archer C., Vance D. (**2022**) The essential bioactive role of nickel in the oceans: evidence from nickel isotopes. ***Earth and Planetary Science Letters*** 587, 117513.

12. Abbott A. N., Löhr S. C., Payne A., Kumar H. and **Du J.** (**2022**) Widespread lithogenic control of marine authigenic neodymium isotope records? Implications for paleoceanographic reconstructions. ***Geochimica et Cosmochimica Acta*** 319, 318–336.

11. Sharon, Belanger C. L., **Du J.** and Mix A. C. (**2021**) Reconstructing Paleo-oxygenation for the Last 54,000 Years in the Gulf of Alaska Using Cross-validated Benthic Foraminiferal and Geochemical Records. ***Paleoceanography and Paleoclimatology*** 36, e2020PA003986.

10. **Du J.**, Haley B. A. and Mix A. C. (**2020**) Evolution of the Global Overturning Circulation since the Last Glacial Maximum based on marine authigenic neodymium isotopes. ***Quaternary Science Reviews*** 241, 106396. **Invited paper**

9. Walczak M. H., Mix A. C., Cowan E. A., Fallon S., Fifield L. K., Alder J. R., **Du J.**, Haley B., Hobern T., Padman J., Praetorius S. K., Schmittner A., Stoner J. S. and Zellers S. D. (**2020**) Phasing of millennial-scale climate variability in the Pacific and Atlantic Oceans. ***Science*** 370, 716–720.

8. Praetorius S. K., Condron A., Mix A. C., Walczak M. H., McKay J. L. and **Du J.** (**2020**) The role of Northeast Pacific meltwater events in deglacial climate change. ***Science Advances 6***, 6, eaay2915.

7. Belanger C. L., Sharon, **Du J.**, Payne C. R. and Mix A. C. (**2020**) North Pacific deep-sea ecosystem responses reflect post-glacial switch to pulsed export productivity, deoxygenation, and destratification. ***Deep Sea Research Part I: Oceanographic Research Papers*** 164, 103341.

6. Khider D., et al. (**2019**) PaCTS v1.0: A Crowdsourced Reporting Standard for Paleoclimate Data. ***Paleoceanography and Paleoclimatology*** 34, 1570-1596.

5. **Du J.**, Haley B. A., Mix A. C., Walczak M. H. and Praetorius S. K. (**2018**) Flushing of the deep Pacific Ocean and the deglacial rise of atmospheric CO_2 concentrations. ***Nature Geoscience*** 11, 749–755.

4. Haley B. A., **Du J.**, Abbott A. N. and McManus J. (**2017**) The Impact of Benthic Processes on Rare Earth Element and Neodymium Isotope Distributions in the Oceans. ***Frontiers in Marine Science*** 4, 426.

3. **Du J.**, Haley B. A. and Mix A. C. (**2016**) Neodymium isotopes in authigenic phases, bottom waters and detrital sediments in the Gulf of Alaska and their implications for paleo-circulation reconstruction. ***Geochimica et Cosmochimica Acta*** 193, 14–35.

2. **Du J.**, Huang B. and Zhou L. (**2016**) Global deepwater circulation between 2.4 and 1.7 Ma and its connection to the onset of Northern Hemisphere Glaciation. ***Paleoceanography*** 31, 1480–1497.

1. **Du J.** and Huang B. (**2010**) Variations in upper water structure during MIS3 from the western South China Sea. ***Chinese Science Bulletin*** 55, 301–307.

Grants & Fellowships

Marie Skłodowska-Curie Individual Fellowship, European Union

- 191,149 Euro, 2021-2023.

ETH Postdoctoral Fellowship, ETH Zurich

- 230,800 Swiss Franc, 2020-2021.

Honors & Awards

Kirk Bryan Award, Geological Society of America, 2021

- *Co-author of Walczak et al., (2020) Phasing of millennial-scale climate variability in the Pacific and Atlantic Oceans. Science 370, 716–720.*

Harry Elderfield Student Paper Award, American Geophysical Union, 2019

- *For "exemplary manuscript from a PhD graduate student and excemptional promise for continued contributions in the fields of Paleoceanogrpahy and/or Paleoclimatology."*

GSC Travel Reimbursement Award, Oregon State University, 2018

Zhangyun Scholarship, Peking University, 2010-2011

Academic Scholarship for Graduate students, Peking University, First Prize, 2009-2011

National Inspirational Scholarship, 2008-2009

Mao Yu Gang Grant for undergraduate research, Peking University, 2007-2009

Honor for Academic Excellence, Peking University, 2006-2008

Geology Fellowship, First honor, Peking University, 2005-2009

Invited Talks

International Conferences

EGU General Assembly, Vienna, Austria, 2023.

- Invited by session “Response of ocean biogeochemical cycles to past, present and future climate change".

AGU Fall Meeting, Chicago, USA, 2022.

- Invited by session “Ocean deoxygenation during past hyperthermals".

Goldschmidt, Lyon, France, 2021.

- Invited by session “Benthic dynamics in a changing ocean".

AGU Fall Meeting, San Francisco, USA, 2019.

- Invited by session “Deep ocean circulation changes and their impacts".

Seminars

"Shuang Gu" Forum, Department of Ocean Science and Engineering, Southern University of Science and Technology, 2023

Department seminar, School of Earth and Space Sciences & Institute of Ocean Research, Peking University, 2022

OEB Distinguished Doctoral Scholar Seminar Series, Oregon State University, 2021

Symposium of seawater trace elements and isotopes, Peking University, 2016

Professional Activities

Reviewer (academic journals)

- Geochimica et Cosmochimica
- Geophysical Research Letters
- Chemical Geology
- Quaternary Science Review
- Biogeosciences
- Geoscientific Model Development
- Paleoceanography and Paleoclimatology
- Frontiers in Marine Science
- Geochemistry, Geophysics, Geosystems

Reviewer (funding agencies)

- National Science Foundation, USA,
- Natural Environment Research Council, UK

Conference

- Co-convener, Goldschmidt 2022, Session 14b “Transport and transformations of trace metals from estuaries to open ocean”, Hawaii, USA.

- Co-convener, Goldschmidt 2019, Session 10a "Silicate alteration in ocean sediments and synthetic glasses: process, consequence, and kinetics", Barcelona, Spain.

Professional Affiliations

- American Geophysical Union
- Geochemical Society
- European Association of Geochemistry
- The Oceanography Society

Field Experience

R/V Oceanus, Astoria Canyon coring expedition **Summer 2017**

- Retrieving sediment cores from the Astoria fan to reconstruct the history of Missoula flood during the last deglaciation

R/V Elakha, Newport Hydrographic Line **Spring 2015**

- Survey of hydrography, chlorophyll, and zooplankton populations in an Oregon nearshore and estuarine system during upwelling conditions.

Conference Abstracts (presenting author only)

15. **Du J.**, Vance D. Modelling the sedimentary source and diagenetic fractionation of Rare Earth Elements in the ocean , **EGU General Assembly 2023**, Vienna, Austria **[Invited Oral]**.
14. **Du J.**, Mix A. C., Haley B. A., Belanger L. C., Sharon. Volcanic Trigger of Northeast Pacific Deoxygenation during Cordilleran Ice Sheet Retreat, **AGU Fall Meeting 2022**, Chicago, USA **[Invited Poster]**
13. **Du J.**, Haley B. A., Mix A. C., Vance D. Reactive-transport modeling of the early diagenesis of Neodymium and its radiogenic isotope in deep-sea sediments: the roles of authigenesis, silicate weathering and reverse weathering, **Goldschmidt 2022**, Hawaii, USA **[Oral]**.
12. **Du J.**, Haley B. A., Mix A. C., Vance D. Studying the cycling of trace elements and isotopes at the sediment-water interface using a diagenetic model with automated code generation for user defined problems, **Goldschmidt 2021**, Lyon, France **[Invited Oral]**.
11. **Du J.**, Haley B. A. and Mix A. C., Evolution of the Global Overturning Circulation since the Last Glacial Maximum based on neodymium isotopes, **AGU fall meeting 2019**, San Francisco, USA **[Invited Oral]**.
10. **Du J.**, Haley B. A. and Mix A. C., Revisiting seawater Rare Earth Element patterns with an emphasis on the lithogenic sources, **Goldschmidt 2019**, Barcelona, Spain.
9. **Du J.**, Haley B. A. and Mix A. C., The influence of the source function on seawater Rare Earth Element patterns, **AGU fall meeting 2018**, Washington D.C., USA.
8. **Du J.**, Haley B. A. and Mix A. C., In situ marine silicate weathering as a source of Fe to the oxic ocean, **Goldschmidt 2018**, Boston, USA.
7. **Du J.**, Haley B. A., Mix A. C., Walczak M. H. and Praetorius S. K., Flushing of the deep Pacific drove deglacial rise of atmospheric CO_2, **Ocean Sciences Meeting 2018**, Portland, USA **[Oral]**.
6. **Du J.**, The ocean biogeochemistry of neodymium and its isotopes, **Symposium of seawater trace elements and isotopes 2016**, Peking University, Beijing, China **[Invited Oral]**.
5. **Du J.**, Haley B. A. and Mix A. C., The relationship of ε_{Nd} among authigenic phase, detrital sediment and bottom water, **Goldschmidt 2016**, Yokohama, Japan.
4. **Du J.**, Haley B. A. and Mix A. C., Covariation of deglacial North Pacific intermediate water ventilation and atmospheric CO_2 evidenced by authigenic neodymium isotope composition, **AGU fall meeting 2016**, San Francisco, USA **[Oral]**.
3. **Du J.**, Haley B. A., Mix A. C., Extracting authigenic ε_{Nd} signals from Gulf of Alaska sediments, **AGU fall meeting 2015**, San Francisco, USA.
2. **Du J.**, Huang B., Pacific deep water circulation in the early Pleistocene, **The 3rd Conference on Earth System Science 2014**, Shanghai, China.
1. **Du J.**, Huang, B., Niu, Y. and Chen, M., Reconstructing upper water structure of western South China Sea in MIS3 using planktonic foraminifera Mg/Ca, **AGU fall meeting 2010**, San Francisco, USA.