C. Spencer Jones (he/him) **spencerjones@tamu.edu**

Contact Information

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Education

Scripps Institution of Oceanography, University of California, San Diego
PhD in Physical Oceanography.
Dissertation title:
The global meridional overturning circulation in an idealized two-basin model
Advisor: Professor Paola Cessi
2011–2018

Oxford University
MPhys, Second Class Upper Division
2007–2011

Research Experience

Texas A&M University
ACES fellow & Visiting Assistant Professor
August 2021–present

Lamont Doherty Earth Observatory
Associate Research Scientist
September 2020–July 2021
Postdoctoral Research Fellow
June 2018–September 2020

Scripps Institution of Oceanography
Graduate Research Assistant
July 2012 - May 2018

Journal Articles

C. S. Jones, Q. Xiao, R. P. Abernathey and K. S. Smith. Using Lagrangian filtering to remove waves from the ocean surface velocity field (2023). *Journal of Advances in Modeling Earth Systems* doi: 10.1029/2022MS003220

S. T. Bailey, **C. S. Jones**, R. P. Abernathey, A.L. Gordon and X. Yuan. Water mass transformation variability in the Weddell Sea in ocean reanalyses (2023). *Ocean Science* doi: 10.5194/os-19-381-2023

F. J. Pavia, **C. S. Jones** and S.K. Hines. Geometry of the Meridional Overturning Circulation at the Last Glacial Maximum (2022). *J.Clim.* doi: 10.1175/JCLI-D-21-0671.1 (all authors contributed equally to this manuscript)

C. S. Jones and R. P. Abernathey. Modeling tracer distributions in the modern and LGM ocean: circulation change vs. isopycnal mixing (2021). *J.Phys. Oceanogr.* doi: 10.1175/JPO-D-20-0204.1

C. S. Jones and R. P. Abernathey. Isopycnal mixing controls deep ocean ventilation (2019). *Geophysical Research Letters*, 46 doi: 10.1029/2019GL085208

C. S. Jones and P. Cessi. Components of salt transport in the upper branch of the meridional overturning circulation (2018). *J.Phys. Oceanogr.*, 48, 2445–2456 doi: 10.1175/JPO-D-18-0005.1

C. S. Jones and P. Cessi. Size matters: another reason why the Atlantic is saltier than the Pacific (2017), *J.Phys. Oceanogr.*, 47, 2843–2859 doi: 10.1175/JPO-D-17-0075.1

P. Cessi and **C. S. Jones**. Warm-route versus cold-route interbasin exchange in the meridional overturning circulation (2017), *J.Phys. Oceanogr.*, 47,1981–1997 doi: 10.1175/JPO-D-16-0249.1

C. S. Jones and P. Cessi. Interbasin transport of the meridional overturning circulation (2016). *J. Phys. Oceanogr.*, 46, 1157–1169, doi: 10.1175/JPO-D-15-0197.1

C. S. Jones, C. Cenedese, E. P. Chassignet, P. F. Linden and B. R. Sutherland. Gravity current propagation up a valley (2015), *J. Fluid Mech.*, 762, 417–434, doi: 10.1017/jfm.2014.627

Submitted Articles/ Preprints

Q. Xiao, D. Balwada, **C. S. Jones**, M. Herrero-González, K. Shafer Smith and R. P. Abernathey. Reconstruction of Surface Kinematics from Sea Surface Height Using Neural Networks. doi: 10.22541/essoar.167898496.64825597/v1

External Funding

Ventilation and mixing of surface and intermediate waters in the tropical Atlantic: perspectives from Lagrangian particles and tracers.
NSF Physical Oceanography, $256,224, 01/01/2023 - 12/31/2025.

Collaborative Research: A global census of submesoscale energetics using in-situ drifter observations and a high resolution ocean model
NSF Physical Oceanography, with co-PIs Dhruv Balwada and Shane Elipot.
Texas A&M porition: $229,234, 06/01/2023 - 05/31/2025.

Teaching Experience

Texas A&M University

OCNG 310: Physical Oceanography, Spring 2023

I taught Physical Oceanography to upper-level undergraduates. I took an existing set of learning outcomes and developed materials based on these.

OCNG 609: Dynamical Oceanography, Spring 2022

I developed and taught this graduate Geophysical Fluid Dynamics course based on an existing syllabus.

Invited Talks

Finding the transport-relevant surface velocity field using Lagrangian filtering in LLC4320. NASA GMAO, March 2022.

Separating balanced and unbalanced flow at the ocean surface using Lagrangian filtering in LLC4320. Woods Hole Oceanographic Institution, November 2021.

Understanding Subpolar North Atlantic Heat Content Variability in the CESM Large Ensemble. NASA GISS, January 2021.

Understanding ocean heat and tracer transport, both today and at the Last Glacial Maximum. University of Washington, November 2020.

The global meridional overturning circulation in an idealized two-basin model. Stony Brook University, January 2019.

The global meridional overturning circulation in an idealized two-basin model. Yale University, September 2018.

Research Mentoring Experience

Texas A&M University
Undergraduate Mentor, Fall 2022-Spring 2023

I mentored an undergraduate student to investigate equatorial bottom Ekman transport using theory and 1-D numerical models.

Undergraduate REU Mentor, Summer 2022

I mentored an undergraduate student in a project that investigated the most likely paths of particles using the transition matrix.

Lamont-Doherty Earth Observatory
Undergraduate Summer Intern Mentor, Summer-Fall 2019

I mentored an undergraduate summer intern in a project that examined heat transport in the ECCOv4 data-assimilating ocean model. This student presented her findings at the Ocean Sciences Meeting 2020.

Inclusion-centered service & Outreach

Mentor for one undergraduate student from an under-served group through the *Promoting Geosciences Research, Education and Success (PROGRESS)* mentoring program, Fall 2022

Co-organizer of *Virtual Reality Simulations to Practice Bystander Interventions*, a workshop at AGU's Second National Conference for Justice in Geosciences, July 2022

Co-organizer of the *Rainbow Reception*, a networking event for LGBTQ+ people in the geosciences, Ocean Sciences Meeting 2022

Mentor for two undergraduates in Fall 2021 and one graduate student in Spring 2023, *TAMU Pride Mentors*

Co-creator, *Pyclub: Dive into python with oceanographers* a short course for high-schoolers, piloted Spring 2021

Volunteer, *Lamont Doherty Earth Observatory Open House*, October 2018 & 2019

Scientific and committee Service

Co-convener of *PL01: Multi-scale transport of oceanographic tracers: mean flow, stirring, and mixing*, a session at the Ocean Sciences Meeting 2022

Student Member, *Atmospheric and Oceanic Fluid Dynamics Committee*. American Meteorological Society [February 2014 - February 2018]

Reviewer: Journal of Physical Oceanography, Journal of Climate, Geophysical Research Letters, Journal of Advances in Modeling Earth Systems, Journal of Geophysical Research, Geoscientific Model Development

Fellowships

Lamont Postdoctoral Fellowship
Two-year postdoctoral fellowship
June 2018 - June 2020

Geophysical Fluid Dynamics Fellowship
Summer Program at Woods Hole Oceanographic Institution
June - August 2013

Technical Skills

Scientific computer programming in Matlab, python and FORTRAN. Experienced with git, github, cloud computing, big-data workflows and with python packages for handling large geoscience datasets, including xarray, xgcm, xmitgcm, zarr and kerchunk. Familiar with the MIT general circulation model (including the adjoint model and state estimation capabilities) and with MOM6. Proficient with LaTeX, UNIX and Microsoft Office.

Further Talks

Partitioning Heat transport by AMOC vs gyre in the CESM Large Ensemble. Texas Center for Climate Studies High-resolution modeling meeting, January 2023

Understanding Subpolar North Atlantic Heat Content Variability in the CESM Large Ensemble. GOC Workshop, Bornö, Sweden, July 2022

Lagrangian filtering preserves balanced flow that appears superinertial in the Eulerian frame. Ocean Sciences Meeting, March 2022

Overturning and mixing control ocean tracer distributions, with impacts for future climate. GFDL, June 2020.

Isopycnal Mixing Controls Deep Ocean Tracer Distributions. Ocean Sciences 2020.

Demystifying ocean tracer distributions: data science tools and applications to the Earth's climate. Texas A&M, January 2020.

Isopycnal Mixing and Ventilation of the Deep Ocean. Conference on Atmospheric and Oceanic Fluid Dynamics 2019.

The global meridional overturning circulation in an idealized two-basin model. Lamont-Doherty Earth Observatory. February 2019.

The effects of basin geometry on transport, stratification and salinity in the meridional overturning circulation. Physical Oceanography Dissertation Symposium (PODS), October 2018.

Size matters: another reason why the Atlantic is saltier than the Pacific. Conference on Atmospheric and Oceanic Fluid Dynamics 2017.