

Zachary M. Labe

CONTACT INFORMATION

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RESEARCH INTERESTS

large-scale climate dynamics • climate variability • atmospheric teleconnections • stratospheric dynamics • sea ice • science communication

EDUCATION

The University of California, Irvine, CA (GPA: 3.99/4.00)

Ph.D. Candidate in Earth System Science (expected May 2020)
Advisor: Dr. Gudrun Magnusdottir

The University of California, Irvine, CA (GPA: 3.98/4.00)

M.Sc. in Earth System Science, Sep 2017

Cornell University, Ithaca, NY

B.Sc. in Atmospheric Science, May 2015, *Distinction in Research*
Thesis: Anomalous Early Onset of Spring in the CESM Large Ensemble Project
Minor: Dyson Business Minor for Life Sciences

SCIENTIFIC RESEARCH EXPERIENCE

2015-Present

Graduate Research Assistant

Assessing influences of Arctic amplification and sea ice variability on the stratosphere and extreme weather in the mid-latitudes through global climate model experiments and historical observations

Advisor: Dr. Gudrun Magnusdottir, Earth System Science, University of California Irvine

Su. 2015

Research Assistant

Evaluated the magnitude, frequency, and dynamics of spring onset in the CESM Large Ensemble Project (LENS) through the implementation of the Extended Spring Indices Model

Advisor: Dr. Toby Ault, Earth and Atmospheric Science, Cornell University

2014-2015

Undergraduate Research Assistant

Analyzed Extended Spring Indices model forced by Berkley Earth System Temperature (BEST) reanalysis to understand early spring onset

Advisor: Dr. Toby Ault, Earth and Atmospheric Science, Cornell University

PUBLICATIONS

Refereed/Peer-Reviewed

- [4] **Labe, Z.M.**, Y. Peings, and G. Magnusdottir (2019), The effect of QBO phase on the atmospheric response to projected Arctic sea ice loss in early winter, *Geophysical Research Letters*, DOI:10.1029/2019GL083095. [\[Article\]](#)
- [3] **Labe, Z.M.**, Y. Peings, and G. Magnusdottir (2018), Contributions of ice thickness to the atmospheric response from projected Arctic sea ice loss, *Geophysical Research Letters*, DOI:10.1029/2018GL078158. [\[Article\]](#)
- [2] **Labe, Z.M.**, G. Magnusdottir, and H.S. Stern (2018), Variability of Arctic sea ice thickness using PIOMAS and the CESM Large Ensemble, *Journal of Climate*, DOI:10.1175/JCLI-D-17-0436.1. [\[Article\]](#)
- [1] **Labe, Z.M.**, T.R. Ault, and R. Zurita-Milla (2016), Identifying Anomalously Early Spring Onsets in the CESM Large Ensemble Project, *Climate Dynamics*, DOI:10.1007/s00382-016-3313-2. [\[Article\]](#)

Publications Submitted/in Preparation

- [1] Thoman, R.L., U. Bhatt, P. Bieniek, B. Brettschneider, M. Brubaker, S. Danielson, **Z.M. Labe**, R. Lader, W. Meier, G. Sheffield, and J. Walsh, 2019: The record low Bering Sea ice extent in 2018: Context, impacts and an assessment of the role of anthropogenic climate change [in "Explaining Extreme Events of 2018 from a Climate Perspective"]. *Bull. Amer. Meteor. Soc.* (*in revision*)

Non-refereed/Other

- [1] **Labe, Z.M.**, April 2015: Anomalously Early Onset of Spring in the CESM Large Ensemble. Cornell University. Undergraduate Honors Thesis. [\[PDF\]](#)

ORAL PRESENTATIONS

- [10] **Labe, Z.M.** Melting Ice: Context, Causes, and Consequences of Polar Amplification. *Kavli Frontiers of Science, National Academy of Science*, Jerusalem, Israel (Sep 2019). (**Invited**)
- [9] **Labe, Z.M.** Projections of a future Arctic climate. Geography Department, Irvine Valley College, CA (May 2019). (**Invited**)
- [8] **Labe, Z.M.**, G. Magnusdottir, and Y. Peings. Linking the Quasi-Biennial Oscillation and projected Arctic sea-ice loss to stratospheric variability in early winter. *20th Conference on Middle Atmosphere*, Phoenix, AZ (Jan 2019). [\[Abstract\]](#)
- [7] Magnusdottir, G., **Z.M. Labe**, and Y. Peings. The role of the stratosphere, including the QBO, in Arctic to mid-latitude teleconnections associated with sea-ice forcing. *2018 American Geophysical Union Annual Meeting*, Washington, DC (Dec 2018). [\[Abstract\]](#)
- [6] **Labe, Z.M.**, Y. Peings, H.S. Stern, and G. Magnusdottir. Arctic sea ice thickness variability and its influence on the atmospheric response to projected sea ice loss. *Machine Learning and Physical Sciences (MAPS) Symposium*, University of California, Irvine (May 2018).
- [5] **Labe, Z.M.** Disentangling Arctic climate change and variability. Geography Department, Irvine Valley College, CA (Apr 2018). (**Invited**)
- [4] Thoman, R. and **Z.M. Labe**. 2017-18 Sea Ice in Western Alaska during the 2017-18 Season: Historical Context and Possible Drivers. *Western Alaska Interdisciplinary Science Conference and Forum*, Nome, AK (Mar 2018).
- [3] **Labe, Z.M.**, G. Magnusdottir, and H.S. Stern. Variability and future projections of Arctic sea ice thickness. *Understanding the Causes and Consequences of Polar Amplification Workshop*, Aspen Global Change Institute, Aspen, CO (Jun 2017). [\[Recording\]](#)

- [2] **Labe, Z.M.** Communicating the future of Arctic climate change. Natural Sciences Division, Fullerton College, CA (Nov 2016). **(Invited)**
- [1] **Labe, Z.M.** Anomalously early onset of spring in the CESM Large Ensemble Project. *Earth and Atmospheric Science Undergraduate Research Symposium*, Cornell University, NY (May 2015).

POSTER PRESENTATIONS

- [5] Holman, A., R. Thoman, **Z.M. Labe**, and J.E. Walsh. Not Just Chance: Ocean and Atmospheric Factors in the Record Low Bering Sea Ice Winter of 2017-2018 and effects on health and safety, *2018 American Geophysical Union Annual Meeting*, Washington, DC (Dec 2018). [\[Abstract\]](#)
- [4] **Labe, Z.M.** Loss of Arctic sea ice thickness affects the large-scale atmosphere, *Arctic System Change Workshop* at NCAR, Boulder, CO (Apr 2018). [\[Poster\]](#)
- [3] **Labe, Z.M.**, G. Magnusdottir, and H.S. Stern. Arctic Sea Ice Thickness Variability and the Large-scale Atmospheric Circulation Using Satellite Observations, PIOMAS, and the CESM Large Ensemble, *14th Conference on Polar Meteorology and Oceanography*, Seattle, WA (Jan 2017). [\[Abstract\]](#) [\[Poster\]](#)
- [2] **Labe, Z.M.**, G. Magnusdottir, and H.S. Stern. Making the most of Arctic sea ice thickness observations, *Symposium on Recent Advances in Data Science*, University of California, Irvine (Oct 2016). [\[Poster\]](#)
- [1] **Labe, Z.M.** and T.R. Ault. Anomalously Early Onset of Spring in the CESM Large Ensemble Project, *14th Annual AMS Student Conference*, Phoenix, AZ (Jan 2015). [\[Poster\]](#)

FELLOWSHIPS AND AWARDS

Sep. 2019	Kavli Fellow, National Academy of Science
Jan. 2019	Outstanding Student Presentation Award - AMS Conference on Middle Atmosphere
Nov. 2018	Travel Award - AMS Conference on Middle Atmosphere
2016-2018	NSF NRT-DESE in Data Science and Physical Science Fellowship
Su. 2016	Data Science Initiative Fellowship, Department of Statistics, University of California, Irvine
Wi. 2016	Jenkins Family Graduate Fellowship in Earth System Science, Department of Earth System Science, University of California, Irvine
2014-2015	Fuerst Outstanding Library Student Employee Award Finalist, Cornell University

TEACHING AND OUTREACH

University of California, Irvine

Fa. 2019	Teaching Assistant, Terrestrial Hydrology
Sp. 2019	Teaching Assistant, Earth System Physics
Wi. 2019	Teaching Assistant, Weather Analysis
Fa. 2016	Teaching Assistant, Fundamental Processes in Earth and Environmental Studies

Cornell University

Su. 2015	Guest Lecturer, Severe Weather Phenomena
Sp. 2015	Teaching Assistant, Programming and Meteorology Software (Python)
Fa. 2014	Teaching Assistant, Basic Principles of Meteorology Lab

Related Educational Activities

May. 2019	<i>College and Career Day Experience</i> , MacArthur Fundamental Intermediate School, Santa Ana, CA (Presenter)
Apr. 2019	<i>Vista Verde School</i> , Weather and climate booth at an Earth Science Day fair, Irvine, CA (Presenter)
Mar. 2019	<i>Climate, Literacy, Empowerment And iNquiry (CLEAN)</i> , Weather and Climate Outreach event, MacArthur Fundamental Intermediate School, Santa Ana, CA (Presenter)
Feb. 2019	<i>Orange County Regional Science Olympiad</i> , Climate Science-Meteorology exam writer and proctor, Irvine, CA (Event Supervisor)
Feb. 2019	<i>Climate, Literacy, Empowerment And iNquiry (CLEAN)</i> , The Cryosphere Outreach event, MacArthur Fundamental Intermediate School, Santa Ana, CA (Presenter)
Dec. 2018	NOAA, Arctic Report Card - Update for 2018. [Contributed Graphics]
Oct. 2018	<i>Brews and Brains: TED-Style Talk</i> , Our Changing Arctic, Fireside Tavern, Costa Mesa, CA. (Invited Presenter). [Recording]
Oct. 2018	<i>Unified Irvine School District</i> , "Ask-A-Scientist/Engineer Night" at Rancho San Joaquin Middle School, Orange County, CA (Volunteer)
Sep 2018	<i>UC Irvine Graduate Orientation</i> , Session Title – Student Panel – Embracing Your New Graduate Life, Irvine, CA (Panelist)
May 2018	<i>Vista Verde School</i> , Weather and climate booth at an Earth Day fair, Irvine, CA (Presenter)
Feb. 2018	<i>Irvine Unified School District's 37th Annual Science Fair</i> , Physical science project judge, Irvine, CA (Volunteer)
Feb. 2018	<i>Climate, Literacy, Empowerment And iNquiry (CLEAN)</i> , Weather and Climate Outreach event, MacArthur Fundamental Intermediate School, Santa Ana, CA (Presenter)
Feb. 2018	<i>Orange County Regional Science Olympiad</i> , Climate Science-Meteorology exam writer and proctor, Irvine, CA (Event Supervisor)
Feb. 2018	<i>Climate, Literacy, Empowerment And iNquiry (CLEAN)</i> , The Cryosphere Outreach event, MacArthur Fundamental Intermediate School, Santa Ana, CA (Presenter)
Sep. 2017	<i>Unified Irvine School District</i> , "Ask-A-Scientist/Engineer Night" at Rancho San Joaquin Middle School, Orange County, CA (Volunteer)
Aug. 2017	<i>Unified Irvine School District</i> , "Ask-A-Scientist/Engineer Night" at Rancho San Joaquin Middle School, Orange County, CA (Volunteer)
Aug. 2017	<i>NASA DIRECT-STEM Program</i> , Assessing a changing Arctic (Invited Presenter).

Apr. 2017	<i>Climate Data Hackathon</i> , Looking for clues to changes in Arctic sea ice, University of California, Irvine. (Invited Presenter) . [Syllabus/GitHub]
Feb. 2017	<i>Irvine Unified School District's 36th Annual Science Fair</i> , Physical science project judge, Irvine, CA (Volunteer)
Feb. 2017	<i>Orange County Regional Science Olympiad</i> , Severe Storms-Meteorology exam writer and proctor, Irvine, CA (Event Supervisor)
Wi. 2017	Seminar Course – Teaching Topics in Earth System Science (Training)
Oct. 2016	<i>Unified Irvine School District</i> , "Ask-A-Scientist/Engineer Night" at Rancho San Joaquin Middle School, Orange County, CA (Volunteer)
Aug. 2016	<i>NASA DIRECT-STEM Workshop</i> , Data and Analysis of Arctic Climate Change in CMIP5 using Python (Instructor) . [Syllabus/GitHub]

PROFESSIONAL ACTIVITIES

2019-Present	Student Board Member, American Meteorological Society's Board on Societal Impacts
2018-Present	Journal Manuscript Referee [Publons] - <i>Geophysical Research Letters</i> , <i>Journal of Climate</i> , <i>Journal of Geophysical Research: Atmospheres</i> , <i>Journal of Glaciology</i> , <i>Polar Geography</i> ,
2017-Present	Vice President & Communications Chair, Student Chapter of the American Meteorological Society at the University of California, Irvine [Website]
2017-Present	Student Board Member, American Meteorological Society's Committee on Climate Variability and Change
2017-2018	Member, Student Communications Working Group, University of California, Irvine
Aug. 2017	Expert Contributor to the UCAR Climate Data Guide: "Sea Ice Thickness Data Sets: Overview & Comparison Table" [Website]
2014-2015	President, American Meteorological Society Student Chapter, Cornell University

Affiliations/Memberships

2016-Present	Association of Polar Early Career Scientists, Member
2015-Present	American Geophysical Union, Member
2014-Present	National Weather Association, Member
2009-Present	American Meteorological Society, Member

PROFESSIONAL TRAVEL

Field Work

May 2017	INTPART Arctic Field Summer Schools: Norway–Canada–USA collaboration, University of Tromsø, Norway (Workshops); Longyearbyen, Svalbard (R/V <i>Lance</i> - sea ice)
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Workshops

Apr. 2018	Arctic System Change Workshop, Mesa Lab, National Center for Atmospheric Research (NCAR), Boulder, CO
Jun. 2017	Understanding the Causes and Consequences of Polar Amplification, Aspen Global Change Institute, Aspen, CO

Conferences

Jan. 2017	97 th American Meteorological Society Annual Meeting, Seattle, WA
Jan. 2015	95 th American Meteorological Society Annual Meeting, Phoenix, AZ
Feb. 2014	94 th American Meteorological Society Annual Meeting, Atlanta, GA
Jan. 2013	93 rd American Meteorological Society Annual Meeting, Austin, TX

TECHNICAL SKILLS

Programming: Python, MATLAB, R, Fortran, Unix, HTML, T_EX, L^AT_EX, B_IB_TE_X
Software/Tools: NCL, PyNGL/PyNIO, NCO, CDO, GrADS, Git

Visit my [GitHub](#) !

GRADUATE COURSEWORK

- | | |
|--|--|
| <input type="checkbox"/> Atmospheric Chemistry & Physics | <input type="checkbox"/> Geoscience Modeling and Data Analysis |
| <input type="checkbox"/> Geophysical Fluid Dynamics | <input type="checkbox"/> Global Physical Climatology |
| <input type="checkbox"/> Global Biogeochemical Cycles | <input type="checkbox"/> Climate Dynamics |
| <input type="checkbox"/> Land Surface Processes | <input type="checkbox"/> Climate Change |
| <input type="checkbox"/> Ocean Processes | <input type="checkbox"/> Quantitative Methods in Ecology |

UNDERGRADUATE COURSEWORK

- | | |
|--|--|
| <input type="checkbox"/> Atmospheric Dynamics | <input type="checkbox"/> Remote Sensing and GIS |
| <input type="checkbox"/> Synoptic Meteorology II | <input type="checkbox"/> Statistics in Meteorology and Climatology |
| <input type="checkbox"/> Physical Meteorology | <input type="checkbox"/> Programming and Meteorology Software |
| <input type="checkbox"/> Climate Dynamics | <input type="checkbox"/> Ordinary and Partial Differential Equations |
| <input type="checkbox"/> Thermodynamics and Hydrostatics | |

NEWS AND MEDIA

Sep. 2019	<i>Euronews</i> , "How summer 2019 was hellish for the Arctic, the frontline of climate change and global warming" (Quoted). [Article]
Aug. 2019	<i>The Guardian</i> , "Alaska records warmest month ever in July with coastline barren of sea ice" (Quoted). [Article]
Aug. 2019	<i>TIME</i> , "Alaska's Sea Ice Has Its Lowest August Levels Ever" (Quoted). [Article]
Aug. 2019	<i>Mashable</i> , "Greenland's melting hits overdrive" (Quoted). [Article]
Jul. 2019	<i>Motherboard</i> , "Arctic Ice Is Crashing, and That's Bad News For Everyone" (Quoted). [Article]
Jul. 2019	<i>Wunderground</i> , "Heat Wave Heads North: Massive Week of Melting Likely in Arctic" (Quoted). [Article]

Jul. 2019	<i>The Washington Post, Capital Weather Gang</i> , "Europe's heat wave is about to bake the Arctic" (Quoted) . [Article]
Jun. 2019	<i>The Washington Post, Capital Weather Gang</i> , "The Arctic Ocean and Greenland ice sheet have seen record June ice loss" (Quoted) . [Article]
Jun. 2019	<i>Axios</i> , "Arctic melt goes into overdrive" (Quoted) . [Article]
Jun. 2019	<i>Mashable</i> , "There's some really intense melting in the Arctic right now" (Quoted) . [Article]
May 2019	<i>Earthier</i> , "The Last of the Arctic's Old Sea Ice Is on the Verge of Vanishing" (Quoted) . [Article]
Mar. 2019	<i>Carbon Brief</i> , "Arctic sea ice winter peak in 2019 is seventh lowest on record" (Quoted) . [Article]
Mar. 2019	<i>Axios</i> , "Vanishing ice in the Bering Sea drops to lowest level since 1850" (Quoted) . [Article]
Mar. 2019	<i>Mashable</i> , "The Bering Strait should be covered in ice, but it's nearly all gone" (Quoted) . [Article]
Feb. 2019	<i>CBS News</i> , "Week of remarkable weather extremes: Is this the new normal?" (Quoted) . [Article]
Feb. 2019	<i>Mashable</i> , "It's damn cold, but heat records in the U.S. still dominate" (Quoted) . [Article]
Jan. 2019	<i>Popular Science</i> , "Record cold temperatures don't mean the planet isn't warming" (Quoted) . [Article]
Oct. 2018	<i>Mashable</i> , "Things in the middle of the Arctic are getting really strange" (Quoted) . [Article]
Oct. 2018	<i>KUCI Radio</i> , "Arctic Sea Ice and Meteorology with Zack Labe" (Interview) . [Article]
Sep. 2018	<i>Euronews</i> , "Arctic heatwave could result in summer-like warmth for Alaska" (Quoted) . [Article]
Sep. 2018	<i>Carbon Brief</i> , "Arctic sea ice summer minimum in 2018 is sixth lowest on record" (Quoted) . [Article]
Aug. 2018	<i>Val 202 - Slovene radio station</i> "The Arctic is rapidly melting" (Interview) . [Article]
Jun. 2018	<i>Earthier</i> , "There's Way Too Little Ice Around Svalbard Right Now" (Quoted) . [Article]
May 2018	<i>The Washington Post, Capital Weather Gang</i> , "'Fallen off a cliff': Scientists have never observed so little ice in the Bering Sea in spring" (Quoted) . [Article]
Mar. 2018	<i>Earthier</i> , "Both Poles Are Having a Weird, Bad Year For Sea Ice So Far" (Quoted) . [Article]
Mar. 2018	<i>United States Senate – Senator Sheldon Whitehouse (D-RI)</i> , "Time to wake up: Climate Progress" (Supplied Graphic) . [Speech]
Feb. 2018	<i>PennLive</i> , "Harrisburg-area grad, scientist fuels buzz behind news that North Pole temps surged past freezing" (Interview) . [Article]
Feb. 2018	<i>Mashable</i> , "Drastic Arctic warm event stuns scientists, as record-breaking temperatures reach the North Pole" (Quoted) . [Article]
Feb. 2018	<i>The Washington Post, Capital Weather Gang</i> , "North Pole surges above freezing in the dead of winter, stunning scientists" (Quoted) . [Article]

Feb. 2018	<i>Earthar</i> , "Bering Sea Ice Is Disappearing When it Should Still Be Growing" (Quoted). [Article]
Feb. 2018	<i>USA Today</i> , "Arctic sea ice at record low January levels" (Quoted). [Article]
Feb. 2018	<i>UT Austin Geosciences</i> , "Social media: changing the science communication landscape" (Interview). [Article]
Dec. 2017	<i>USA Today</i> , "It's cold outside, but that doesn't mean climate change isn't real" (Quoted). [Article]
Sep. 2017	<i>The Sydney Morning Herald</i> , "Attacked from two sides: Antarctic sea ice hits another record low" (Quoted). [Article]
Aug. 2017	<i>The Verge</i> , "This Artist's New Landscape Studies are of Melting Glaciers" (Quoted). [Article]
Jul. 2017	<i>Climate Central</i> , "Here's How Much Arctic Sea Ice Has Melted Since the '80s" (Quoted). [Article]
Jun. 2017	<i>Climate Central</i> , "We Couldn't Monitor Larsen C Without These Satellites" (Quoted). [Article]
Apr. 2017	<i>Mashable</i> , "Arctic ice in retreat: NASA's airborne survey shows how global warming is transforming the Arctic" (Quoted). [Article]
Apr. 2017	<i>UCI News</i> , "UCI Doctoral student is helping people visualize climate change and its impact on the entire planet" (Interview). [Article]
Mar. 2017	<i>Carbon Brief</i> , "Sea ice falls to record lows in both the Arctic and Antarctic" (Quoted). [Article]
Mar. 2017	<i>Climate Central</i> , "Arctic Sea Ice Continues Its Astonishing Streak of Lows" (Quoted). [Article]
Feb. 2017	<i>The Washington Post, Capital Weather Gang</i> , "'Beyond the extreme': Scientists marvel at 'increasingly non-natural' Arctic warmth" (Quoted). [Article]
Jan. 2017	<i>UCI News</i> , "Climate change champions" (Interview). [Article]
Dec. 2016	<i>NPR</i> , "North Pole Temperatures Expected To Rise 50 Degrees Above Normal" (Interview). [Recording]
Dec. 2016	<i>Yahoo News</i> , "Bizarre North Pole temperatures cap off year of record-setting warmth" (Quoted). [Article]
Dec. 2016	<i>The Washington Post, Capital Weather Gang</i> , "Forecast: North Pole to warm 50 degrees above normal Thursday, near melting point" (Quoted). [Article]
Nov. 2016	<i>American Geophysical Union Blogs</i> , "A conversation with Zack Labe" (Interview). [Article]
Nov. 2016	<i>The Washington Post</i> , "The North Pole is an insane 36 degrees warmer than normal as winter descends" (Quoted). [Article]
Oct. 2016	<i>The Sydney Morning Herald</i> , "Polar heatwaves have ice in retreat at both ends of the planet" (Quoted). [Article]
Oct. 2016	<i>The Washington Post, Capital Weather Gang</i> , "Arctic sea ice is at a record low and could, in spurts, disappear within our lifetimes" (Quoted). [Article]
Oct. 2016	<i>Climate Central</i> , "This is What It's Like To Be a Young Climate Scientist" (Interview). [Article]

- Sep. 2016 *New York Times, Dot Earth*, "Arctic Summer Sea Ice – Going Down, Down, Down" (**Contributed**). [\[Article\]](#)
- Sep. 2016 *Mashable*, "Sailboat nears goal of circumnavigating the Arctic as sea ice plummets" (**Quoted**). [\[Article\]](#)
- Aug. 2016 *Cornell University*, "Early-onset spring models may indicate 'nightmare' for ag" (**Press Release**). [\[Article\]](#)
- Jul. 2016 *The Weather Junkies Podcast*, "The Science of Modeling Climate & Weather" (**Interview**). [\[Recording\]](#)

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PERSONAL INTERESTS

Vegetable gardening, travel, cooking, hiking, fishing, winter synoptic storms, long-range and seasonal weather forecasting