

# Zachary M. Labe

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## CONTACT INFORMATION

Ph.D. Candidate, 2101 Croul Hall  
Department of Earth System Science  
University of California, Irvine  
Irvine, California 92697-3100 USA

☎ 717.xxx.xxx  
✉ [zlabe@uci.edu](mailto:zlabe@uci.edu)  
🌐 <http://sites.uci.edu/zlabe/>  
🐦 @ZLabe

## RESEARCH INTERESTS

applied climate dynamics • climate variability • atmospheric teleconnections • Arctic sea ice • stratospheric dynamics • science communication

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## 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: Anomalously 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

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## PUBLICATIONS

*Refereed/Peer-Reviewed*

- [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] **Labe, Z.M.**, G. Magnusdottir, and Y. Peings (2018), Linking the Quasi-Biennial Oscillation to the Atmospheric Response to Projected Arctic Sea-Ice Loss in Early Winter. (*drafting paper*)

*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

- [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

- [4] 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). [\[Abstract\]](#)
- [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, *14<sup>th</sup> 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, *14<sup>th</sup> Annual AMS Student Conference*, Phoenix, AZ (Jan 2015). [\[Poster\]](#)

## FELLOWSHIPS AND AWARDS

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*

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*

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

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

## PROFESSIONAL ACTIVITIES

2019–Present	Student Board Member, American Meteorological Society’s Board on Societal Impacts
2018–Present	Journal Manuscript Referee <a href="#">[Publons]</a> - <i>Geophysical Research Letters</i> , <i>Journal of Climate</i> , <i>Journal of Glaciology</i>
2017–Present	Communications Chair, Student Chapter of the American Meteorological Society at the University of California, Irvine <a href="#">[Website]</a>
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” <a href="#">[Website]</a>
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 (Field Cruise - 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 <sup>th</sup> American Meteorological Society Annual Meeting, Seattle, WA
Jan. 2015	95 <sup>th</sup> American Meteorological Society Annual Meeting, Phoenix, AZ
Feb. 2014	94 <sup>th</sup> American Meteorological Society Annual Meeting, Atlanta, GA
Jan. 2013	93 <sup>rd</sup> American Meteorological Society Annual Meeting, Austin, TX

## TECHNICAL SKILLS

Programming: Python, MATLAB, R, Fortran, Unix, HTML, T<sub>E</sub>X, L<sup>A</sup>T<sub>E</sub>X, BibT<sub>E</sub>X  
Software/Tools: NCL, PyNGL/PyNIO, NCO, CDO, GrADS, Git

Visit my [GitHub](#) !

## GRADUATE COURSEWORK

- ☐ Atmospheric Chemistry & Physics
- ☐ Geophysics Fluid Dynamics
- ☐ Global Biogeochemical Cycles
- ☐ Land Surface Processes
- ☐ Ocean Processes
- ☐ Geoscience Modeling and Data Analysis
- ☐ Global Physical Climatology
- ☐ Climate Dynamics
- ☐ Climate Change
- ☐ Quantitative Methods in Ecology

## UNDERGRADUATE COURSEWORK

- ☐ Atmospheric Dynamics
- ☐ Synoptic Meteorology II
- ☐ Physical Meteorology
- ☐ Climate Dynamics
- ☐ Thermodynamics and Hydrostatics
- ☐ Remote Sensing and GIS
- ☐ Statistics in Meteorology and Climatology
- ☐ Programming and Meteorology Software
- ☐ Ordinary and Partial Differential Equations

## NEWS AND MEDIA

- Oct. 2018 *Mashable*, “Things in the middle of the Arctic are getting really strange” (Quoted). [\[Article\]](#)
- Oct. 2018 *KUCI Radio*, “Arctic Sea Ice and Meteorology with Zack Labe” (Interview). [\[Article\]](#)
- Sep. 2018 *Euronews*, “Arctic heatwave could result in summer-like warmth for Alaska” (Quoted). [\[Article\]](#)
- Sep. 2018 *Carbon Brief*, “Arctic sea ice summer minimum in 2018 is sixth lowest on record” (Quoted). [\[Article\]](#)
- Aug. 2018 *Val 202 - Slovene radio station* “The Arctic is rapidly melting” (Interview). [\[Article\]](#)
- Jun. 2018 *Earther*, “There’s Way Too Little Ice Around Svalbard Right Now” (Quoted). [\[Article\]](#)
- May 2018 *The Washington Post*, *Capital Weather Gang*, “Fallen off a cliff’: Scientists have never observed so little ice in the Bering Sea in spring” (Quoted). [\[Article\]](#)
- Mar. 2018 *Earther*, “Both Poles Are Having a Weird, Bad Year For Sea Ice So Far” (Quoted). [\[Article\]](#)
- Mar. 2018 *United States Senate - Senator Sheldon Whitehouse (D-RI)*, “Time to wake up: Climate Progress” (Supplied Graphic). [\[Speech\]](#)
- Feb. 2018 *PennLive*, “Harrisburg-area grad, scientist fuels buzz behind news that North Pole temps surged past freezing” (Interview). [\[Article\]](#)
- Feb. 2018 *Mashable*, “Drastic Arctic warm event stuns scientists, as record-breaking temperatures reach the North Pole” (Quoted). [\[Article\]](#)
- Feb. 2018 *The Washington Post*, *Capital Weather Gang*, “North Pole surges above freezing in the dead of winter, stunning scientists” (Quoted). [\[Article\]](#)
- Feb. 2018 *Earther*, “Bering Sea Ice Is Disappearing When it Should Still Be Growing” (Quoted). [\[Article\]](#)
- Feb. 2018 *USA Today*, “Arctic sea ice at record low January levels” (Quoted). [\[Article\]](#)
- Feb. 2018 *UT Austin Geosciences*, “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	<i>New York Times, Dot Earth</i> , "Arctic Summer Sea Ice – Going Down, Down, Down" (Contributed). [Article]
Sep. 2016	<i>Mashable</i> , "Sailboat nears goal of circumnavigating the Arctic as sea ice plummets" (Quoted). [Article]
Aug. 2016	<i>Cornell University</i> , "Early-onset spring models may indicate 'nightmare' for ag" (Press Release). [Article]
Jul. 2016	<i>The Weather Junkies Podcast</i> , "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