YAKELYN R. JAUREGUI

Contact

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Method Skills

- Modeling
- Data analysis
- Machine Learning
- Programing Languages: Bash, Emacs, Git, Python, Matlab, LaTex, Fortran
- Software Development and Contributions: ai2cm-clould_machine_learning, large-scale precipitation diagnostic tool for climate models
- Visualization and Design: Matplotlib, Latex, HTML, Canva, Concepts
- Platforms: HPC, Jupyterlab, Github

Language

English

Spanish (native)

About Me

I am a Peruvian Atmospheric Scientist, fascinated by the complex interplay of the atmosphere-ocean coupling. At the intersection of observations, modeling, and machine learning, I explore the intricate relationships of the MJO and ENSO. My passion stems from a deep desire to understand physical processes in both the atmosphere and ocean and how they are or will change in response of global warming.

Experience

Sep 2017 to June 2024

Graduate Researcher   **University of Washington**

I investigated the MJO-ENSO interaction from the perspective of the multiscale air-sea interaction from daily to year-to-year scales, including the diurnal cycle, MJO, and ENSO. I used observations, satellites, and modeling approaches to improve the understanding of physical processes influencing the variability of the western Pacific warm pool in response to MJO-ENSO coupled forcing.

Jun to Sep 2022

Climate Modeling Intern   **Allen Institute for AI (AI2)**

I developed and implemented Machine Learning software to improve the cloud representation in Global climate models, to reduce radiative flux biases. I improved performance of an offline Python port of the physics radiation scheme, enabling faster computation of radiative fluxes.

Sep to Dec 2021

Climate Variability Intern   **NCAR**

The overarching goal was to better understand the ocean-atmosphere interactions over the western tropical Pacific in the Community Earth System Model (CESM2). As part of the UCAR NextGen Fellowship I visited Judith Berner during Fall 2021. I applied a new MJO index - the Large-Scale Precipitation tracking (LPT) index - to CESM2 simulations and I compared them with satellite observations (TRMM-TMPA).

Jan to Mar 2020

Teaching assistant   **University of Washington**

Worked under Professor Kathleen Huybers, leading weekly quiz/discussion sections for undergraduates, ATMS 111: Global warming understanding the Issues. I developed and graded quizzes and exams; held weekly office hours to answer student questions.

March 2013 to Dec 2016

Research assistant   **Peruvian's Geophysical Institution**

I provided scientific support for observing and predicting El Niño–Southern Oscillation (ENSO) conditions using observations, re-analysis data, atmospheric-ocean models, and other data sources. I developed and validated operational products and created/presented presentations supporting ENSO's regional impacts. I also engaged in discussions about our operational products with decision makers and stakeholders.

Jan to March 2013

Research intern   **Peruvian's Geophysical Institution**

I worked in a multidisciplinary group assessing the "Impact of Climate Variability and Climate Change in the Tumbes Mangrove Ecosystem". I created a CMIP5 global models database and automated data pre-processing in Linux using shell scripts and Fortran. I assisted in developing an operational-automated product to observe weather event evolution.

Education

Sep 2017 to June 2024
Ph.D. in Atmospheric Sciences - Data Science option   **University of Washington**
Thesis: Multiscale Air-Sea Interactions of the MJO and Onset of El Niño: A New perspective of Precipitation and Density Current Coupling.
Advisor: Professor Shuyi S. Chen

Sep 2017 to March 2020
M.Sc. in Atmospheric Sciences   **University of Washington**
Thesis: MJO-induced Warm Pool Eastward Extension Prior to the Onset of El Niño: An Observational study.
Advisor: Professor Shuyi S. Chen

Sep 2009 to December 2013
B.S. Meteorology   **La Molina National University of Agriculture, Peru**
Thesis: Estimating the effect of climate change on precipitation in the northern coast of Peru using global climate models simulations.
Advisor: Dr. Ken Takahashi Guevara

Publications

Jauregui, Y.R., Chen, S. S., Zhang, C., McPhaden, M. J., & Jin, F.-F. (**2024**). MJO-induced Density Currents and Their Contribution to El Nino Onset Observed using Reanalysis Data from 1993-2022. *J. Geophys. Res.: Oceans (in prep)*.

Jauregui, Y.R., & Chen, S. S. (**2024**). Freshwater Ocean Currents Induced by the MJO: A Key Player in Warm Pool Eastward Extension during the Onset of El Niño. *J. Geophys. Res.: Oceans*.

Henn, B., **Jauregui., YR.,** Clark. C., et al. (**2024**). A machine learning parameterization of clouds in a coarse-resolution climate model for unbiased radiation. *J. of Advances in Modeling Earth Systems*.

Jauregui, Y. R. & Chen, S. S. (**2023**) MJO-induced Warm Pool Eastward Extension Prior to the Onset of El Niño: Observations from 1998-2019. *J. Clim*.

Segura, H., Junquas, C., Espinoza, J.C. et al (**2019**). New insights into the rainfall variability in the tropical Andes on seasonal and interannual time scales. *Clim Dyn*.

Jauregui, R., Takahashi, K (**2018**). Simple physical-empirical model of the precipitation distribution based on a tropical sea surface temperature threshold and the effects of climate change. Clim Dyn.

Awards

- NASA Future Investigators in NASA Earth and Space Science and Technology (FINESST) issued by NASA Earth Science Research Program division in Sep 2021. Awarded $135,000 from 2021-2023 towards the completion of a proposed research project.

- NCAR/UCAR NEXT GENERATION FELLOWSHIPNCAR/UCAR NEXT GENERATION FELLOWSHIP issued by University Corporation for Atmospheric Research (UCAR) in Sep 2020. Awarded $40,000 for 2020-2021 towards the completion of my research project as part of my doctoral degree in atmospheric sciences at the University of Washington.

- CICOES Graduate Student Award ProgramCICOES Graduate Student Award Program. Issued by The Cooperative Institute for Climate, Ocean, and Ecosystem Studies (CICOES) in Jun 2020 to fund my research assistantship during Summer 2020.

- Scholarship for Peruvian Citizens for study a Doctoral program abroadScholarship for Peruvian Citizens for study a Doctoral program abroad. Issued by Peruvian Government - FONDECYT · Awarded almost $300,000 towards the completion of my Ph.D. degree in Atmospheric Sciences for studying the Madden-Julian Oscillation and El Niño Southern Oscillation connection.

Academic Service

- Atmospheric Sciences Department Graduate Mentor, University of Washington
- Atmospheric Sciences Department Undergraduate Mentor, University of Washington
- Graduate Mentor and member of the Society of Latinxs/Hispanics in Earth and Space Science.
- Atmospheric Science Women's Group Member, University of Washington
- Atmospheric Sciences Department Community Outreach Member, University of Washington

Professional Activities

Tackling Climate Change with Machine Learning, September 30th- 2022
"Machine learning for cloud formation in climate models", an in-person event organized by Climate Change AI and Women in "Machine Learning and Data Science.
AGU Ocean Science Meeting, virtual, February 2022 "Understanding Coupled Atmosphere-Ocean Boundary Layer Processes and Their Role in the Multiscale Interactions of the MJO and Onset of El Niño". Poster.

Scripps Institution of Oceanography, November 2nd - 2022
 "Understanding Coupled Atmosphere-Ocean Boundary Layer Processes and Their Role in the Multiscale Interactions of the MJO and Onset of El Niño". An in-person seminar organized by Climate, Atmospheric Sciences, and Physical Oceanography (CASPO).

AGU Fall Meeting 2021, New Orleans, LA December 2021
"Understanding Coupled Atmosphere-Ocean Boundary Layer Processes and Their Role in the Multiscale Interactions of the MJO and Onset of El Niño". Oral presentation.

Tropical Pacific Observing Needs to Advance Process Understanding and Representation in Models Workshop, May 2021
"Understanding Coupled Atmosphere-Ocean Boundary Layer Processes and Their Role in the Multiscale Interactions of the MJO and Onset of El Niño". Oral presentation.

Lecture on Tropical Meteorology, December 2020
"The Madden-Julian Oscillation (MJO) and El Niño Southern Oscillation (ENSO)", virtual lecture for ATMS 220 at the University of Washington.

AGU Fall Meeting 2020, virtual December 2020
"Multiscale Processes in MJO-induced Warm Pool Eastward Extension prior to the Onset of 2018 El Niño". Oral presentation.

Colorado State University, November 2020
"Understanding MJO – Induced Eastward Extension of Warm pool and the onset of El Niño", a virtual seminar organized by the large-scale dynamics group.

National Center for Atmospheric Research, July 2020 "Multiscale Processes in MJO-induced Warm Pool Eastward Extension prior to the Onset of 2018 El Niño", a virtual talk organized by the Climate and Global Dynamics Division.

AGU Ocean Science Meeting, San Diego, CA February 2020
"The Warm pool eastward extension associated with the MJO events occurred prior to the Onset of El Niño event 2018". Poster.

AGU Fall meeting 2019, San Francisco, CA December 2019
"Post-MJO warm pool eastward extension and the onset of El Niño". Poster.

US CLIVAR workshop, Boulder, CO May 2019
" Understanding MJO – Induced Eastward Extension of Warm pool and the onset of El Niño. - Atmospheric Convection and Air-Sea interactions over the Tropical Ocean". Poster.

University of Grenoble Alpes, July 2017 "Simple physical-empirical model of the precipitation distribution based on a tropical sea surface temperature threshold and the effects of climate change", an in-person seminar organized by the climate group.

AGU Fall Meeting 2018, Washington, D.C, December 2018
"Post-MJO warm pool eastward extension and the onset of El Niño". Oral presentation.

WCRP VAMOS/CORDEX Workshop on Latin American and the Caribbean, Lima – Peru 2013
"Simple physical-empirical model of the precipitation distribution based on a tropical sea surface temperature threshold and the effects of climate change". Oral presentation.

Third Congress of Physical Oceanography, Meteorology and Climate of the South Eastern Pacific held in Santiago – Chile 2013
"Simple physical-empirical model of the precipitation distribution based on a tropical sea surface temperature threshold and the effects of climate change". Oral presentation.