Héctor A. **Inda Díaz**

Physicist and ocean/atmosphere modeler. Weather and climate extreme events scientist interested in climate risk, big data analysis, and high-performance computig

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Summary

I am a physicist, physical oceanographer, and atmospheric scientist, working as a postdoctoral scholar at the Lawrence Berkeley National Laboratory. My latest research focuses on extreme weather, climate events, and climate change through numerical models, statistics, and big data analysis. I have strong physics, mathematics, and fluid dynamics education. I am a computer science enthusiast, with strong skills and experience in C and Python, and an increasing interest and training in machine learning. I am actively transitioning into climate risk analysis, statistics modeling, and data science.

Work Experience

Lawrence Berkeley National Laboratory

Berkeley, CA, USA

Postdoctoral Scholar

Jun. 2022 - May. 2023

- Setup and implementation of the Regionally Refined Energy Exascale Earth System Model (RRM-E3SM).
- Grid design and implementation of RRM-E3SM with a 14 km resolution over Mexico and Southeast US.
- Porting of E3SM to BigRed200 Indiana University's supercomputer.
- Development of a Python library to analize and plot RRM-E3SM output.

Lawrence Berkeley National Laboratory / UC Davis

Berkeley/Davis, CA, USA

Graduate Student Research Assistant

Jun 2016 - Dec 2021

- Statistical analysis of evapotranspiration and heat stress analysis in the central United States under historical and future climates.
- Convective self-aggregation in convection-resolving models (Weather Research and Forecasting model).
- Reducing uncertainty in our understanding of atmospheric rivers (ARs) through use advanced statistical and data analysis techniques.
- Writing of massively parallel data analysis routines towork on large ensembles of climate models, and development of a Python library for self-aggregation data in CRM output. Development of five statistical AR size estimation method, including a 3D Lagrangian backtrajectory model in C/CUDA, with the possibility to run it from python in CPUs or GPUs.
- Analysis of TBs of historical and future climate simulations data from reanalyses and climate models (including CMIP5 and CMIP6).
- Published peer-reviewed literature. As first author: 1 published and 2 in revision. As collaborator: 3 published articles.
- Presented research results in 8 international scientific conferences (4 poster and 4 oral presentations).

Education

University of California Davis

Davis, CA, USA

Ph.D. in Atmospheric Science

October 2015 - April 2021

- Supervisor: **Dr. Travis A. O'Brien** (LBNL, Indiana University Bloomington).
- Data analysis of extreme weather and climate events (extreme wind/precipitation, heat waves, atmospheric rivers). Statistical and numerical analysis tools development. Numerical modeling of the atmosphere.
- Numerical model: running and development. Data analysis toolkits development.
- Use of Python, C, and CUDA for data analysis and numerical modeling; Zoom, Google Docs/Meets, Overleaf, and Slack for team collaborating; and git for version control. High-performance computing centers: DOE's NERSC (Edison and Cori).
- UC Mexus-CONACYT doctoral fellowship recipient.

Ensenada Center for Scientific Research and Higher Education (CICESE)

Ensenada, Baja California, Mexico

M.S. in Physical Oceanography

August 2012 - April 2015

- Supervisor: **Dr. Alejandro F. Parés Sierra** (Department of Phsyical Oceanography (CICESE).
- Numerical Modeling of the Ocean. Data analysis of Regional Ocean Modeling System (ROMS).
- Lagrangian Characteristics and Connectivity In the Mexican Pacific Ocean.
- Fortran for ocean modeling. Fortran, Ferret, and Matlab for data analysis.
- CONACYT *Programa Nacional de Posgrados de Calidad* Master Fellowship Recipient.

National Autonomous University of Mexico (UNAM)

Mexico City, Mexico

B.S. in Physics

August 2006 - July 2012

- Dissertation: Discordant alternans in a ischemic cardiac tissue. Laboratory for Biophysics and Excitable Systems.

Skills

Programming	Python, C, C++, Fortran, Matlab, Ferret, CUDA, Numerical Methods, Parallel and High-performance computing, Pytorch
Operating Systems	Linux, Mac OS, Windows.
Languages	Spanish (native), English (fluent speaking, writing, and reading), Russian (basic).
Collaborating	Overleaf, GitHub, Bitbucket, Slack, Zoom.
Research	Scientific writing, presentation, and communication, information synthesis, data analysis, statistics, numerical modeling, literature review, problem solving, team collaboration.