Idalia A. Machuca

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Education

M.Sc. in Physical Oceanography **2015 – 2019**
University of British Columbia Vancouver, Canada

B.Sc. in Geophysics, Minor in Oceanography **2010 – 2014**
University of British Columbia Vancouver, Canada

A.Sc. in Physics and Mathematics **2008 – 2010**
St. John's College Junior College Belize City, Belize

Experience

Principle Power **Emeryville, California**

Principle Power is a leading global technology developer for the offshore wind energy market. Principle Power's proven technology, the WindFloat®, is a semi-submersible wind turbine foundation for deep-water offshore wind projects.

- **Metocean Engineer** **Nov 2019 – Present**
  - Performed metocean (meteorological-oceanographic) analyses for 10 multi-GW commercial offshore wind projects and 2 federally-funded R&D studies as Principle Power's only in-house metocean specialist and contact for all customers.
  - Defined statistical and analytical metrics and developed software tools to analyze environmental data and develop design criteria for multiple engineering disciplines (aerodynamic and hydrodynamic design of the WindFloat® platform, mooring, and cable systems) throughout the various stages of project execution (feasibility, design, certification, installation).
  - Led the site selection assessment of R&D studies funded by the U.S. DOE and NYSERDA by characterizing wind, wave, and current conditions, bathymetry and soil conditions, and potential hazards in areas of interest.
  - Authored 16 technical reports associated with financial milestones of commercial offshore wind projects and R&D studies in accordance with wind energy industry techniques and standards and internal QA/QC procedures.
  - Managed metocean needs of departments across multiple geographies, domains of expertise, and levels of organization.

University of British Columbia **Vancouver, Canada**

The Mesoscale Ocean and Atmospheric Dynamics Group at the University of British Columbia conducts oceanographic research and coastal risk assessment using hindcast, nowcast, and forecast numerical modelling and field techniques.

- **Graduate Researcher** **Sep 2015 – May 2019**
  - Developed a high-resolution numerical ocean model to investigate complex flow dynamics in the Canadian Arctic Ocean.
  - Quantified the impact of environmental forcing and topography on currents along coastlines and submarine canyons.
  - Performed data processing, analysis, and visualization on multi-dimensional, spatiotemporal data from ocean and atmospheric models and instrumentation, including wind, current, temperature, salinity, and nitrate data.
  - Performed model evaluation using published results of lab experiments, theoretical models, and field measurements.
- **Research Assistant** **Jul 2014 – Apr 2015**
  - Investigated oceanographic processes causing storm surge along the Salish Sea coast using hindcast numerical modelling.
  - Demonstrated the regional effects of tides and river outflow using statistical methods and trajectory computations.
  - Assessed and revised research priorities by conducting workshops with community, government, and industry stakeholders.

University of British Columbia **Vancouver, Canada**

- **Graduate Teaching Assistant** **Sep 2015 – Dec 2017**
  - Supported instructors by planning and delivering lessons, grading student assignments, facilitating lab exercises, supervising examinations, and providing course feedback.
- **Writer (Earth Matters: Volume 5, 2019)** **Jan 2019 - Jul 2019**
  - Authored feature profiles on world-class academic leaders and news articles on student initiatives and community events in the Earth, Ocean and Atmospheric Sciences department of the University of British Columbia (`www.eoas.ubc.ca/news-events/earth-matters`).
- **Exam Invigilator (UBC Access and Diversity)** **Sep 2016 - Apr 2017**
  - Facilitated academic examinations for students with disabilities in private and group spaces, set up adaptive and computer equipment, conducted accurate and confidential record keeping, and efficiently communicated with senior coordinators.

David Suzuki Foundation **Vancouver, Canada**

A Canadian non-profit organization aimed at finding solutions to environmental problems through science-based research and policy work

- **Public Information Representative** **Jun 2014 - Apr 2015**
  - Performed as the foundation's first point of contact using a thorough understanding of its mission and vision, ongoing campaigns, and the state of current environmental issues.

Oceana Belize **Belize City, Belize**

The largest international organization focused on protecting and conserving marine ecosystems and endangered species.

- **Science Educator and Web Developer** **Jun 2013 - Sep 2013**
  - Developed lessons about the environmental issues affecting Belize and the world, such as climate change, plastic pollution, energy consumption, mangroves, and threats to biodiversity.
  - Researched current and relevant information available for Belize and organized lessons and supplementary materials, including classroom activities and assignments.
  - Worked in collaboration with the Oceana Belize staff to collect data, scientific reports, and relevant photographs.
  - Created a website `www.oceanateachbz.com` to host the environmental lessons and promoted the website to the Belizean public via televised news reports and newspaper articles

Volunteer Experience

- **Workshop Helper** **Sep 2018 – Oct 2018**
  PyLadies Vancouver Vancouver, Canada
- **Seminar Coordinator** **May 2017 – Dec 2017**
  Physical Oceanography Seminar Series University of British Columbia
- **Workshop Helper** **Oct 2014 – Sep 2016**
  The Carpentries Vancouver, Canada

Workshops

- **BC Data Science Workshop** — **May 2018**
  Pacific Institute for the Mathematical Sciences — Vancouver, Canada
- **Instructional Skills Workshop** — **Mar 2018**
  UBC Centre for Teaching, Learning and Technology — Vancouver, Canada

Conference Presentations

- **Ocean Sciences Meeting** — **2018**
  Effects of a Dynamically Wide Submarine Canyon on Coastal Currents During an Upwelling Event — Portland, USA
- **3 Minute Thesis** — **2018**
  Mackenzie Canyon: a Submarine Oasis — Vancouver, Canada
- **UBC Jumpstart Program** — **2017**
  Thinking in the Sciences — Vancouver, Canada
- **Canadian Meteorological and Oceanographic Society (CMOS) Congress** — **2017**
  Characterization of the Flow Dynamics in a Wide, Arctic Canyon — Toronto, Canada
- **INCISE International Submarine Canyon Symposium** — **2016**
  Numerical Simulation Exploring the Mechanisms Driving Upwelling in Mackenzie Canyon — Victoria, Canada
- **MEOPAR Mobilizing Science Knowledge and Research Symposium** — **2015**
  Communicating Storm Surge Predictions in the Strait of Georgia — Halifax, Canada

Publications

- Machuca, Idalia A. "Circulation and Upwelling in Mackenzie Canyon, a Dynamically Wide Submarine Canyon in the Beaufort Sea." MSc Thesis. University of British Columbia. 2019.
- Soontiens, N., Allen, S., Latornell, D., Le Souef, K., Machuca, I., Paquin, J.-P., Lu, Y., Thompson, K., Korabel, V. "Storm Surges in the Strait of Georgia Simulated with a Regional Model." Atmosphere-Ocean 54 1-21. 2016.

Skills

- Programming: Python (NumPy, SciPy, Pandas, Matplotlib, Seaborn, Bokeh, Jupyter Notebook), MATLAB, command line.
- Software: NEMO, AGRIF, QGIS, NREL ReX, Windographer, Open Data on AWS, Git, LaTeX, Microsoft Office Suite.
- Environmental datasets: ERA5, WRF, Vortex, Oceanweather GROW, GHCN, GOFS (HYCOM + NCODA Global Analysis and Reanalysis), WAVEWATCH III, SWAN, MIKE 21, GEBCO, usSEABED, field measurements (lidar, CTD, ADCP).