

# Nishchitha Sandeepana Silva Etige

Boston, MA

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## Education

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### Ph.D. in Earth and Environment

May 2024

*Department of Earth and Environment, Boston University*

*Advisor: Professor Bruce Anderson*

### MS in Marine Science

August 2019

*School for Marine Science and Technology, University of Massachusetts Dartmouth*

*Advisor: Professor Avijit Gangopadhyay*

### BSc in Aquatic Resources Technology (Second Class Upper Division)

October 2015

*Uva Wellassa University of Sri Lanka*

## Research Interest

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Investigating coupled large-scale ocean-atmosphere interactions and their long-term influence on the climate extremes, marine environment and biosphere.

## Research Experience

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### Senior Research Associate I

2023 – Present

*Atmospheric and Environmental Research Inc., Verisk Analytics*

- Investigating the seasonal to decadal variability of sea level in the North Pacific.
- Analyzing low-frequency variability of Pacific Ocean sea-level and its links to known climate modes.
- Developing process-oriented diagnostics for NOAA Model Diagnostics Taskforce Framework.

### Doctoral Candidate

2019 – 2024

*Department of Earth and Environment, Boston University*

- Studied links between Kuroshio Current Extension variability and Pacific Decadal Precession.
- Studied how Kuroshio Extension variations link with the occurrence of Marine Heatwaves in the Gulf of Alaska region.

### NCAR Earth System Science Intern (NESSI)

2023

*National Center for Atmospheric Research (NCAR)*

- Studied the presence of links between Kuroshio Extension and Pacific Decadal Precession in the high-resolution Community Earth System Model using NCAR's high performance computing resources in collaboration with Ocean Section of NCAR's Climate and Global Dynamics Lab.

### Warren Mcleod Summer Fellow

2022

*Boston University Marine Program*

- Studied the influence of Kuroshio Extension on northeast Pacific marine environments in terms of Marine Heatwave formations.

**Pardee Summer Fellow****2021***The Frederick S. Pardee Center for the Study of the Longer-Range Future, Boston University*

- Studied the links between the Kuroshio Extension variations and the formation of Marine Heatwaves in the Gulf of Alaska via atmospheric modifications.

**Graduate Research Assistant****2018 - 2019***Oceanographic Modeling and Analysis Laboratory, Department of Estuarine and Ocean Science, School for Marine Science and Technology, University of Massachusetts Dartmouth*

- Conducted a census and developed a geo-coded database of the Gulf Stream's Warm Core Rings.
- Studied the long-term variability, regimes, and survival of the Gulf Stream's Warm Core Rings.

**Consultant****2017***International Union for Conservation of Nature (IUCN), Sri Lanka Office*

- Developed and supplied inputs for the determination of a new marine protected area in the Gulf of Mannar, Indian Ocean.
- Studied the willingness of fishing communities for the conservation of Dugong and Seagrass in the Gulf of Mannar and Palk Bay, Indian Ocean.

**Intern****2015 - 2017***International Water Management Institute (IWMI), Sri Lanka*

- Analyzed hydrological data for multiple climate change scenarios to understand the hydrological impacts of climate change in the Tana River basin, Kenya.
- Studied the potentials of utilizing groundwater and surface water conjunctively for irrigation in North-Central Sri Lanka.
- Processed and maintained a geo-coded agro-well database for North-Central Sri Lanka to determine potential cropping intensities.
- Developed a repository of case studies to utilize as input for a policy model established for the management of reservoirs in Kazakhstan.

**Undergraduate Research****2015***Uva Wellassa University*

- Thesis research on the effects of climate change driven sea-level rise on a unique islet complex at a sea-lagoon interphase on the west coast of Sri Lanka.

**Volunteer Researcher****2013 - 2017***Water Resources Science and Technology, Sri Lanka*

- Studied the impacts of small-scale hydropower generation on mountain streams of Sri Lanka.
- Conducted a case study on small-scale hydropower generation impacts on mountain streams.

**Teaching Experience**

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**Senior Teaching Fellow****2022 Spring***Department of Earth and Environment, Boston University*

- **Instructor:** Natural Environments: The Atmosphere EE101

**Teaching Fellow****2019 - 2023***Department of Earth and Environment, Boston University*

- Environmental Change and Sustainability EE100
- Natural Environments: The Atmosphere EE101
- Introduction to Climate and Earth System Science EE107
- Introduction to Oceanography EE144

**Teaching Assistant****2018 - 2019***School for Marine Science and Technology, University of Massachusetts Dartmouth*

- Introduction to Climate Sciences MAR115

**Publications****Journal Articles**

**Silva, E.N.S., Anderson, B.T. 2024: Influence of Kuroshio Extension's sea surface temperature variability on the North Pacific atmosphere and Pacific Decadal Precession.** *Clim Dyn* 62, 8947–8960. <https://doi.org/10.1007/s00382-024-07372-2>

**Silva, E.N.S., Anderson, B.T. 2023: Northeast Pacific marine heatwaves linked to Kuroshio Extension variability.** *Commun Earth Environ* 4, 367. <https://doi.org/10.1038/s43247-023-01010-1>

Silver, A., Gangopadhyay, A., Gawarkiewicz, G., **Silva, E.N.S.** and Clark, J. 2021. **Interannual and seasonal asymmetries in Gulf Stream Ring Formations from 1980 to 2019.** *Scientific Reports*, 11(1), pp.1-7. <https://doi.org/10.1038/s41598-021-81827-y>

**Silva, E.N.S., A. Gangopadhyay, G. Fay, A., M. Welandawe, G. Gawarkiewicz, A. M. Silver, and J. Clark, 2020: A survival analysis of the warm core rings of the Gulf Stream** *Journal of Geophysical Research: Oceans*, 125(10), p.e2020JC016507. <https://doi.org/10.1029/2020JC016507>

Gangopadhyay, A., Gawarkiewicz, G., **Silva, E. N. S.**, Silver, A. M., Monim, M., & Clark, J. 2020. **A census of the warm-core rings of the Gulf Stream: 1980–2017.** *Journal of Geophysical Research: Oceans*, 125, e2019JC016033. <https://doi.org/10.1029/2019JC016033>

Gangopadhyay, A., Gawarkiewicz, G., **Silva, E. N. S.**, Monim, M., & Clark, J. 2019. **An observed regime shift in the formation of Warm core rings from the Gulf Stream.** *Scientific Reports*, 9(1). doi:10.1038/s41598-019-48661-9

Muthuwatta L., Sood A., McCartney M., **Silva E.N.S.**, Opere A. 2018. **Understanding the impacts of climate change in the Tana river basin, Kenya.** *Proc IAHS* 379:37-42. <https://doi.org/10.5194/piahs-379-37-2018>

Silva E.I.L. and **Silva E.N.S.** 2017. **Mini-hydro, an injurious novel threat to highland forest ecosystems of Sri Lanka.** *The Sri Lanka Forester* 38:67-73.

Silva E.I.L., Manthrithilake H., Pitigala D., **Silva E.N.S.** 2014. **Environmental flow in Sri Lanka: Ancient anicuts versus modern dams.** *Sri Lanka Journal of Aquatic Sciences* 19:3-14. doi: 10.4038/sljias.v19i0.7447

Silva E.I.L., Rott E., Thumpela I., Athukorala N., **Silva E.N.S.** 2013. **Species composition and relative dominance of reservoir phytoplankton in Sri Lanka: Indicators of environmental quality.** *International Journal of Biological Science and Engineering* 4(4):92-102.

## Conference Proceedings

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Abeywickrama, T., **Etige, N. S.**, Randombage, A. G., Abeygunawardana, A. P., & Gunathilaka, I. T., 2024, February. **Influence of Indian Ocean Dipole on Coastal Primary Production in Sri Lanka: A 25-Year Analysis.** in Ocean Sciences Meeting 2024. AGU.

**Etige, N.S.**, Deppenmeier A.L & Anderson, B.T. 2023. **The Relationship between Kuroshio Extension, the Pacific Decadal Precession, and Marine Heatwaves in a High-Resolution Global Climate Model** in Graduate Climate Conference 2023. Marine Biological Laboratory, Woods Hole, MA.

**Etige, N.S.**, Deppenmeier A.L & Anderson, B.T. 2023. **Influence of Large-scale Kuroshio Extension Variability on the Pacific Decadal Precession in the High-Resolution Version of the Community Earth System Model** in 2023 NCAR|UCAR|UCP Summer Student Poster Research Symposium. National Center for Atmospheric Research, Boulder, CO.

**Etige, N.S.** & Anderson, B. 2022, February. **A Link between Kuroshio Extension Variations, Northeast Pacific Marine Heatwaves, and Marine Ecosystems in the Gulf of Alaska** in AGU Fall Meeting 2022. AGU.

**Silva, E.N.S.** & Anderson, B.T. 2022, March. **Influence of Kuroshio Extension Variations on the Formation of Marine Heatwaves in the Gulf of Alaska** in Ocean Science Meeting 2022. AGU.

**Etige, N.S.** & Anderson, B. 2020, February. **What Scale of Kuroshio Extension Variability Influences the Downstream Atmosphere that Links with the Pacific Decadal Precession?** in AGU Fall Meeting 2021. AGU.

Silver, A., Gangopadhyay, A., **Etige, N.S.**, Gawarkiewicz, G., Bisagni, J.J., Monim, M. and Clark, J., 2020, February. **A Census of Gulf Stream Warm and Cold Core Rings (1980-2017).** in Ocean Sciences Meeting 2020. AGU.

**Silva E.N.S.**, Rajasuriya A. and Sosai S. 2017. **Testing attitudes of fishers towards conservation; a snapshot.** Proceedings of third national symposium on marine environment; 10/17/2017; Colombo, Sri Lanka. Sri Lanka: Marine Environment Protection Authority, Sri Lanka. 37-38 p.

**Silva E.N.S.**, Liyanage N.P.P. and Jayamanne S.C. 2016. **Possible effects of climate change driven sea level rise on small islet complex of Negombo lagoon sea entrance with respect to mangrove floral community and fisheries.** Proceedings of 6th research symposium of Uva Wellassa University - Towards emerging trends in value addition; 01/28/2016 - 01/28/2016; Uva Wellassa University. Sri Lanka: Uva Wellassa University. 131 p.

**Silva E.N.S.**, Liyanage N.P.P., Jayamanne S.C. and Silva E.I.L. 2016. **The fate of Negombo lagoon sea entrance in the face of climate change driven sea-level rise.** International workshop on climate change and anthropogenic activities: Impact on coastal development and management; 10/28/2016-10/29/016; Colombo, Sri Lanka. Sri Lanka: University of Colombo. 61-63 p.

Silva E.I.L. and **Silva E.N.S.** 2016. **Mini-hydro, an injurious novel threat to highland forest ecosystems of Sri Lanka.** Proceedings of international research symposium on valuation of forest ecosystems and their services; 10/18/2016; Colombo, Sri Lanka. Sri Lanka: UN-REDD. 47 p.

Silva E.I.L., Jayawardhana R.A.S.N., **Silva E.N.S.** and Liyanage N.P.P. 2016. **The effects of escalating small hydropower development on hill stream fish fauna endemic to Sri Lanka.** Asia 2016 - International conference on water resources and hydropower development in Asia; 03/01/2016-03/03/206; Vientiane, Laos.

Silva E.I.L., Jayawardhana R.A.S.N., Liyanage N.P.P. and **Silva E.N.S.** 2015. **Effects of construction and operation of mini hydropower plants on fish fauna endemic to Sri Lanka - A case study on Kelani river basin.** Symposium proceedings of the water professionals' day - Water resources research in Sri Lanka; 10/01/2015; Post Graduate Institute of Agriculture, University of Peradeniya. Sri Lanka: Geo-Informatics Society of Sri Lanka. 45-55 p.

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## Books

Silva E.I.L. and **Silva E.N.S.** 2016. **Handbook on small hydropower development and environment: A case study on Sri Lanka.** 1st ed. Colombo, Sri Lanka: Water Resources Science and Technology.

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## Reports

Sood A., Muthuwatta L., **Silva N.S.**, McCartney M. 2017. **Understanding the hydrological impacts of climate change in the Tana river basin, Kenya.** Colombo Sri Lanka: International Water Management Institute (IWMI). Report IWMI Working Paper 178. 40 p.

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## Magazine Articles

**Silva E.N.S.**, Liyanage N.P.P., Jayamanne S.C. 2016. **Negombo lagoon sea entrance - vulnerable to climate change?** Neela Haritha - the Climate Change Magazine of Sri Lanka 1:52-53.

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## Invited Talks

**"The Kuroshio Extension, Pacific Decadal Precession, & Marine Heatwaves in the Northeast Pacific: Exploring Teleconnections and Consequences"** Invited talk for DEOS Seminar at University of Massachusetts Dartmouth's School for Marine Science & Technology, New Bedford, Massachusetts. Sep 20, 2023.

**"The Kuroshio Extension, Pacific Decadal Precession, & Marine Heatwaves in the Northeast Pacific: Exploring Teleconnections and Consequences"** Invited job talk, AER – Verisk, Lexington, Massachusetts. Sep 14, 2023

**"Kuroshio Extension's Role on Influencing Downstream Atmosphere & the Northeast Pacific Marine Environment"** Invited talk for a graduate course at University of Massachusetts Dartmouth's School for Marine Science & Technology, New Bedford, Massachusetts. Sep 22, 2022.

**"Climate Change: Livestock and Fisheries & Aquaculture Sector Vulnerability and Adaptation"** Online Workshop Resource Person. Department of Animal Science, Uva Wellassa University, Sri Lanka. Dec 09, 2021.

**"Ocean Currents and Ocean Pollution"** World Ocean Day Webinar: Panelist, Aqua Club of Uva Wellassa University, Sri Lanka. Jun 08, 2021.

**"MV X-Press Pearl: Beyond the Disaster"** Sri Lankan Twitter Space Discussion: Invited speaker. Jun 04, 2021.

**"Thirty-eight Years of Gulf Stream's Warm Core Rings: Variability, Regimes, and Survival"** Shelf and Slope Processes Informal Series, Woods Hole Oceanographic Institute, Woods Hole MA. Jul 17, 2019.

## Awards

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<b>NCAR Earth System Science Internship</b> <i>National Center for Atmospheric Research, Boulder, CO</i>	<b>Summer 2023</b>
<b>Warren McLeod Summer Fellowship in Marine Science</b> <i>Boston University Marine Program</i>	<b>Summer 2022</b>
<b>Graduate Summer Fellow</b> <i>The Frederick S. Pardee Center for the Study of the Longer-Range Future – Boston University</i>	<b>Summer 2021</b>

## Reviewer

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<b>Journal of Geophysical Research: Oceans</b>	<b>2021</b>
<b>Natural Hazards and Earth System Sciences</b>	<b>2024</b>
<b>Journal of Geophysical Research: Atmospheres</b>	<b>2024</b>
<b>Heliyon</b>	<b>2024</b>

## Work Experience

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<b>Senior Research Associate I</b> <i>Atmospheric and Environmental Inc., Verisk Analytics</i>	<b>Nov 2023 – Present</b>
<b>Senior / Teaching Fellow</b> <i>Department of Earth and Environment, Boston University</i>	<b>Sep 2019 – Nov 2023</b>
<b>Graduate Research Assistant</b> <i>Oceanographic Modeling and Analysis Laboratory, Department of Estuarine and Ocean Science, School for Marine Science and Technology, University of Massachusetts Dartmouth</i>	<b>Jan 2018 – Aug 2019</b>
<b>Intern / Consultant</b> <i>International Union for Conservation of Nature (IUCN), Sri Lanka Office</i>	<b>Jan 2017 – Aug 2017</b>
<b>Intern</b> <i>International Water Management Institute (IWMI), Sri Lanka</i>	<b>Oct 2015- Dec 2016</b>

## Technical Skills

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- High Performance Computing:
  - Boston University Shared Computing Cluster
  - NCAR High Performing Computer
- Climate Model Intercomparison Project (CMIP) data processing and analysis
- Programming languages: MATLAB, Python, R.
- Software packages: SPSS, Minitab, ArcGIS, QGIS, LaTeX.
- Languages: English (fluent), Sinhala (fluent), Tamil (basic)

## Workshops, Training, and Conferences

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**Graduate Climate Conference 2023**, Woods Hole, MA. Nov 02 – Nov 04, 2023.

**NCAR|UCAR|UCP Summer Student Poster Research Symposium**, National Center for Atmospheric Research, Boulder, CO. Aug 03, 2023.

**AGU Fall Meeting 2022**, Chicago, IL. Dec 12 – Dec 16, 2021.

**Ocean Science Meeting 2022**, Online, Feb 24 – Mar 4, 2022.

**AGU Fall Meeting 2021**, New Orleans, LA. Dec 13 – Dec 17, 2021.

**UMass Intercampus Marine Science Research Symposium**, School for Marine Science and Technology, UMass Dartmouth, New Bedford MA. Apr 04, 2019.

**NOAA Coast Watch East Coast Satellite Data Training Class**, University of Rhode Island, Narragansett Bay Campus, Narragansett RI. Jul 30 - Aug 1, 2018.

**International Workshop on Climate Change and Anthropogenic Activities: Impact on Coastal Development and Management**, Colombo, Sri Lanka. Oct 28, 2016.

**International Research Symposium on Valuation of Forest Ecosystems and their Services**, Colombo, Sri Lanka. Oct 18, 2016.

**Awareness Program on Hill-stream Landscape of Sri Lanka**, Post Graduate Institute of Agriculture, University of Peradeniya, Sri Lanka. May 27, 2016.

**Two-day Training Workshop on "Stream Ecology & Environmental Flow**, Kotmale International Training Institute, Sri Lanka. Mar 9 - Mar 10, 2016.

**6th Research Symposium of Uva Wellassa University: Towards Emerging Trends in Value Addition; Environmental Science Track**, Uva Wellasa University, Sri Lanka. Jan 28, 2016.

**Aqua Forum 2015: Blue Revolution; Challenging New Frontiers through Value Addition**, Uva Wellassa University, Sri Lanka. Dec 11, 2015.

**Seminar on Length Based Spawning Potential - A new approach to assess and manage data poor fisheries**, National Aquatic Resources Research & Development Agency, Sri Lanka. Aug 11, 2015.

**SLAFAR Pre-symposium workshop on Monitoring Water Quality for Safe Drinking Water**, University of Kelaniya, Sri Lanka. May 16, 2015.

### **Services and Other Experience**

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#### **Mentorship**

Scholar-X Mentor for three Sri Lankan Undergraduate students **2023**

Mentor for two Sri Lankan Schoolteachers on conducting research **2023**

#### **Memberships**

*BU Earth and Environment Diversity, Equity, and Inclusion Steering Committee* **2020 - 2021**

*BU Earth and Environment International Student Committee* **2020 - 2022**

*American Geophysical Union* **2018 – Present**

*The Oceanography Society* **2019 - Present**

<b>Student Representative</b> <i>SMAST Graduate Student Association</i> <i>Facilitator to conduct science demonstrations to Massachusetts middle school students</i>	<b>May 2018 – May 2019</b>
<b>Grantee Representative</b> <i>“Escalating Small Hydropower Development and Aquatic Biodiversity of Mountain Streams in Sri Lanka”, a grant awarded by Asia Pacific Network for Global Change Research</i>	<b>July 2015 – July 2016</b>
<b>Coordinator and Translator</b> <i>For an international student group from Johns Hopkins University, USA for a one week during a case study conducted in Negombo Lagoon</i>	<b>January 2016</b>
<b>Founder President</b> <i>Aqua Club of Uva Wellassa University, Sri Lanka</i>	<b>2013-2014</b>
<b>Faculty Board Student Representative</b> <i>Faculty of Animal Science and Export Agriculture, Uva Wellassa University, Sri Lanka</i>	<b>2013-2014</b>
<b>Degree Program Student Representative</b> <i>Aquatic Resources Technology Degree Program, Uva Wellassa University, Sri Lanka</i>	<b>2013-2014</b>
<b>Managing Director (Volunteer)</b> <i>Water Resources Science and Technology, a Sri Lankan organization conducting research and dissemination activities on water resources of Sri Lanka</i>	<b>January 2013 – Present</b>

## References

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### **Bruce Anderson, Professor**

Department of Earth and Environment  
Boston University  
(617) 353-4807, [brucea@bu.edu](mailto:brucea@bu.edu)

### **Avijit Gangopadhyay, Professor of Oceanography (Emeritus)**

School for Marine Science and Technology  
University of Massachusetts Dartmouth  
(508) 910-6330, [avijit.gangopadhyay@umassd.edu](mailto:avijit.gangopadhyay@umassd.edu)

### **Glen Gawarkiewicz, Senior Scientist**

Physical Oceanography  
Woods Hole Oceanographic Institution  
(508) 289-2913, [ggawarkiewicz@whoi.edu](mailto:ggawarkiewicz@whoi.edu)