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Scientist-E and Section In-charge

Polar Remote Sensing Division,
ESSO-National Centre for Antarctic and Ocean Research,
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Area of Research

- Satellite applications to sea ice, ocean color, interferometry for glacier velocity, cryospheric surface classification using GIS
- Satellite, *in-situ* data and numerical modeling to study high-latitude Ocean Oceanography

Membership

American Geophysical Union | Oceanographic Society of Japan | National Environmental Science Academy, India | Indian Society of Remote Sensing

Academic Qualifications

- 1983–1988: B. Sc., Bombay University, India
- 1988–1990: M. Sc. (Marine Sciences), Goa University, India.
- 1994–1996: M. Sc. (Marine Sciences), University of the Ryukyus, Japan.
- 1996–1997: Japanese language course and preparation for Ph. D.
- 1997–2000: Ph.D. (Geophysics with Remote Sensing), Tohoku Univ., Japan.
- 2000–2003: Post-doctorate Researcher, Tohoku University, Japan.

Professional experience

July 2015 ~ continuing	Scientist-E & Section In-charge, Polar Remote Sensing Division, ESSO-National Centre for Antarctic and Ocean Research, Ministry of Earth Sciences, Govt. of India, Headland Sada, Goa 403804. Research: Satellite applications to polar sea ice dynamics, southern ocean oceanography, interferometry of glacier surface
July 2010-June2015	Scientist-D & HOD, Polar Remote Sensing Division, ESSO-National Centre for Antarctic and Ocean Research, Ministry of Earth Sciences, Govt. of India, Headland Sada, Goa 403804. Research: Satellite applications to polar sea ice dynamics, southern ocean oceanography, Digital Elevation Modeling of ice sheets.
May 2006-May2010	Scientist-C & HOD, Polar Remote Sensing Division, ESSO-National Centre for Antarctic and Ocean Research, Ministry of Earth Sciences, Govt. of India, Headland Sada, Goa 403804. Research: Satellite data applications to Southern Ocean oceanography.
May 2003-May2006	Scientist-C (Project mode), Polar Remote Sensing Division, ESSO-National Centre for Antarctic and Ocean Research, Ministry of Earth Sciences, Govt. of India, Headland Sada, Goa 403804 Research: Satellite data applications to Southern Ocean oceanography
Apr. 2000~Mar. 2003	Post-doctorate researcher, Center for Atmospheric and Oceanic Studies, Tohoku University, Sendai 980-8578, Japan.

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Sep.1996~Mar 1997	Research student, Department of Physics and Earth Science, University of the Ryukyus, Okinawa 903-01, Japan. Research: Air-borne infrared radiometric observations of urban discrete surfaces.
Nov.1990~July 1994	Project Scientist, Physical Oceanography Division, CSIR-National Institute of Oceanography, Dona Paula, Goa 403004, India. Research: Indian component of the international **TOGA** project

Peer reviewed Publications

1. **A. J. Luis** and V. Lotlikar (2017). Hydrographic Characteristics of a Coastal Antarctic Transect in the Indian Ocean Sector, *Proc Indian National Sci Acad*. thematic Issue, May 2017.
2. Jawak, S.D., Jadhav, A., and **Luis, A. J.** (2016). Object-oriented feature extraction approach for mapping supraglacial debris in Schirmacher Oasis using very high-resolution satellite data. Proc. SPIE 9877, Land Surface and Cryosphere Remote Sensing III, 98772L, doi:10.1117/12.2223012. (Publisher: SPIE)
3. Jawak, S.D., Panditrao, S.N., and **Luis, A. J.** (2016). C-band RISAT-1 imagery for geospatial mapping of cryospheric surface features in the Antarctic environment. SPIE Asia-Pacific Remote Sensing 2016, New Delhi, 4-7 April 2016. Proc. SPIE 9881, Earth Observing Missions and Sensors: Development, Implementation, and Characterization IV, 98811R, doi:10.1117/12.2222782. (Publisher: SPIE).
4. Jawak, S.D., Udhayaraj A. D., and **Luis, A. J.** (2016). Geospatial mapping of vegetation in the Antarctic environment using very high resolution WorldView-2 imagery. SPIE Asia-Pacific Remote Sensing 2016, New Delhi, 4-7 April 2016. Proc. SPIE 9877, Land Surface and Cryosphere Remote Sensing III, 98772N, doi:10.1117/12.2222751. (Publisher: SPIE).
5. Jawak, S.D., and **Luis, A. J.** (2016). Generation of a precise DEM by interactive synthesis of multi-temporal elevation datasets: A case study of Schirmacher oasis, East Antarctica. SPIE Asia-Pacific Remote Sensing 2016, New Delhi, 4-7 April 2016. Proc. SPIE 9877, Land Surface and Cryosphere Remote Sensing III, 98772E, doi:10.1117/12.2223609. (Publisher: SPIE).
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7. Jawak, S.D., and **Luis, A. J.** (2016). Geospatial mapping of Antarctic coastal oasis using geographic object-based image analysis and high resolution satellite imagery. SPIE Asia-Pacific Remote Sensing 2016, New Delhi, 4-7 April2016, Proc. SPIE 9880, Multispectral, Hyperspectral, and Ultraspectral Remote Sensing Technology, Techniques and Applications VI, 98801Q, doi:10.1117/12.2222767. (Publisher: SPIE)
8. Jawak, S.D., Yogesh Palanivel, V., and **Luis, A. J.** (2016). Semi-automatic extraction of supra-glacial features using fuzzy logic approach for object-oriented classification on WorldView-2 imagery. SPIE Asia-Pacific Remote Sensing 2016, New Delhi, 4-7 April 2016. Proc. SPIE 9880, Multispectral, Hyperspectral, and Ultraspectral Remote Sensing Technology, Techniques and Applications VI, 98801S, doi:10.1117/12.2223024. (Publisher: SPIE).

9. Jawak, S.D., and **Luis, A. J.** (2016). High resolution multispectral satellite imagery for extracting bathymetric information of Antarctic shallow lakes. SPIE Asia-Pacific Remote Sensing 2016, New Delhi, 4-7 April 2016, Proc. SPIE 9878, Remote Sensing of the Oceans and Inland Waters: Techniques, Applications, and Challenges, 987819, doi:10.1117/12.2222769. (Publisher: SPIE)

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11. Khopkar, P.S., Jawak, S.D., **Luis, A. J**., Multisource classification and pattern recognition methods for polar geospatial information extraction using WorldView-2 data. SPIE Asia-Pacific Remote Sensing 2016, New Delhi, 4-7 April 2016. Proc. SPIE 9880, Multispectral, Hyperspectral, and Ultraspectral Remote Sensing Technology, Techniques and Applications VI, 98801R, doi:10.1117/12.2222984. (Publisher: SPIE).

12. Jawak, S. D., and **Luis, A. J.** (2015). Spectral information analysis for the semiautomatic derivation of shallow lake bathymetry using high-resolution multispectral imagery: A case study of Antarctic coastal oasis, International Conference on Water Resources, Coastal And Ocean Engineering (ICWRCOE 2015), Aquatic Procedia 4, 1331-1338**.** DOI**:**10.1016/j.aqpro.2015.02.173 (Publisher: Elsevier)

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19. S. D. Jawak, and **A J. Luis** (2015). A rapid extraction of water body features from Antarctic coastal oasis using very high-resolution satellite remote sensing data, *Aquatic Procedia*, 4, 125-132.

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21. S. D. Jawak, Devliyal, P., and **A.J. Luis** (2015). A comprehensive review on pixel oriented and object oriented methods for information extraction from remotely sensed satellite images with a special emphasis on cryospheric applications. *Advances in Remote Sensing*, Vol.4, No.3, pp. 177-19. DOI: 10.4236/ars.2015.43015.

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28. S. D. Jawak, **A.J. Luis,** Panditrao, S.N., Khopkar, P.S., and Jadhav, P.S. (2013). Advancement in land cover classification using very high resolution remotely sensed 8-band WorldView-2 satellite data. *International Journal of Earth Sciences and Engineering*, ISSN 0974-5904, Vol. 06, No. 06(02), pp. 1742-1749.

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44. **A. J. Luis** and P. C. Pandey (2005). Characteristics of atmospheric divergence and convergence in the Indian Ocean inferred from scatterometer winds, *Remote Sensing of Environment*, 97(2), 231-237.

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48. **A. J. Luis** and H. Kawamura (2004). Air-sea interaction, coastal circulation and biological production in the eastern Arabian Sea: a review. *Journal of Oceanography*, vol. 60, 205-218.

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51. **A. J. Luis** and H. Kawamura (2002), Dynamics and mechanism for sea surface cooling near the Indian tip during 1997 winter monsoon, ***Journal of Geophysical Research,*** 107, 3187, DOI: 10.1029/2000JC000455, 8-1 to13.

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53. Tang, D. L., H. Kawamura and **A. J. Luis** (2001). Short-term variability of phytoplankton blooms associated with a cold eddy in the northwestern Arabian Sea. ***Remote Sensing of Environment,*** 81, 1-8.

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55. **A. J. Luis** and H. Kawamura (2000). Wintertime Wind Forcing and sea surface cooling near the south Indian tip observed using NSCAT and AVHRR, ***Remote Sensing of Environment***, 73, 55-64.

56. V.S.N. Murty, M.S.S. Sarma, B.P. Lambata, V.V. Gopalakrishna, S.M. Pednekar, A.S. Rao, **A. J. Luis**, A.R. Kaka and L.V.G. Rao (2000). Seasonal variability of the upper-layer geostrophic transport in the tropical Indian Ocean during 1992-1996 along TOGA-I XBT tracklines (2000), ***Deep-Sea Research*** part I, 47, 1569-1582.

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59. V. V. Gopalakrishna, M. S. S Sarma, V. S. N. Murty, **A. J. Luis**, A. M. Almeida and A. A. Bhandiye. A comparitive study on the performance of ECIL XBT with Sippican XBT and CTD data, **NIO Technical Report: NIO/TR-16/92**, Nov. 1992.

Papers presented at Conferences/Seminars

1. Jawak, S.D., **Luis, A. J.** (2016). A comprehensive review on geospatial applications to life sciences, Proceedings of National seminar on "Advances in life sciences in Botany", St. Xavier's college (Goa University), Goa, India, 07-08 December 2015. ISBN:978-93-84298-49-4.
2. Jawak, S.D., and **A. J. Luis** (2015). Very high resolution satellite imagery for cryospheric geospatial and geoscientific information extraction, XII International Symposium on Antarctic Earth Science (ISAES 2015), Abstract No. S22-5, pp. 479, Goa, India, July 13-17, 2015. DOI: 10.13140/RG.2.1.2275.6960.
3. Jawak, S. D., and **Luis, A. J.** (2014). Synergetic merging of Cartosat-1 and RAMP to generate improved digital elevation model of Schirmacher Oasis, east Antarctica, The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, Volume XL-8, 2014, ISPRS Technical Commission VIII Symposium, 09 – 12 December 2014, pp. 517-524, Hyderabad, India. DOI:10.5194/isprsarchives-XL-8-517-2014. (Publisher: ISPRS)
4. Jawak, S. D., Panditrao, S. N., **Luis, A. J.** (2014). Airborne LiDAR and high resolution satellite data for rapid 3D feature extraction, The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, Volume XL-8, 2014, ISPRS Technical Commission VIII Symposium, 09 – 12 December 2014, pp. 573-580, Hyderabad, India. DOI:10.5194/isprsarchives-XL-8-573-2014.
5. Jawak, S. D., Panditrao, S. N., **Luis, A. J.** (2014). Enhanced urban landcover classification for operational change detection study using very high resolution remote sensing data. The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, Volume XL-8, 2014, ISPRS Technical Commission VIII Symposium, 09 – 12 December 2014, pp. 773-779, Hyderabad, India. DOI:10.5194/isprsarchives-XL-8-773-2014. (Publisher: ISPRS)
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7. Jawak, S.D., Panditrao, S.N., and **Luis, A. J.** (2013). Quantitative Evaluation of Feature Detection Capability of Airborne LiDAR using very-high resolution WorldView-2 Satellite Data, Proceedings of AGSE international conference, 16-19 December, CEPT University, Ahmedabad, India**,** pp. 378-384, ISBN 978-3-943321-12-8**.** DOI: 10.13140/RG.2.1.4733.2963. (Publisher: AGSE, Germany**)**
8. Jawak, S.D., and **Luis, A. J.** (2015). Interactive synthesis of photogrammetry, laser altimetry, and radar altimetry to generate precise DEMs in Antarctic environment, *XII International Symposium on Antarctic Earth Science (ISAES 2015),* Abstract No. S22-6, pp. 480, Goa, India, July 13-17, 2015. DOI: 10.13140/RG.2.1.4634.9920.
9. Jawak, S.D., Sharma, N., and **Luis, A. J.** (2015). Precise DEM of Schirmacher oasis by synergistically fusing multitemporal elevation datasets, *XII International Symposium on Antarctic Earth Science (ISAES 2015),* Abstract No. S22-11, pp. 485, Goa, India, July 13-17, 2015. DOI: 10.13140/RG.2.1.3586.4164.
10. Jawak, S.D., Kulkarni, K., and **Luis, A. J.** (2015). Explorative normalized difference water index as an innovative tool for semiautomated extraction of Antarctic lakes, *XII International Symposium on*

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Sea going and data sampling experience

1. Member of IX Indian Arctic Expedition (2015) (1 month at Svalbard, Arctic, doing field measurements on different glaciers on foot, 5 km away from base station)
2. Member of XXVI Indian Scientific Expedition to Antarctica: sailed on board M. V. Emerald Sea from 10th January to 6th April 2007 from Goa – Mauritius- Durban - Maitri – Larsemann Hills – Goa: (**3 months**).
3. Participated in TOGA XBT and meteorological data collection campaign on board ships-of-opportunity plying between Madras-Port Blair- Calcutta (1990-1994): **40 days**
4. Participated in TOGA XBT and meteorological data collection between Bombay-Colombo, Bombay-Mauritius-Bombay, Bombay-Seychelles- Bombay shipping routes onboard cargo vessels (1990-1994): **50 days**
5. Participated in ORV Sagar Kanya cruise to carry out CTD observations for studies relating to barrier layer at the head Bay of Bengal during southwest monsoon of 1991: **45 days**
6. Participated in deep-sea mooring of current of current meters in Pacific during 1999 on board Japanese research vessel Hakuo Maru: **20 days**
7. Participated in post-tsunami impact studies aimed at measuring temperature and salinity using Seabird CTD, in addition to turbidity, columnar zooplankton biomass, sediment traps and deep-sea corer for geological sampling in the Andaman Basin and along the Andaman & Nicobar Islands onboard Sagar Kanya: **37 days**