Dr. Anoop Kumar Tiwari - a brief Bio sketch



Dr. Anoop Kumar Tiwari is a Scientist F at ESSO-National Centre for Polar and Ocean Research (NCPOR) in Goa with over 27 years of experience. His expertise lies in **Environmental Impact Assessment and monitoring** of activities in the Polar region. He has developed Comprehensive Environmental Evaluation Reports for the

Indian research station Bharati and conducted studies on chemical contamination (Persistent Organic Pollutants, mercury, heavy metals, etc.) and aerosols. Prior to this role, he worked at the National Environmental Engineering Research Institute (NEERI) in Nagpur for over five years, where he worked on Capacity Projects and Environmental Impact Assessment (EIA) Studies for various industries such as Cement, Thermal Power Plant, Steel, Fertilizer, and Hydrocarbon industries. Dr. Tiwari has also played a significant role in developing the Indian Antarctic Act, 2022, and the Indian Antarctic Environmental Protection Rules, 2023 as a member secretary of the National Drafting Committee on Legislation. He has been actively involved in implementing the provisions of the Acts and Rules in the Indian Antarctic Programme.

He holds a Bachelor of Engineering in Civil Engineering, followed by a Master of Engineering in Environmental Engineering, and completed his **PhD in Marine Science** from Goa University.

He is a **recognised PhD guide** for Goa University and Savitri Bai Phule, Pune University in Marine Science (Chemistry) and Environmental Science.

He represents India in the Committee for Environmental Protection (CEP) at the Antarctica Treaty Consultative Meeting (ATCM) as well as elected as Leader of the Environmental Expert Group (EEG) (2015-2020) of the Council of Managers of the National Antarctic Programme (COMNAP). Dr Tiwari is Vice-Chair of CEP, elected consecutively for a second term from 2023-2025. He also Chaired (acting) the 26th Committee for Environmental Protection meeting hosted by the Ministry of Earth Sciences (MoES) and the National Centre for Polar and Ocean Research (NCPOR) at Kochi in May 2024.

Dr. Tiwari has been deputed to participate and represent India in **18** Antarctica Treaty Consultative Meeting (ATCM) and CEP, **four** CCAMLR, and **ten** COMNAP meetings. He is also part of a delegation to the Commission for Conservation of Antarctic Marine Living Resources and once in the Scientific Committee on Antarctica Research (SCAR). He is **currently representing** India as a member of the **SCAR-ImPACT** group to study the effect of Persistent Organic Pollutants in Antarctica.

He participated in **eight** Indian Scientific Expeditions to Antarctica under an environmental impact assessment study from (1999-2015) and once in the Indian Arctic Expedition in the year 2019 to carry out research work on mercury and Persistent Organic Pollutants.

Dr. Tiwari research work includes, environmental quality at Maitri station, invasive alien species, bio-prospecting, the effect of glacier melting at Priyadarshini Lake, and assessment of mercury and persistent organic pollutants (POP) in the polar region. He was instrumental in basic design requirements and preparation of the Comprehensive Environmental Impact Assessment of India's third research station, "Bharati", and getting it cleared through the Committee for Environmental Protection (CEP) associated with Antarctica Treaty Consultative Meetings (ATCM).

He has received the Shrimati Shiromadevi Prize (2008) for the paper 'Water Abundance and Effect of Glacier Melting at Priyadarshini Lake in Antarctica', in the Environmental Engineering Journals of the Institutions of Engineers. He also won 'The **Rekha Nandi and Bhupesh Nandi Prize'** (2009) for the paper 'Wastewater fate at Maitri in Antarctica, Journal of the Institution of Engineers (Environmental Engineering).

He is also a member of The Indian Science Congress Association, National Environmental Science Academy and Indian Aerosol Science and Technology Association. Dr. Tiwari has contributed more than **30 research papers** in various national and international journals as a lead author as well as one of the authrors.

Publications

Peer-Reviewed Journal (National and International)

José C. Xavier, and many authors, Anoop K. Tiwari, Sophie Weeks, Kevin A. Hughes (2024).
 Education and Outreach Activities by the Antarctic Treaty Parties: Topics and target audiences submitted to Journal of Science Education.

- M, B.Binish., Tiwari, A.K., N, S.Magesh., Mohan, M. & C, M.Laluraj (2024). Source apportionment of major ions and trace metals in the lacustrine systems of Schirmacher Hills, East Antarctica. Sci Total Environ, 946, 174189, http://doi.org/10.1016/j.scitotenv.2024.174189.
- Vudumala,K., Chakraborty,P., Chatragadda,R., Tiwari A.K. (2023). Distribution of organochloride pesticides in surface and deep waters of the Southern Indian Ocean and coastal Antarctic waters. Environmental Pollution 321, 121206. https://doi.org/10.1016/j.envpol.2023.121206
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- 6. Kangane, J., Nayak, G.N., **Tiwari, A.K**., and Saalim, S.M. (2021). Changing the paleodepositional environment in the last 2300 years: a study through sedimentology and geochemistry of a sediment core, western Bay of Bengal. Environmental Earth Sciences 80.
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- 8. Nasnodkar, M.R., Nayak, G.N., Bhangle, P.P., and **Tiwari, A.K**. (2021). Spring-neap tides influence on bioavailability of metals and bioaccumulation in edible biota of the Zuari (tropical) Estuary. Environmental Monitoring and Assessment 193.
- 9. Botsa, S.M., Raju, M.P., **Tiwari, A.K**., Magesh, N.S., and Leitao, T.D.L. (2021). Potential source areas identification for dynamics of long-range transport of black carbon aerosols to Maitri station, East Antarctica. Environmental Science: Atmospheres the Royal Society of Chemistry.
- 10. Cruz, T.C., Nayak, G.N., **Tiwari, A.K**., and Nasnodkar, M.R. (2020). Assessment of metal pollution and bioaccumulation of metals by edible bivalve Polymesoda erosa in the Zuari Estuary, west coast of India. Marine Pollution Bulletin 158.
- Das, K.R., Tiwari, A.K., and Kerkar, S. (2020). Psychrotolerant Antarctic bacteria biosynthesize gold nanoparticles active against sulphate reducing bacteria. Prep Biochem Biotechnol 50: 438-444.
- Magesh, N.S., Botsa, S.M., Dessai, S., Mestry, M., Leitao, T.D.L., and Tiwari, A. (2020). Hydrogeochemistry of the deglaciated lacustrine systems in Antarctica: Potential impact of marine aerosols and rock-water interactions. Sci Total Environ 706: 135822.
- 13. Subhavana, K.L., Qureshi, A., Chakraborty, P., and **Tiwari, A.K**. (2019). Mercury and Organochlorines in the Terrestrial Environment of Schirmacher Hills, Antarctica. Bull Environ Contam Toxicol 102: 13-18.
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- 16. Choudhary, S., G. N. Nayak, **A. K. Tiwari**, and N. Khare (2018). Source, processes and productivity from distribution of surface sediments, Prydz Bay, East Antarctica, Polar Sci, doi:10.1016/j.polar.2018.06.002.
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- 23. Chaubey, J. P., K. K. Moorthy, S. S. Babu, V. S. Nair, and **A. Tiwari** (2010). Black carbon aerosols over coastal Antarctica and its scavenging by snow during the Southern Hemispheric summer, Journal of Geophysical Research, 115(D10), doi:10.1029/2009jd013381.
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- 26. **Tiwari, A. K**., and G. N. Nayak (2007). Water Abundance and Effect of Glacier Melting at Priyadarshini Lake in Antarctica, Journal of Institution of Engineers India (Environmental Engineering), 88(EN1), 27-32.
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- 7. **Tiwari, A. K.**, R. Ravindra, S. Rajan, N. Khare, and A. Saxena (2007). Draft Comprehensive Environmental Evaluation of New Indian Research Base at Larsemann Hills, AntarcticaRep., New Delhi.
- 8. **Tiwari, A.K.,** and Kulkarni, S. (2005). Environmental Status at Indian Polar Research Station Maitri - A Comprehensive Study. In Scientific Report: Nineteenth Indian Expedition to Antarctica. Chaturvedi, A. (ed). National Institute of Science Communication and Information Resources, CSIR, New Delhi, India.

Book

1. Khare, N, **Tiwari, A.K**., Leitao, T.M.D.L. (2023). Antarctica: Environment and Conservation (Arising Issues Policy and Management), Khare N., (ed). Scientific Publisher, India, ISBN-10 : 9392590830

Book Chapters

- Tiwari, A.K., and Leitao, T.M.D.L.(2022). Role of Persistent Organic Pollutants and Mercury in the Arctic Environment and Indirect Impact on Climate Change. In Climate Change in the Arctic. Khare, N. (ed): CRC Press, Taylor and Francis Group, London, pp. 93-136. D.O.I:10.1201/9781003265177-7
- Tiwari, A.K., Leitao, T.D.L., and Khare, N. (2020). Antarctic Environmental Studies over the last 35 Years of the Indian Antarctic Expedition. In Engineering and Communication in Antarctica - Enabling Technologies in Antarctica. Khare, N. (ed). Springer Nature Pte Ltd, Singapore: Ministry of Earth Sciences, New Delhi, India, pp. 123-134.
- Tiwari, A.K., and Leitao, T.D.L. (2020). Establishment of India's Third Research Station in Antarctica—A Review. In Engineering and Communication in Antarctica - Enabling Technologies in Antarctica. Khare, N. (ed). Springer Nature, Singapore Pte. Ltd., Singapore: Ministry of Earth Sciences, New Delhi, India, pp. 177-188.
- 4. Ravindra, R., and **Tiwari , A.K**. (2011). India's Interests in the Arctic and Antarctica. In South Asia Defence and Strategic Year Book. Singh, H. (ed). New Delhi: Pentagon Security International, pp. 95-101.
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- 9. Singh, S.M., **Tiwari , A.K**., and Pandey, P.C. (2005). Biodiversity : Past Present and Future. In Biodiversity of Lonar Crater. Banmeru, P.K., Banmeru, S.K., and Mishra, V.R. (eds). Anamaya Publishers, New Delhi, India, pp. 1-16.
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Abstracts

International Conference on Polar studies – Engaging with Polar Regions, Kochi (2024)

• Binish, M.B., A. K.Tiwari, Magesh, N.S., and Mahesh M. (2024). Multi-index assessment of major and trace elements in the surface water of the lacustrine system of Schirmacher Hills, East Antarctica

The 109th Indian Science Congress under the Earth System Science Section (2024)

• **A. K. Tiwari**, M.B. Binish, E.V. Ramasamy (2024). Microplastics (MP) in the freshwater ecosystems of Antarctica: an emerging concern, Lovely Professional University (LPU), Phagwara, India.

Scientific Committee on Antarctic Research (2024), Chile

 José C. Xavier, and multi authors, Anoop K. Tiwari, Sophie Weeks, Kevin A. Hughes (2024). The Role of Education and Outreach at the Antarctic Treaty Consultative Meetings: Is Science Being Used Enough?

International Conference on Science & Geopolitics of Arctic & Antarctic, New Delhi (2019)

• **Tiwari, A.K.**, Beg, M.J., Ravichandran, M. (2019). Indian Polar Stations, Environmental Protocol and Challenge in Introduction of Treatment System and Advance Monitoring Instruments, SAGAA-2019, New Delhi, India

National Conference on Polar Sciences (2019)

- Ravindra, R., **Tiwari, A**. (2019). Liability Annex and Indian Antarctic Law, NCPS, 2019, NCPOR, Goa, India
- Tara Megan Da Lima Leitao, Kirti Ranjan Das, **Anoop Kumar Tiwari** (2019). Alien species in Antarctica, threat to Biodiversity- An Indian perspective, NCPS-2019,NCPOR, Goa, India
- Kirti Ranjan Das, Savita Kerkar, Tara Megan Da Lima, **Anoop Kumar Tiwari** (2019). Assessment of Environmental contamination with regard to Effluent Generated from Indian Antarctic station, Bharati, NCPS-2019, NCPOR,Goa, India
- Botsa, S., M., Sivan, M., N., Mestry, M., Desai, S.**Tiwari, A.K**. (2019). Assessment of Water and Air Quality at Maitri station, Schirmacher hills, NCPS, 2019, NCPOR, Goa, India
- Sivan, M.,N., Desai, S., Mestry, M., Botsa, S., M., Leitao, T.,M.,D.,L., **Tiwari, A.K**. (2019). Factors controlling the hydrogeochemistry of lakes in the Grovnes, Larsemann Hills, East Antarctica, NCPS, 2019, NCPOR, Goa, India

Society of Environmental Toxicology and Chemistry (SETAC) 2018

• **Tiwari, A.K**., Subhavana, K.L., Qureshi, A., Chakraborty, P. (2018). PCBs in the terrestrial environment of Schirmacher Hills, Antarctica: A preliminary study and implications for PCB degradation kinetics, 3–7 November 2019, 40th SETAC Meeting, Sacramento, California, USA

Scientific Committee on Antarctic Research (SCAR 2018)

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International Conference on Mercury as a Global Pollutant (ICMGP)-Mercury 2017

• Qureshi, A., **Tiwari, A.K**. (2015). Mercury Assessment at Indian Antarctic Stations in Antarctica – A Preliminary Study", 13th International Conference on Mercury as a Global Pollutant (ICMGP), USA.

National Conference on Polar Sciences (2016)

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XII-International Symposium on Antarctic Earth Sciences-2015

• Jeeva,K., **Tiwari A.K**., Behera .J.,Gurubaran,Mala Baggia, Sinha, A.K.,(2015). Physical And Chemical Coupling Between The Stratosphere And Troposphere: A Plausible Mechanism To Understand The Solar-Terrestrial Weather Relationship, SCAR, XII International Symposium on Antarctic Earth Sciences, Goa, India

International Conference on Science & Geopolitics of Arctic & Antarctic, New Delhi (2015)

• **Tiwari,A.K**. (2015). Implications of Tourism in Pursuance of Annex VI – An Environmental Perspective, SAGAA, New Delhi, India

IPY Conference, Montreal, Canada (2012)

 Chaubey, J.P., Suresh, B.S., Krishna, M.S., Tiwari, A.K., Eleftheriadis, K, Turnved, T., Maturilli, M., Vitale, V., Manoj, M. R. and Gogoi, M.M. (2012). Aerosols in the Arctic atmosphere during summer season: effect of atmospheric bondary layer, long range transport and local emissions, IPY, Canada

International Conference on Science & Geopolitics of Arctic & Antarctic, New Delhi (2012)

• Suresh, B.S., Manoj, M.R., Gogoi, M.M., **Tiwari.A.K**., Moorthy, K.K. (2012). Atmospheric Aerosol Studies Over Arctic, Initiatives for Long-term data and Preliminary Results, SAGAA, New Delhi, India

National Space Science Symposium (NSSS), Tirupati (2012)

• Choubey,J.P., Moorthy,K.K., Suresh, B.,S, Manoj M.R., Gogoi,M.M., **Tiwari,A.K**.,and Rajan,S. (2012). Summertime Black Carbon Aerosols in the Arctic Boundary Layer, NSSS, Tirupati, India

International Conference on Physics Science and Technology, Bangalore (2011)

 Suresh, B.S., Manoj, M.R., Gogoi, M.M., Tiwari.A.K., Moorthy, K.K (2011). Optical and Physical Properties of Atmospheric Aerosol over Arctic during summer 2011, ICPST, Banglore, India

Posters

National Conference on Polar Sciences (2023)

• Binish, M.B., Tiwari, A.K. (2023). Patial variability of selected water quality parameters of the lacustrine system in Schirmacher Hills, East Antarctica.

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- Tara Megan Da Lima Leitao, Kirti Ranjan Das, **Anoop Kumar Tiwari** (2019). Alien species in Antarctica, threat to Biodiversity- An Indian perspective, NCPS-2019,NCPOR, Goa, India
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- Magesh Sivan, Soniya Desai, Mamta Mestry, Sathish Mohan, Tara Megan Da Lima, **Anoop Tiwari** (2019). Factors controlling the hydrogeochemistry of lakes in the Grovnes, Larsemann Hills, East Antarctica, NCPS-2019, NCPOR, Goa, India

American Geophysical Union (AGU) Fall Meeting (2018)

 J. Bageston, A. Burrell, M. Cliverd, E. Correia, P. Cilliers, G. De Franceschi, A.M. Gulisano, M. Hernández-Pajares, G. Heygster, P. Høeg, G. Jee, A. Krankowski, C. Lee, M. Lester, J. Lichtenberger, S. Lyatsky, M.F. Marcucci, D. Di Mauro, C. Mitchell, J. Morton, T. Nakamura, M. Negusini, A. Paul, G. Petihakis, M. Pozoga, P. Prikryl, V. Romano, P.T. Jayachandran, A.K. Tiwari, A. Weatherwax, A. Zalizovski and S. Zou External contributors: L. Benoit, D. Lombardi, R. Van Malderen, F.J. Meyer, E. Pottiaux, D. Roma-Dollase and L. Spogli (2018). RESOURCE: an International Initiative for Radio Sciences Research on Antarctic Atmosphere, SM51C-2760, AGU Fall Meeting (10-14 December), 2018

Scientific Committee on Antarctica Research (SCAR), Argentina (2010)

- R. Cutting, **A.K. Tiwari**. R. Ravindra (2010). Aerosol Size Variation and Trace Gas Measurement in coastal Antarctica and Two Indian Stations
- N.Singh, A.K. Tiwari, R. Ravindra (2010). Assessment of Dissolved Mercury in Lakes of Schirmacher Oasis and Larsemann Hills: best poster presentation in SCAR

The Asia Oceania Geosciences Society (AOGS) Conference (2010)

• R. Cutting, **A.K. Tiwari**, Neelu Singh (2010).Environmental Studies in Antarctica, Hyderabad from 5-9 July 2010

Council of Managers on National Antarctic Programme (2010-12)

- Anoop Tiwari, R. Ravindra, J., Beg COMNAP (2012). Energy Conservation at India's New Research Station "Bharati, COMNAP, Portland, USA
- Anoop Tiwari, R. Ravindra (2010). Wind Energy Prospects at Indian Research Station Maitri, COMNAP, Stockholm, Sweden

Scientific Committee of Problems of the Environment, International Science Council (2005)

- **A.K.Tiwari**, S.M.Singh, P.C. Pandey (2005). Environmental Protection in Antarctica, XII-SCOPE Assembly, INSA, New Delhi
- S.M. Singh, **A.K. Tiwari**, P.C. Pandey (2005). Environmental Impact on Plants of Antarctica, XII-SCOPE Assembly, INSA, New Delhi

Popular Presentation to Society

- 1. Indian Institute of Tropical Meteorology-ENVIS, Pune (2021): Antarctic Frontiers and Ecosystem Challenges, on World Environment Day
- 2. NCPOR, Swachh Bharat Mission (2020) : Environmental Perspective and Swachch Bharat Mission
- 3. Vigyan Bhavan Goa (2007): Risk Assessment and Disaster Management at Indian Permanent Research Station "Maitri, Antarctica"

Co-Supervisor International Post-Graduation Thesis

Ms Asma Ebrahim (2024). Can an Economic-Based Approach Support the Development of Antarctica's Regulatory Framework for Bioprospecting?. University of Akureyri, Iceland

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