


Profile of Professor Harish Chandra Nainwal

Name:	Dr. Harish Chandra Nainwal			
Designation:	Professor & Dean, Earth Science			
Department:	Geology			
Campus:	Srinagar			
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Email:	nainwal61@gmail.com nainwalhc@hnbgu.ac.in			
Education Qualifications:	M. Sc. (Geology), D.Phil. (Geology)			
Teaching Experience:	~38 Years	Research Experience:	~40 Years	
Research Interest and Fields of Specialization:				
<ul style="list-style-type: none"> • Glaciology • Engineering Geology • Natural hazards 				
Honours/Awards/Recognitions:				
<ul style="list-style-type: none"> • Peer Reviewer for Science of the Total Environment (Elsevier), Current Science, Journal of Earth System Science, Geological Society of India, Journal of Quaternary International, International Journal of Applied Remote Sensing and GIS, Himalayan Geology • Member, Technical-cum-Financial Appraisal Committee (TFAC) on Environmental Research and Development Programme (ERDP), Ministry of Environment, Forest and Climate Change, GoI, New Delhi • Member, INFRA-2, Ministry of Environment, Forest and Climate Change, GoI, New Delhi • External Expert of Research Advisory Committee of Sri Guru Ram Rai University, Dehradun 2023-2026. 				

- Convener, IQAC-Task Group III-Research Innovation and Extension, HNB Garhwal University, Srinagar Garhwal, 2019-21
- Member Institutional Ethical Committee (I.E.C.) of HNB Garhwal University, Srinagar Garhwal 2023-2025
- Reviewer for the research project funded by MHRD under RUSA program to University of Rajasthan, Jaipur, October, 2019
- Regular Member, G-6 Committee: Disaster Management Committee, Indian Road Congress, New Delhi, 2018-2020 & 2020-2023
- Member, Editorial Board cum Reviewer, International Journal of Applied Remote Sensing and GIS, 2016
- Editor in Chief, Himalayan Review Journal (ISSN: 2348-4942), 2014
- Editor, Uttarakhand Year Book
- Member, Development of Ice core program for Himalayan glaciers, Indian Institute of Science, Bangalore & DST-GOI, New Delhi, 2014
- Member, Programme Advisory Committee on Himalayan Glaciology (PAC-HG), DST-GoI, New Delhi, 2012-2014
- Resource Person/Expert Trainer in the DST (GoI) Indo-Swiss Capacity Building Programme in Himalayan Glaciology organized by DST-GoI & School of Environmental Sciences, Jawaharlal Nehru University, New Delhi, 2013
- Geological consultant for road alignment / construction, Govt. of Uttarakhand, Dehradun, 2005
- JRF and SRF, Central Building Research Institute-CSIR, Roorkee, 1982 & 1985
- 1st Position in M.Sc. Geology (1982) in the order of merit of the Garhwal University, Srinagar, 1982

Member of Academic Institutions:

- Chairman, School Board of Earth Science, HNBSGU, Srinagar Garhwal, October 2023 onwards.
- Member, Executives Council, FRI Deemed University, Dehradun, 2023-2026.
- Member, Executive Council, Banaras Hindu University, Varanasi, 2018-2021
- Member, Academic Council, HNB Garhwal University, Srinagar Garhwal, 2015-18
- Convener, Board of Studies (Geology) & Head Department of Geology, HNB Garhwal University, Srinagar Garhwal, 2015-2018
- Member, Board of Studies Centre for Folk, Culture and Performing Arts, HNB Garhwal University, Srinagar Garhwal
- Campus Head, Department of Geology, HNB Garhwal University, Srinagar Garhwal February 2023 onwards.
- Member, School Board in Earth Sciences, HNB Garhwal University, Srinagar Garhwal,

2015-2018

- Member, Board of Studies, (Geology, Physics, Journalism & Mass communication, Biotechnology, Geography, Political Science), HNB Garhwal University, Srinagar Garhwal during various sessions
- Member, Executive Council, Uttarakhand Technical University, Dehradun, 2009-11
- Member, Academic Council, Uttarakhand Technical University, Dehradun, 2009-11
- Chairman of Sport Council of Uttarakhand Technical University from 2009 to 2011
- Member of Board of Studies (BOS) of Pt. LMS Govt. Autonomous College Rishikesh, 2012-14 & 2018 to Present

Involvement with formulations of academic programs:

- Formulated syllabus of B.Sc. CBCS Geology pass program of HNB Garhwal University as Chairman Board of Studies in Geology, 2015
- During various academic year, formulated M. Sc. Geology syllabus of HNB Garhwal University Srinagar as Chairman and Member of BOS Geology
- Formulated M.Sc. Geology syllabus of Doon University, Dehradun, Uttarakhand, 2018
- Formulated M.Sc. Geology syllabus of Sri Dev Suman University, New Tehri, Uttarakhand as Convener, 2018
- Formulated M.Sc. Geology syllabus of Govt. PG Degree College Rishikesh, Uttarakhand, 2020.
- Formulated UG and PG syllabus of Geology as per National Education Policy, 2020

Research guidance of students under my supervision:

1. Thesis awarded: 19
2. Student Registered for Ph.D.: 02
3. M. Sc. Dissertation: More than >100

Research Projects:17

- Understanding and modelling the interactions between Debris and glacier Ice in a changing Climate (D-ICE), An international Indo-Swiss research project funded by Ministry of Earth Science, GoI, New Delhi 2023-2027.
- Glacier studies on Raj Bank glacier under CAP Program, funded by Space Applications Centre (ISRO-GoI), Ahmedabad, 2020-2023
- The State and Fate of Himalayan glaciers in Upper Alaknanda Basin, Central Himalaya, India funded by Department of Science & Technology (SPLICE Climate Change Program), Govt. of India, New Delhi, 2019-2022
- Integrated studies of Himalayan Cryosphere using space based inputs, funded by

Space Applications Centre (ISRO-GoI), Ahmedabad, 2018-2020

- Understanding of hydrological process in Upper Ganga Basin by using Isotopic Technique funded by National Institute of Hydrology, Roorkee (Under NMSHE Mission) 2017-2022
- Estimation of ice thickness and surface velocity using GPR and DGPS on Satopanth Glacier funded by SERB-Department of Science & Technology, Govt. of India, New Delhi, 2014-2019
- Glaciers in Upper Alaknanda-Sarswati Basin and Climate Change funded by Institute of Mathematical Sciences (DoAE-GoI) Chennai, 2014-2019
- Study of Snow and glacier funded by Space Applications Centre (ISRO-GoI), Ahmedabad, 2007-2010
- Paleo-glaciation studies of upper Alaknanda catchment with special reference to pro-glacial geomorphology of Satopanth and Bhagirath Kharak glaciers funded by Department of Science & Technology, Govt. of India, New Delhi, 2005-2008
- Development of photogrammetric methods for mass balance estimation of glaciers using CARTOSAT-I stereo data funded by Space Applications Centre (ISRO), Govt. of India, Ahmedabad, 2005-2007
- Micro-zonation of slope instability using SMR approach - a case study along Rishikesh-Gangotri road (from Chinyalisaur to Uttarkashi), Bhagirathi valley, Uttarakhand Himalaya funded by G.B. Pant Institute of Himalayan Environment and Development, Kosi-Katarmal, Almora, 2003-2006
- Study of some landslides along Main Central Thrust (MCT) in Mandakini valley & their relationship with neo-tectonic activities funded by Department of Science & Technology, Govt. of India, New Delhi, 1994-1997
- Geological appraisal of landslides in a part of Alaknanda valley, Garhwal Himalaya funded by University Grant Commission, New Delhi, 1994-1995
- Geohydrology of Springs in Garhwal funded by G.B. Pant Institute of Himalayan Environment and Development, Kosi-Katarmal, Almora, 1991-1994
- Analysis of environmental degradation in Upper Alaknanda-Dhauliganga catchment, Garhwal Himalaya, with special reference to landslide, soil erosion and environmental conservation funded by Department of Environment, Govt. of Uttar Pradesh, Lucknow, 1989-1992
- Instrumentation and monitoring work at Kaliasaur landslide zone, Garhwal Himalaya funded by Central Building Research Institute (CSIR), Roorkee, 1986- 1987
- Eco-development project on Kaliasaur landslide area, Garhwal Himalaya funded by Central Building Research Institute (CSIR), Roorkee, 1985-1986

Administrative Experience:

- Dean, School of Earth Science, HNB Garhwal University, Srinagar Garhwal, since October 2023
- Coordinator, Centre for Folk, Culture and Performing Arts, HNB Garhwal University, Srinagar Garhwal, since 2022
- Chairman, Institutional Academic Integrity Panel (IAIP), HNB Garhwal University,

Srinagar Garhwal since July 2020.

- Chairman, CGHS Committee, HNB Garhwal University, Srinagar Garhwal
- Member, Institutional Ethical Committee (I.E.C.), HNB Garhwal University, Srinagar Garhwal
- Member, Ordinance Review and Amendment Committee, HNB Garhwal University, Srinagar Garhwal.
- Coordinator, Folk and Performing Arts, HNB Garhwal University, Srinagar Garhwal Since February 2022.
- Nodal Officer of the university for India Universities and Institutions Network for Disaster Risk Reduction (IUINDRR-NIDM), Ministry of Home- GoI, New Delhi.
- Head, Department of Geology, HNB Garhwal University, Srinagar Garhwal, Jan.2015 to Jan. 2018
- Worked as Coordinator, M.Phil./Ph.D. Entrance Test-2017, H.N.B. Garhwal University, Srinagar Garhwal, Uttarakhand
- Chief Election Officer of Student Union Election of Birla Campus and Apex Body of students HNB Garhwal University 2014-15.
- Member of UGC Expert Committee for the conferment of Autonomous Status of Dehradun Institute of Technology, Dehradun, 2011
- Acting Vice Chancellor/OSD, Uttarakhand Technical University, Dehradun for a period of one month (Dec. 2008)
- Pro-Vice Chancellor and Controller of Examinations, Uttarakhand Technical University, Dehradun for a period of three years from 2009 to 2011.
- Assistant Dean Student Welfare (Session 1998-1999 & 2000-01), HNB Garhwal University, Srinagar Garhwal
- Assistant Proctor of the University (Sessions 1991-92, 1993-94, 1996-97, 2002-04), HNB Garhwal University, Srinagar Garhwal

Scientific Visits/Meetings

Abroad

- Attended Joint bilateral workshop on evolution of debris covered glaciers at University of Zurich, Zurich, Switzerland, 03-12 September, 2019
- Attended 5th Third Pole Environment conference and Sino-German Workshops organized by Senckenberg Nature Research Institute and University of Tuebingen, Berlin, Germany, 8-12 December, 2014
- Attended a workshop organized by University of Nebraska, USA at ICIMOD, Kathmandu, Nepal, 31 March to 3 April, 2008

Conference/Symposium/Workshop Attended during 2014-2022:

International:

- Keynote speaker in “One Week FDP and International Workshop on New Trends in the Field of Chemistry, Environment and Education Policy’ (NTFCEP-2021) organized by Land, Air & Water Centre of Excellence, DIT University, Dehradun on 28/07/2021.
- Delivered a invited talk on Glacier Resources of Uttarakhand: A case study from Upper Alaknanda Basin in a National workshop on Mountain Geo-Hydrology, organized by Doon University on 8th August 2020.
- Delivered a invited talk in First Indian-Danish workshop on Arctic and Alpine Aquatic Science - Implications of climate change on proglacial freshwater ecosystems functioning and services organized by Department of Zoology, HNBGU Srinagar, 11 October, 2019
- Panelist on Cryosphere and water security session in international summit on Water Future-towards a sustainable water future organized by Indian Institute of Science, Bangalore, 24-25 September, 2019
- Attended Joint bilateral workshop on evolution of debris covered glaciers at University of Zurich, Zurich, Switzerland, 3-12 September, 2019
- Attended the first meeting of Upper Indus Basin Network Chapter (UIB-NC) organized by International Centre of Integrated Mountain development (ICIMOD) and co-hosted SES-JNU New Delhi at India Habitat Centre, New Delhi, 19 April, 2019.
- Invited talk in International Conference: State of the Cryosphere in the Himalaya: With a focus on Sikkim and eastern Himalayas - gaps, challenges and opportunities, Gangtok, Sikkim, 19-20 February, 2018
- Keynote speaker in Joint bilateral workshop on evolution of debris covered glaciers organized by HNB Garhwal University, Srinagar Garhwal, India, 11-13 June, 2018
- Attended the Asian Ministerial Conference on Disaster Risk Reduction (AMCDRR) hosted by National Institute of Disaster Management (Ministry of Home Affairs) Government of India, New Delhi, 2-6 November, 2016
- Keynote speaker in International conference on Global Environment change in the Himalayan region: controversies, impacts, futures organized by Heidelberg University Germany at New Delhi, 6-8 November, 2015
- Keynote speaker in International workshop on climate change and adaptation in Himalaya organized by Department of Geography, Kumaon University, Nainital, 2-3 November, 2015
- Invited talk in the 5th Third Pole Environment organized by Senckenberg Nature Research Institute and University of Tuebingen, Berlin, Germany, 8-12 December, 2014

National:

- Participated as a Resource person in a Summer School and Capacity Building Program on Glaciology at University of Kashmir funded by DST New Delhi, 14-16 October 2023.

- Delivered a lecture in a workshop on Climate Change Impact in Rural Ecosystem of Central Himalaya: Adaptation through Local Traditional Knowledge and Innovation organized by Department of Environment Science, HNBGU Srinagar Garhwal on 26/11/2022.
- Delivered a talk entitled Advances in ground based monitoring of Himalayan Cryosphere in science meet on 'Frontiers in Remote Sensing of Cryosphere' organised by Space Application Centre (ISRO) Ahmedabad on 03 August 2022.
- Delivered a lecture as a resource person in Short Term Course on Disaster Management organized by UGC-Human Resource Development Centre, Guru Ghasidas Vishwavidyalaya, Bilaspur on 16/09/2021.
- Participated in a meeting on Evolution of Cryosphere Program in Indian Himalaya of DST (GOI) New Delhi at Divecha Centre for Climate Change, Indian Institute of Science, Bangalore, 24 April, 2019
- Delivered a talk in the International conference on State of the Cryosphere in the Himalaya With a focus on Sikkim and eastern Himalayas- gaps, challenges and opportunities, Sikkim University, Gangtok, 19-20 February 2018
- Presented a lecture on Lesson from failures of roads and bridges in the high altitude areas in 2nd Meeting of Disaster Management Committee (G-6), IRC Bhawan, RK Purum, New Delhi, 27 July, 2018
- Invited talk in National Conference on Himalayan Cryosphere organized by Indian Institute of Science, Bangalore, 23-24 January, 2017, Also chaired a session in this conference
- Attended 5th Group Monitoring Workshop & 6th meeting of the Program Advisory Committee for Earth and Atmospheric Sciences, SERB, DST, New Delhi, at Institute of Seismological Research, Gandhinagar, Gujarat, 18-20 September, 2017
- Attended Symposium on Higher Education: Challenges, Best Practices and Social Accountability, organized by SDSU University and HNBGU Srinagar, 23 May, 2017
- Delivered a key note talk in National Conference on Lakes Rivers and Wetlands Climate Change Perspectives, Department of Earth Sciences, Annamalai University, Tamilnadu, 29 March, 2016, Also chaired a session in this conference
- Delivered a talk in National Conference on "Science and Geopolitics of Arctic & Antarctic" organized by SaGAA, India International Centre, Max Mueller Marg, New Delhi, 29-30 September, 2015
- Delivered a talk on Landslides risk in Higher Himalayan terrain in Round table meeting on Landslide risk reduction organized by INAE Forum on Engineering Intervention in Disaster Mitigation at CSIR-Central Road Research Institute, New Delhi, 4 November, 2015
- Delivered an interactive lecture in the training program entitled climate change and carbon mitigation organized by Indian Council of Forestry Research and Education, Dehradun to the scientists and technologists working in government sectors, 05 January, 2015

- Attended the National Seminar on climate change, resources, bio-diversity and environmental challenges: issues and strategies for sustainable development, Organized by Department of Geography, HNB Garhwal University, Srinagar Garhwal, Uttarakhand, 28-30 October, 2015
- Attended the National Conference on Microbes in extreme environments: Diversity and translational applications, organized by Department of Botany and Microbiology, HNB Garhwal University, Srinagar Garhwal, 30 October, 2015
- Attended a workshop on Estimation of glacier stored water in the Himalaya organized by Indian Institute of Science, Bangalore, 11-12 November, 2014
- Delivered a talk in the National Conference of Himalayan Glaciology (NCHG- 2014), organized and hosted by SERB, DST New Delhi and HP State Centre on climate change at Shimla, Himachal Pradesh on 30-31 October 2014. Also chaired a technical session IV during the above mentioned conference.
- Delivered an invited talk in a seminar on Unpacking the climate crisis- held at St Pius College, Goregaon, East Mumbai organized by Tata Institute of Social Sciences, 18 April, 2014
- Attended a DST sponsored meeting on Development of Ice core program for Himalayan glaciers organized by Indian Institute of Science, Bangalore, 11 April, 2014
- Delivered an invited talk in National Conference on climate change and social vulnerability assessment organized by Department of Forestry, HNBSGU, Srinagar Garhwal, 19-20 February, 2014
- Keynote speaker in National symposium on eco-disasters in the Himalayas-causes challenges and management, Department of Environmental Sciences, HNBSGU, Srinagar Garhwal, 15 February, 2014
- Participated as member in 1st to 6th meetings of Programme Advisory Committee on Himalayan Glaciology of DST (GOI) New Delhi organized at WIHG Dehradun, University of Delhi, PEC Chandigarh, Sikkim State Council for Science and Technology Gangtok, HNBSGU Srinagar and State Council for Science and Environment, Shimla during 2012-2014
- Attended a collaboration meeting regarding our joint project with IIMSc Chennai, IISER Kokatta at Institute of Mathematical Sciences, Chennai, 26-30 March, 2014
- Delivered an invited talk entitled „Glaciers of Upper Alaknanda Basin and climate change“ in the National Seminar on Geo-environmental hazards and Neotectonic activities in Himalaya, organized by Department of Geology, HNB Garhwal University Campus, Badshahi Thaul, Tehri Garhwal, October 28-30, 2014.
- Participated in one day State Consultation on Planning and Management of Disasters in Uttarakhand Mountain State organized by Department of Geography HNBSGU Srinagar Garhwal on 19 Jan. 2014.

Publications in Journals:

1. Ashish Pal, Dilip Kumar Yadav, Naresh Kumar, Abhishek Kumar Gupta, Ajay Paul, H.C. Nainwal (2024). Modelling of source parameters of local earthquakes and

seismotectonic implications in Siang Valley, NE India. Accepted for publication in *Journal of Earth System Science*.

2. Laha, S., Winter-Billington, A., Banerjee, A., Shankar, R., **Nainwal, H. C.**, & Koppes, M. (2023). Estimation of ice ablation on a debris-covered glacier from vertical debris-temperature profiles. *Journal of Glaciology*, 69(273), 1-12.
3. Mishra, S., Slabunov, A. I., **Nainwal, H. C.**, Singh, V. K., Singh, P. K., Nesterova, N. S., & Svetov, S. A. (2022). Palaeoproterozoic S-type granites from Garhwal Himalaya, NW India: Geochemistry, Sm–Nd isotope systematics and tectonic implications. *Geological Journal*, 57(6), 2443-2463.
4. Pattanaik, J. K., Singh, A., Kumar, H., Shah, S. S., Semwal, P., Naik, M. S., ... **Nainwal, H.C.**, & Shankar, R. (2022). Luminescence chronology of Late Quaternary palaeo-lake deposits from the Upper Alaknanda Basin, Uttarakhand, India: Implication to palaeoclimate and depositional settings. *Journal of Asian Earth Sciences*, 227, 105079.
5. Mishra, A., **Nainwal, H. C.**, Bolch, T., Shah, S. S., & Shankar, R. (2022). Glacier inventory and glacier changes (1994–2020) in the Upper Alaknanda Basin, Central Himalaya. *Journal of Glaciology*, 1-16.
6. Sandeep, K., Panicker, A. S., Gautam, A. S., Beig, G., Gandhi, N., Sanjeev, S., ... & **Nainwal, H. C.** (2022). Black carbon over a high altitude Central Himalayan Glacier: Variability, transport, and radiative impacts. *Environmental Research*, 204, 112017.
7. **Nainwal, H. C.**, Shankar, R., Mishra, A., Mishra, S., Pandey, A., Shah, S. S., ... & Kumar, D. (2022). A comprehensive and quantitative assessment of Raunthi Gad flash flood, Rishi Ganga catchment, central Himalaya, Uttarakhand, India. *Natural Hazards*, 114(1), 157-181.
8. Pandey, A., Garg, P. K., **Nainwal, H. C.**, Rathore, B. P., & Bahuguna, I. M. (2022). Comparative assessment of two neighbouring glaciers (Raj Bank and Kosa), Dhauliganga Basin, central Himalaya, India, since 1962 to 2019. *Journal of Earth System Science*, 131(4), 214.
9. Remya, S. N., Kulkarni, A. V., Hassan Syed, T., & **Nainwal, H. C.** (2022). Glacier mass loss in the Alaknanda basin, Garhwal Himalaya on a decadal scale. *Geocarto International*, 37(10), 3014-3032.
10. Thakur, D., Bartarya, S. K., **Nainwal, H. C.**, & Dutt, S. (2022). Impact of environment and LULC changes on groundwater resources in the Soan Basin, western Himalaya. *Environmental Monitoring and Assessment*, 194(9), 612.
11. Anupam Anand Gokhale, Dwarika Prasad Dobhal and **Harish Chandra Nainwal**, 2021. Source characterization of suspended sediments transported from debris-covered Chorabari Glacier in Central Himalaya, India. *Arabian Journal of Geosciences*, 14:2339.
12. K. Sandeep, A.S. Panicker, Alok Sagar Gautam, G. Beig, Naveen Gandhi, Sanjeev S., R. Shankar, **H.C. Nainwal**, 2021. Black carbon over a high altitude Central Himalayan Glacier: Variability, transport, and radiative impacts. *Environmental Research*, Volume 204 (B), 112017.
13. Alok Sagar Gautam, **Harish Chandra Nainwal**, R.S. Negi, Sanjeev Kumar, Karan Singh, 2021. Study of the aerosol parameters and radiative forcing during COVID-19

- pandemic over Srinagar Garhwal, Uttarakhand. In: *Environmental Resilience and Transformation in times of COVID-19 – Climate change effects on environmental functionality*; eds. A.L. Ramanathan, S. Chidambaram, M.P. Jonathan, M.V. Prasanna and F.M. Arriola), Elsevier Publication; 63-171
14. Mishra, A., **Nainwal, H.C.**, Dobhal, D.P., Shankar, R., 2021. Volume estimation of glaciers in Upper Alaknanda Basin, Garhwal Himalaya using numerical and scaling methods with limited field based data. *Himalayan Geology*, Vol. 42 (2), 336-344..
 15. Gambhir Singh Chauhan, **H.C. Nainwal** and Vikram Gupta, 2021. Geological and geotechnical studies of landslides located near Ichhari Dam Reservoir on Tons valley, Uttarakhand Himalaya. *Himalayan Geology*, Vol. 42 (2), 372-381.
 16. K Sandeep, AS Panicker, AS Gautam, PD Safai, G Beig, **HC Nainwal**, DS Bisht, S Das, 2021. Observations of black carbon and albedo over a Central Himalayan Glacier (Satopanth): Preliminary results. *Journal of Atmospheric and Solar-Terrestrial Physics*, Vol. 216.
 17. A.S. Panicker, K. Sandeep, Alok Sagar Gautam, H.K Trimbake, **H.C. Nainwal**, G. Beig, D.S Bisht, S. Das, 2021, Black carbon over a central Himalayan Glacier (Satopanth): Pathways and Direct Radiative impacts, *Science of the Total Environment*, volume 766, 1-8.
 18. Neeraj Pant, Prabhat Semwal, Suhas Damodar Khobragade, Shive Prakash Rai, Sudhir Kumar, Rajendra Kumar Dubey, Jacob Noble, Suneel Kumar Joshi, Yadhvir Singh Rawat, **Harish Chandra Nainwal**, Sunil Shah, Aditya Mishra, Rajeev Saran Ahluwalia, 2021, Tracing the isotopic signatures of cryospheric water and establishing the altitude effect in Central Himalayas: A tool for cryospheric water partitioning, *Journal of Hydrology*, 595, 1-17.
 19. S. N. Remya, Anil V. Kulkarni, Tajdarul Hassan Syed, **Harish Chandra Nainwal**, 2020, Glacier mass loss in the Alaknanda basin, Garhwal Himalaya on a decadal scale, *Geocarta International (TGEI)*, Taylor and Francis Group, UK, 1-19.
 20. Sunil Singh Shah, Argha Banerjee, **H.C. Nainwal** and R. Shankar, 2019, Estimation of the total sub-debris ablation from point-scale ablation data on a debris-covered glacier, *Journal of Glaciology*, 65 (253), 759-769.
 21. Khobragade, S. D., Semwal, P., Kumar, A. S. and **Nainwal, H. C.**, 2019, Pan coefficients for estimating open-water surface evaporation for a humid tropical monsoon climate region in India, *Journal of Earth System Science*, 128(7), 175.
 22. Sumit Mishra, Vinod K. Singh, Alexander I. Slabunov, **H. C. Nainwal**, Pradip K. Singh, Neeraj Chaudhary and D. C. Nainwal, 2019, Geochemistry and geodynamic setting of Paleoproterozoic granites of Lesser Garhwal Himalaya, India, *Journal of Geoscience, Engineering, Environment and Technology*, Special Vol. 04(1-2), 28- 38.
 23. Panicker, A.S., Sandeep, K., Gautam, A.S., Gandhi, N., Beig, G., **Nainwal, H. C.** and Waghmare, V., 2019, Chemical composition and isotopic signatures of ice and snow over a Himalayan Glacier (Satopanth) in India. *SN Applied Sciences*, 1(10), 1166.
 24. Syed Shams Rizvi, **H. C. Nainwal**, Prabhat Semwal, Sarfaraz A. Ansari and Tushar Sharma, 2019, Glacier recession and their impact: some observation from Panpatiya,

- Bhagnyu bank and Tipra glaciers using Geospatial methods, Uttarakhand, India, *International Journal of Innovative Knowledge Concepts*, ISSN-2454-2415, 7(2), 59-65.
25. Divya Thakur, S.K. Bartarya and **H.C. Nainwal**, 2018, Mapping groundwater prospect zones in an intremontane basin of the outer Himalaya in India using GIS and remote sensing techniques, *Environmental Earth Sciences*, 77:362, doi.org/10.1007/s12665-018-7552-x.
 26. Shukla, T., Mehta, M., Jaiswal, M.K., Srivastava, P., Dobhal, D.P., **Nainwal, H.C.** and Singh, A.K., 2018, Late Quaternary glaciation history of monsoon-dominated Dingad basin, central Himalaya, India, *Quaternary Science Reviews*, 181, 43-64.
 27. Divya Thakur, S.K. Bartarya and **H.C. Nainwal**, 2018, Groundwater quality assessment of the Soan Basin in Outer Himalaya, Himachal Pradesh, India, *Himalayan Geology*, 39(2), 189-197.
 28. Mishra, A., Negi, B.D.S., Banerjee, A., **Nainwal, H.C.** and Shankar, R., 2018, Estimation of ice thickness of the Satopanth Glacier, Central Himalaya using ground penetrating radar, *Current Science*, 114(4), 785.
 29. Sharma, T., Semwal, P., Shah, S.S., **Nainwal, H.C.** and Mishra, A., 2018, General Geomorphological Field Observations around Satopanth Glacier Area, Garhwal Himalaya, Uttarakhand, *International Journal of Research and Analytical Reviews (IJRAR)*, 5(4), 493-508.
 30. Divya Thakur, S.K. Bartarya and **H.C. Nainwal**, 2018, Tracing ionic sources and geochemical evolution of groundwater in the intermountain Una basin in Outer NW Himalaya, Himachal Pradesh, *Environmental Earth Sciences*, 77:720, doi.org/10.1007/s12665-018-7891-7.
 31. Gambhir Singh Chauhan, **H.C. Nainwal** and Vikram Gupta, 2018, Stability analysis of rock cut slopes along the Minas road between Ichhari Dam and Minas Bridge, Tons valley, Garhwal Himalaya, *Himalayan Geology*, 39(1), 2018, 58-68.
 32. Sourav Laha, Reshama Kumari, Sunil Singh, Aditya Mishra, Tushar Sharma, Argha Banerjee, **Harish Chandra Nainwal**, R. Shankar, 2017, Evaluating the contribution of avalanching to the mass balance of Himalayan glaciers, *Annals of Glaciology*, 58 (75pt2), 110-118.
 33. Chaurasia, A.K., Pandey, H.K., **Nainwal, H.C.**, Singh, J. & Tiwari, S.K., 2017, Stability analysis of rock slopes along Gangadarshan, Pauri, Garhwal, Uttarakhand, *Journal of the Geological Society of India*, 89(6), 689-696.
 34. P. Semwal, S.D. Khobragade and **H.C. Nainwal**, 2017, Modelling of Recent Erosion Rates in a Lake Catchment in the North-Western Siwalik Himalayas, *Environmental Processes*, 4(2), 2017, 355-374.
 35. Alok Sagar Gautam and **H.C. Nainwal**, 2017, Impact of Black Carbon and Other Aerosols on Himalayan Glaciers: A Brief Review, *Journal of Climate Change*, 3(1), 83-92.
 36. Tanuj Shukla, Manish Mehta, Vipin Kumar, **H.C. Nainwal** and D.P. Dobhal, 2017, Application of the Schmidt-Hammer with relative-age dating of moraine boulders-a case study from Mandakini River valley, central Himalaya, India, *Himalayan Geology*,

38(2), 184-192.

37. **H.C. Nainwal**, A. Banerjee, R. Shankar, P. Semwal and T. Sharma, 2016, Shrinkage of Satopanth and Bhagirath Kharak Glaciers, India, from 1936 to 2013, *Annals of Glaciology*, 57(71), 131-139.
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