

Rakesh BHAMBRI

PhD, Scientist 'C'

Wadia Institute of Himalayan Geology,
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E-mail: rakeshbhambri@gmail.comWeb: <https://sites.google.com/view/rakeshbhambri/>Google Scholar: <https://scholar.google.co.in/citations?user=zbLJG2IAAAAJ&hl=en>**EDUCATION**

- PhD awarded 2012 Analysis of Glacier Changes in Garhwal Himalayas using Remote Sensing & GIS.
PhD advisers Dr. Subhash Chandra Kulshreshtha, Chaudhary Charan Singh
University & Dr. Ravinder Kumar Chaujar, Wadia Institute of Himalayan Geology
- Jul. 2005 – Nov. 2005 Indian Institute of Remote Sensing, Dehradun Certificate Course on 'Geoinformatics
in Geosciences' with Grade 'A'
- Jun. 2004 State Eligibility Test for Lectureship (Haryana), UGC
- Aug. 2001 – Aug. 2003 Kurukshetra University, Haryana
Master of Science: Geography (70%), **Gold Medalist**
- Aug. 1998 – Jul. 2001 Swami Shraddhanand College, University of Delhi
Bachelor of Arts (Honours): Geography (69%), ranked **1st** in College

RESEARCH & TEACHING EXPERIENCE: GEOGRAPHY, GLACIOLOGY, GEOINFORMATICS

- Since May 2022 Scientist 'C', Wadia Institute of Himalayan Geology, 33, GMS Road, Dehradun –
248001, Uttarakhand
- Nov. 2020 – May 2022 Senior Lecturer, Department of Geography, South Asia Institute, **Heidelberg
University**, Voßstraße 2 / 4130, D-69115 Heidelberg, Germany
- Mar. 2012 – June 2020 Scientist 'B', Centre for Glaciology, Wadia Institute of Himalayan Geology, 33,
GMS Road, Dehradun – 248001, Uttarakhand
- Aug. 2010 – Mar. 2012 Research Associate, Centre for Glaciology, Wadia Institute of Himalayan Geology,
33, GMS Road, Dehradun – 248001, Uttarakhand
- May. 2009 – Aug. 2010 Research Associate, Central Soil Salinity Research Institute, Soil and Crop
management division, Kachawa Road, Karnal-132001, Haryana
- Jul. 2004 – Apr. 2005 Lecturer, Geography Department, Guru Nanak Khalsa College, Karnal, Haryana
- Aug. 2003 – Apr. 2004 Lecturer, Geography Department, Guru Nanak Khalsa College, Karnal, Haryana

REFERENCES

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D-69115 Heidelberg, Germany
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Professor Umesh Haritashya
Department of Geology
University of Dayton, 300 College Park, Dayton,
OH 45458 USA,
Email: uharitashya1@udayton.edu

Professor (Emeritus) Kenneth Hewitt
Department of Geography and Environmental
Studies, Wilfrid Laurier University
Waterloo, Canada
Email: khewitt@wlu.ca

RESEARCH EXPEDITIONS IN GLACIOLOGY

Dokriani Glacier (2010, 2011, 2012, 2013, 2024), Chorabari Glacier (2005; 2009, 2011), Gangotri Glacier (2007, 2015, 2017, 2019), Garhwal Himalaya; Hamtah Glacier (2012), Lahaul Spiti, Himachal Pradesh; Siachen and many other glaciers in eastern Karakoram (2017, 2018, 2022, 2023, 2024)

EDITORSHIP, REVIEWS, PROJECTS & COMPUTER SKILLS

Scientific Editor since 2019: **Journal of Glaciology, International Glaciological Society**

Associated Editor since 2023: **Himalayan Geology, Wadia Institute of Himalayan Geology**

Article reviews (~70): [*Nature Climate Change*](#), [*Journal of Glaciology*](#), [*Annals of Glaciology*](#), [*Remote Sensing of Environment*](#), [*The Cryosphere*](#), [*Earth System Science Data*](#), [*Scientific Report*](#), [*Science of Total Environment*](#), [*Geomorphology*](#), [*Current Science*](#), [*International Journal of Digital Earth*](#), [*Cold Regions Science and Technology*](#), [*Arabian Journal of Geosciences*](#), [*Journal of Earth System Science*](#), [*Natural Hazards*](#), [*International Journal of Remote Sensing*](#), [*International Journal of Climatology*](#), [*Mountain Research and Development*](#), [*Journal of Mountain Science*](#), [*Global and Planetary Change*](#), [*Hydrological Sciences Journal*](#), [*Arctic, Antarctic, and Alpine Research*](#), [*Himalayan Geology*](#), [*SN Applied Sciences*](#)

Outstanding Reviewer Award [*Remote Sensing of Environment*](#) **2018**

Project referee (6): *Science & Engineering Research Board (SERB), a statutory body under the Department of Science, Government of India.*

Himalayan Cryospheric Observations and Modelling (HiCOM) initiative by National Centre for Antarctic and Ocean Research (NCAOR), Ministry of Earth Sciences (MoES).

Project (1): Mega project (Rs. Thirty two lakh) ‘*Damage Assessment Mapping of Bhagirathi River Valley with special reference to an extreme rainfall event of the June 2013*’, Co-investigator, Funding Agency - Ministry of Science and Technology, Indian Government. Duration 12 months, Status – Completed.

PhD supervision: Two students are pursuing their PhD through an AcSIR fellowship.

Training:	20 M.Sc. / M.Tech Dissertation and 25 summer interns
GIS and image analysis software:	ArcGIS, SAGA, ENVI, PCI Geomatica, Erdas Imagine LPS, QGIS.
Programming Skills:	Python and R Programming Language
Instruments:	Operating Steam drill, dGPS, Total Station
Graphical software:	Photoshop, CorelDraw, Origin.

PROFESSIONAL TRAINING

- Attended one-week training workshop on ‘**Geodetic Glacier Mass Balance Assessments**’ during the 27–31 January 2014, organized by International Centre for Integrated Mountain Development (ICIMOD), Kathmandu, Nepal.
- Attended four weeks ‘**Field Training Course in Glaciology**’ organized by Geological Survey of India at Hamtah Glacier, Himachal Pradesh from 07/08/2012 to 03/09/2012.
- Attended one-week basic training course on ‘**Himalayan Glaciology**’ organized by Wadia Institute of Himalayan Geology from 06/09/2010 to 15/09/2010.
- Attended two weeks special course on "**Performance Evaluation of Canal Irrigation Projects using Remote Sensing and GIS**" organized by Indian Institute of Remote Sensing (IIRS), Dehradun from 15/04/2010 to 24/04/2010.
- Attended one week GIS training program on ‘**Introduction to ArcGIS 9**’ organized by ESRI India, New Delhi from 11/10/2004 to 15/10/2004.

MEMBERSHIPS

Since 2012: Indian Meteorological Society – IMS – www.imd.gov.in/ims/

Since 2014: Himalayan Geology Society – HGS – www.himgeology.com/himgeol/himalayan.htm

Since 2020: American Geophysical Union – AGU – <https://www.agu.org/>

Since 2022: Indian Society of Remote Sensing – ISRS – <https://www.isrs-india.org/>

PUBLICATIONS

PEER-REVIEWED JOURNALS

- [37] [Bhambri R.](#) (2024). Contributions of Kenneth Mason to the physical geography of Himalaya and Karakoram. *Progress in Physical Geography: Earth and Environment*, 48(4), 637-645. <https://doi.org/10.1177/03091333241264117>
- [36] Sahu, R., Ramsankaran, R., [Bhambri R.](#), Verma, P. and Chand, P. (2023) Evolution of Supraglacial Lakes from 1990 to 2020 in the Himalaya–Karakoram Region Using Cloud-Based Google Earth Engine Platform. *J Indian Soc Remote Sens.* <https://doi.org/10.1007/s12524-023-01773-2>
- [35] Verma, A., Kumar, A., Tiwari, S.K., [Bhambri R.](#), Sain, K., Rai, S.K. and Patidar, P., (2023) Heterogeneity in glacio-hydrological processes and estimation of different components in streamflow from central Himalayan glaciers. *Journal of Hydrology: Regional Studies*, 49, p.101495. <https://doi.org/10.1016/j.ejrh.2023.101495>
- [34] Kaur, S., Yadav, J.S., [Bhambri R.](#), Sain, K. and Tiwari, S.K., (2023) Assessment of geothermal potential of Kumaun Himalaya: A perspective for harnessing green energy. *Renewable Energy.* <https://doi.org/10.1016/j.renene.2023.05.112>

- [33] Bhambri R., Schmidt, S., Chand, P., Nüsser, M., Haritashya, U., Sain, K., Tiwari, S.K. and Yadav, J.S., (2023): Heterogeneity in glacier thinning and slowdown of ice movement in the Garhwal Himalaya, India. *Science of The Total Environment*, 875, p.162625. <https://doi.org/10.1016/j.scitotenv.2023.162625>
- [32] Bhambri R., Sain, K., Chand, P., Srivastava, D., Tiwari, S.K. and Yadav, J.S., (2023): Frontal Changes of Gangotri Glacier, Garhwal Himalaya, between 1935 and 2022. *Journal of the Geological Society of India*, 99(2), pp.169-172. <https://doi.org/10.1007/s12594-023-2283-3>
- [31] Baiswar, A., Yadav, J.S., Sain, K., Bhambri R., Pandey, A. and Tiwari, S.K., (2023): Emission of greenhouse gases due to anthropogenic activities: an environmental assessment from paddy rice fields. *Environmental Science and Pollution Research*, 30(13), pp.37039-37054. <https://doi.org/10.1007/s11356-022-24838-0>
- [30] Bhambri, R., Hewitt, K., Haritashya, U.K., Chand, P., Kumar, A., Verma, A., Tiwari, S.K. and Rai, S.K., (2022): Characteristics of surge-type tributary glaciers, Karakoram. *Geomorphology*, 403, p.108161. <https://doi.org/10.1016/j.geomorph.2022.108161>
- [29] Shugar, D.H., Jacquemart, M., Shean, D., Bhushan, S., Upadhyay, K., Sattar, A., Schwanghart, W., McBride, S., de Vries, M.V.W., Mergili, M., Emmer, A., Deschamps-Berger, C., McDonnell, M., Bhambri, R., Allen, S., Berthier, E., Carrivick, J.L., Clague, J.J., Dokukin, M., Dunning, S.A., Frey, H., Gascoin, S., Haritashya, U.K., Huggel, C., Kääb, A., Kargel, J.S., Kavanaugh, J.L., Lacroix, P., Petley, D., Rupper, S., Azam, M.F., Cook, S.J., Dimri, A.P., Eriksson, M., Farinotti, D., Fiddes, J., Gnyawali, K.R., Harrison, S., Jha, M., Koppes, M., Kumar, A., Leinss, S., Majeed, U., Mal, S., Muhuri, A., Noetzi, J., Paul, F., Rashid, I., Sain, K., Steiner, J., Ugalde, F., Watson, C.S., Westoby, M.J., (2021): A massive rock and ice avalanche caused the 2021 disaster at Chamoli, Indian Himalaya. *Science* (80-.). 373, 300 LP – 306. <https://doi.org/10.1126/science.abh4455>
- [28] Dobhal, D.P., Pratap, B., Bhambri, R. and Mehta, M., (2021): Mass balance and morphological changes of Dokriani Glacier (1992–2013), Garhwal Himalaya, India. *Quaternary Science Advances*, p.100033. <https://doi.org/10.1016/j.qsa.2021.100033>
- [27] Mal, S, Kumar, A, Bhambri, R, Schickhoff, U, Singh, R.B, (2020): Inventory and Spatial Distribution of Glacial Lakes in Arunachal Pradesh, Eastern Himalaya, India. *Journal of Geological Society of India* 96, 609–615.
- [26] Singh R M, Govil H, Shahi A S, and Bhambri R* (2020): Characterizing the Glacier Surge Dynamics in Yarkand basin, Karakoram using Remote Sensing. *Quaternary International*. <https://doi.org/10.1016/j.quaint.2020.06.042>
- [25] Bhambri R, Watson C S, Hewitt K, Haritashya U, Kargel J S, Shahi A P, Sharma P, Kumar A, Verma A, and Govil H (2020): The hazardous 2017-2019 surge and river damming by Shispare Glacier, Karakoram. *Scientific Reports* 10, 4685.
- [24] Misra A, Kumar A, Bhambri R, Haritashya U K, Verma A, Gupta A K, Dobhal D P, Gupta G. and Upadhyay R. (2020): Topographic and climatic influence on seasonal snow cover: Implications for the hydrology of ungauged Himalayan basins, India *Journal of Hydrology* 585, 124716.
- [23] King O, Bhattacharya A, Bhambri R, and Bolch T (2019): Glacial lakes exacerbate Himalayan glacier mass loss. *Scientific Reports*, 9(1), pp.1-9.
- [22] Bhambri R, Hewitt K, Kawishwar P, Kumar A, Verma A, Snehmani, Tiwari S, Misra A (2019): Ice-dams, outburst floods, and movement heterogeneity of glaciers, Karakoram. *Global and Planetary Change* 180, 100-116.

- [21] Kumar A, [Bhambri R*](#), Tiwari S K, Verma A, Gupta A K, and Kawishwar P (2019): Evolution of debris flow and moraine failure in the Gangotri Glacier region, Garhwal Himalaya: Hydro-geomorphological aspects. *Geomorphology*. 333, 152-166.
- [20] Kumar A, Gupta A K, [Bhambri R](#), Verma, A, Tiwari S K, and Asthana, A K L (2018): Assessment and review of hydrometeorological aspects for cloudburst and flash flood events in the third pole region (Indian Himalaya). *Polar Science* 18, 5-20.
- [19] Kumar A, Verma A, Gokhale A A, [Bhambri R](#), Misra A, Sundriyal S, Dobhal D P and Kishore N, (2018): Hydrometeorological assessments and suspended sediment delivery from a central Himalayan glacier in the upper Ganga basin. *International Journal of Sediment Research* 33(4), 493-509.
- [18] Verma A, Kumar A, Gupta A K, Tiwari S K, [Bhambri R](#), Naithani S (2018): Hydroclimatic significance of stable isotopes in precipitation from glaciers of Garhwal Himalaya, Upper Ganga Basin (UGB), India. *Hydrological Processes* 32, 1874-1893.
- [17] Tiwari S K, Kumar A, Gupta A K, Verma A, [Bhambri R](#), Sundriyal S, and Yadav J (2018): Hydrochemistry of meltwater from Dokriani Glacier during early and draining late ablation season, West Central Himalaya. *Himalayan Geology* 39(1) pp. 121-132.
- [16] [Bhambri R](#), Mishra A, Kumar A, Gupta A K, Verma A and Tiwari S K (2018): Glacier Lake inventory of Himachal Pradesh. *Himalayan Geology* 39(1) pp.1-32.
- [15] [Bhambri R](#), Hewitt, K., Kawishwar, P. and Pratap, B., (2017): Surge-type and surge-modified glaciers in the Karakoram. *Scientific Reports*, 7(1), 15391
- [14] [Bhambri R](#), Mehta M, Singh S, Jayangondaperumal R, Gupta A K and Srivastava P (2017): Landslide inventory and damage assessment in the Bhagirathi Valley, Uttarakhand, during June 2013 flood. *Himalayan Geology*, 38(2), pp.193-224.
- [13] Chand P, Sharma M C, [Bhambri R](#), Sangewar C V and Juyal, N (2017): Reconstructing the pattern of the Bara Shigri Glacier fluctuation since the end of the Little Ice Age, Chandra valley, north-western Himalaya. *Progress in Physical Geography*, 41(5), pp.643-675.
- [12] Mehta M, Shukla T, [Bhambri R](#), Gupta A K and Dobhal D P (2017): Terrain changes, caused by the 15–17 June 2013 heavy rainfall in the Garhwal Himalaya, India: A case study of Alaknanda and Mandakini basins. *Geomorphology*, 284, pp.53-71.
- [11] [Bhambri R](#), Mehta M, Dobhal D P, Gupta A K, Pratap B, Kesarwani K and Verma A (2016): Devastation in the Kedarnath (Mandakini) Valley, Garhwal Himalaya during 16th-17th June, 2013: A remote sensing and ground based assessment. *Natural Hazards*. Volume 80, Issue 3, pp 1801-1822.
- [10] Pratap B, Dobhal D P, [Bhambri R](#) and Mehta M (2015): Four Decades of Glacier Mass balance Observations in Indian Himalaya: A Review. *Regional Environmental Change*. 1-16.
- [9] Pratap B, Dobhal D P, Mehta M and [Bhambri R](#) (2015): Influence of debris cover and altitude on glacier surface melting: A case study on Dokriani Glacier, Central Himalaya, India. *Annals of Glaciology*, 56(70), 9-16.
- [8] Paul F, Bolch T, Kääb A, Nagler T, Nuth C, Scharrer K, Shepherd A, Strozzi T, Ticconi F, [Bhambri R](#), Berthier E, Bevan S, Gourmelen N, Heid T, Jeong S, Kunz M, Lauknes T R, Luckman A, Merryman J, Moholdt G, Muir A, Neelmeijer J, Rankl M, VanLooy J and Van Niel T (2015): The Glaciers

- [7] [Bhambri R](#), Bolch T, Kawishwar P, Dobhal D P, Srivastava D and Pratap B (2013): Heterogeneity in glacier response in the upper Shyok valley, northeast Karakoram. *The Cryosphere*, 7, 1385-1398, doi:10.5194/tc-7-1385-2013.
- [6] Srivastava P, [Bhambri R*](#), Kawishwar P and Dobhal D P (2013): Water level changes of high altitude lakes in Himalaya-Karakoram from ICESat altimetry. *Earth System Science*, 122 (6), 1533–1543.
- [5] Pratap B, Dobhal D P, [Bhambri R](#) and Mehta M (2013): Near-surface temperature lapse rate in Dokriani Glacier catchment, Garhwal Himalaya, India. *Himalayan Geology*, 34 (2), 183-186.
- [4] [Bhambri R](#), Bolch T and Chaujar R K (2012): Frontal recession of Gangotri Glacier, Garhwal Himalayas, from 1965-2006, measured through high resolution remote sensing data. *Current Science*, 102 (3), 489-494.
- [3] [Bhambri R](#), Bolch T, Chaujar R K and Kulshreshta S C (2011): Glacier changes in the Garhwal Himalayas, India 1968 - 2006 based on remote sensing. *Journal of Glaciology*, 57 (203), 543-556.
- [2] [Bhambri R](#), Bolch T and Chaujar R K (2011): Mapping of Debris-covered Glaciers in the Garhwal Himalayas using ASTER DEMs and Thermal Data. *International Journal of Remote Sensing*, 32 (23), 8095-8119.
- [1] [Bhambri R](#) and Bolch T (2009): Glacier Mapping: A Review with Special Reference to the Indian Himalayas. *Progress in Physical Geography*, 33 (5), 672-704.

BOOKS

- [Bhambri R](#), Mehta M, Dobhal D P, and Gupta A K (2015): Glacier lake inventory of Uttarakhand. Special Publication of Himalayan Geology. PP-78.

BOOK CHAPTERS

- [Bhambri R](#), Mehta, M., Tiwari, S.K., Yadav, J.S. and Sain, K., 2024. High mountain hazards in Uttarakhand. In Geo-information for Disaster Monitoring and Management (pp. 181-210). Cham: Springer International Publishing. http://dx.doi.org/10.1007/978-3-031-51053-3_9
- [Bhambri R](#), Chand, P., Nüsser, M., Kawishwar, P., Kumar, A., Gupta, A.K., Verma, A., Tiwari, S.K., (2022). Reassessing the Karakoram Through Historical Archives - Environmental Change in South Asia: Essays in Honor of Mohammed Taher, in: Saikia, A., Thapa, P. (Eds.),. Springer International Publishing, Cham, pp. 139–169. https://doi.org/10.1007/978-3-030-47660-1_8
- Kumar, A, Verma, A, [Bhambri R](#), and Sain, K (2021): Time series analysis of hydrometeorological data for the characterization of meltwater storage in glaciers of Garhwal Himalaya, In Samui, P., Dixon, B., Tien Bui, D.B.T.-B. of C.G. (Eds.),. Elsevier, pp. 373–388.
- Mehta M, [Bhambri R](#), Perumal J, Srivastava P and Gupta A K (2018): Uttarakhand Calamity: A Climate Revelation in the Bhagirathi River Valley Uttarakhand, India. In Disaster Risk Governance in India and Cross Cutting Issues (pp. 193-207). Springer, Singapore.
- Racoviteanu A, Arnaud Y, Baghuna I M, Bajracharya S, Berthier E, [Bhambri R](#), Bolch T, Byrne M, Chaujar R K, Kääb A, Kamp U, Kargel J, Kulkarni A V, Leonard G, Mool P, Frauenfelder R and Sossna I (2014): Himalayan glaciers, in: Global Land and Ice Monitoring from Space: Satellite Multispectral Imaging of Glaciers, edited by: Kargel, J. S., Bishop, M. P., Kääb, A., and Raup, B. H., Praxis Springer, 549–582, doi:10.1007/978-3-540-79818-7, 2014.

[Bhambri R](#) and Chaujar R K (2009) Recession of Gangotri glacier (1962-2006) measured through Remote Sensing Data. Proceedings of National Seminar on Management Strategies for the Indian Himalaya: Development and Conservation, 1, 254-264.

OTHER JOURNALS

[Bhambri R](#), Chaujar R K and Kulshreshtha S C (2011): Automated Mapping of Debris-covered Glaciers in the Garhwal Himalayas using Remote Sensing. XXXI Inca International Congress, Indian National Cartographic Association, October 15-17, 2011.

Kesarwani K, Pratap B, [Bhambri R](#), Mehta M, Kumar A, Karakoti I, Verma A & Dobhal D P (2012): Meteorological observations at Chorabari and Dokriani glaciers, Garhwal Himalaya, India. *Journal of Indian Geological Congress* 4 (1), 125-128.

[Bhambri R](#), Bolch T and Chaujar R K (2010): Glacier Mapping in Indian Himalaya since the 19th century. *The Himalayan Journal* 66, 173-182.

TECHNICAL REPORTS

Arendt A, Bolch, T, Cogley J G, Gardner A, Hagen J O, Hock R, Kaser G, Pfeffer W T, Moholdt G, Paul F, Radic V, Andreassen L, Bajracharya S, Beedle M, Berthier E, [Bhambri R](#), Bliss A, Brown I, Burgess E, Burgess D, Cawkwell F, Chinn T, Copland L, Davies B, de Angelis H, Dolgova E, Filbert K, Forester R, Fountain A, Frey H, Giffen B, Glasser N, Gurney S, Hagg W, Hall D, Haritashya U K, Hartmann G, Helm C, Herreid S, Howat I, Kapustin G, Khromova T, Kienholz C, Koenig M, Kohler J, Krieger D, Kutuzov S, Lavrentiev I, LeBlond R, Lund J, Manley W, Mayer C, Miles E, Li X, Menounos B, Mercer A, Moelg N, Mool P, Nosenko G, Negrete A, Nuth C, Pettersson R, Racoviteanu A, Ranzi R, Rastner P, Rau F, Rich J, Rott H, Schneider C, Seliverstov Y, Sharp M, Sigurdsson O, Stokes C, Wheate R, Winsvold S, Wolken G, Wyatt F and Zheltykhina N: Randolph Glacier Inventory – A Dataset of Global Glacier Outlines: Version 3.2. Global Land Ice Measurements from Space, Boulder Colorado, USA. Digital Media.

Sethi M, Khurana ML, [Bhambri R](#), Bundela DS, Gupta SK, Ram S, Chaudhari SK and Sharma DK (2012): Appraisal Of Salt Affected Waterlogged Soils In Rohtak, Bhiwani, Jind And Jhajjar Districts Of Haryana Using Remote Sensing and GIS. Technical Bulletin : CSSRI/Karnal/Bulletin/2012/02 Central Soil Salinity Research Institute; Karnal (Haryana).

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