Dr. Vishal Singh

1. **Status at NTU:** **Postdoctoral Research Fellow (completed)**
2. **Address:** School of Civil and Environmental Engineering,
   Nanyang Technological University Singapore
   (Ranked 11th – QS World Ranking)
   50 Nanyang Avenue, Singapore 639798

   Email – vishalsingh@ntu.edu.sg, shalu.ashu50@gmail.com

3. **Education**

School, college and/or University Attended	Degree/certificate or other specialized education obtained	Date Obtained
Indian Institute of Technology Guwahati (IIT G), India	**Ph.D.** in Civil Engineering (Specialization-Water Resources Engineering and Management)	June, 2016
Allahabad Agricultural Institute Allahabad, India	**M.Tech** in Remote Sensing GIS (Specialization - Water Resources)	July, 2009

4. **Professional Certification or Membership in Professional Associations:**

   Life member of Indian Society of Remote Sensing

5. **Other Relevant Training**:

- Travel Grant (2015) by Department of Science and Engineering Research Board, Department of Science & Technology, Government of India to attend the Venice Winter School, Venice, Italy, held from 3rd January to 9th January, 2016.
- Certificate course in River Modeling Software Mike 11 by DHI Water and Environment during 25 to 27 August, 2014, New Delhi, India.
- Two months certificate course in Programming in C# using .NET v1 from NIIT, Jodhpur, India.
- July 2012: Attended International Advance Workshop on SWAT (Soil Water Assessment Tool) Model organized by Agri Life Research USA, in India.
- July 2012: Attended International Conference on SWAT (Soil Water Assessment Tool) Model organized by Agri Life Research, USA in India.
- November 2010: Attended Seven days Advance Training on Vector and Raster GIS Database using ArcGIS Desktop, ArcServer and Multiuser Geodatabase Management (ArcSDE) by ESRI India, conducted at RRSCW/NRSC, ISRO, Jodhpur, Rajasthan, India.
- October 2010: Attended Advance Training on Image processing on ERDAS IMAGINE Software by ERDAS (The Earth to Business Company) conducted at RRSCW/NRSC, ISRO, Jodhpur, Rajasthan, India.
- August ´2010: Participated and conducted 7 days Training course on Application of Remote Sensing & GIS for Water Resources at National Institute of Hydrology, Roorkee, Uttarakhand.
- May ´2008 to July ´2008: Three months certificate course on Advance Geoinformatics from Science Society of Conservation-Integration of Environment and Nature's Co-Existence, Dehradun, Uttarakhand.
- June ´2007 to July ´2007: Two months Training on Effluent Treatment plant at Mohan Meakin Ltd, Lucknow, Uttar Pradesh.

6. **Countries of Work Experience**:

India, United States of America, Italy, Singapore, Africa

7. **Languages:**

LANGUAGE	Speaking	Reading	Writing
English	Good	Good	Good
Hindi	Good	Good	Good

8. **Employment Records:**

From: November, 2017 To: February, 2018
Employer: RMSI India Pvt. Ltd. Noida, India
Positions held: Senior Technical Specialist

From: October, 2016 To: September, 2017
Employer: RMS India Pvt. Ltd. Noida, India
Positions held: Modeler

From: May, 2016 To: September, 2016
Employer: North Dakota State University, Fargo, USA
Positions held: Visiting Scholar

From: October, 2010 To: July, 2013
Employer: RRSCW, NRSC, Indian Space Research Organization, Jodhpur, India
Positions held: Research Scientist

From: February, 2010 To: September, 2010
Employer: National Institute of Hydrology, Roorkee, India
Positions held: Junior Research Fellow

From: August, 2009 To: January, 2010
Employer: AHEC, IIT Roorkee, India
Positions held: Junior Research Fellow

9. **Detailed Tasks Assigned**	**Work Undertaken that Best Illustrates Capability to Handle the Tasks Assigned**
	Name of assignment or project: ***Development of Weather Forecasting Model for India*** Year: 2017-2018 Location: Noida, India Client: RMSI India Pvt. Ltd. Main project features: Development of Rainfall and Temperature Forecasting Model for India Positions held: Senior Technical Assistant Activities performed: Analysis of global weather predictors such as LaNina3, LaNina4, MJO, TSS, TNA, SOI, SSTs, Stochastic precipitation analysis. Mutli-variate linear and non-linear regression analysis, bias correction - Name of assignment or project: ***Early Warning Flood Model Development for Rapti River, Ganga basin*** Year: 2017-2018 Location: Noida, India

	Client: RMSI India Pvt. Ltd. Main project features: Development of Rapti River Flood Model Positions held: Modeler Activities performed: , Rainfall-runoff modeling of Rapti River basin, Model optimization; Model Calibration and Validation; Flood Hazard mapping; Risk and Exposure analysis; Stochastic precipitation analysis over Ganga basin. Statistical bias correction of precipitation. - Name of assignment or project***: India Flood Model Development*** Year: 2016-2017 Location: Noida, India Client: RMS India Pvt. Ltd. Main project features: Development of India Flood Model Positions held: Modeler Activities performed: , Rainfall-runoff modeling of India River Basins, Model optimization; Model Calibration and Validation; Flood Hazard mapping; Risk and Exposure analysis; Stochastic precipitation analysis over India. Statistical bias correction of precipitation. - Name of assignment or project: ***Innovative and Strategic Program Initiatives for Research and Education-North Dakota (INSPIRE-ND)," Center for Regional Climate Studies (CRCS)***. Year: 2016 Location: North Dakota State University, Fargo, USA Client: North Dakota State University, Fargo, USA Main project features: Development of snowmelt routine for grid based model Positions held: Postdoctoral Research Associate Activities performed: Developed Snowmelt Runoff Routine (model) for large scale GRID model by incorporating variable melt factors, radiation coefficient and radiation intensity, and snow depletion curves. Snowmelt scenarios using climate model datasets. - Name of assignment or project: ***Downstream analysis of Sikkim Himalayan glaciers under climate change scenarios*** Year: 2013-2016 Location: Indian Institute of Technology Guwahati, India Client: Department of Science and Technology (DST) Main project features: Snowmelt and rainfall runoff modelling for Teesta river basin Positions held: Research Scholar Activities performed: Downscaling of CMIP5 GCMs using statistical methods. Projection of precipitation and temperature scenarios. Trend analysis of precipitation and temperature extremes. Precipitation extreme indices. Short term and long term rainfall forecasting. Performed hydrological modeling tasks using SWAT model and observed hydro-meteorological datasets; Performed hydrodynamic modeling and downstream analysis using Mike 11; Processed multispectral and temporal Remote sensing data sets such as MODIS, Landsat and IRS LISS3 for snow cover dynamics; Classification of Zemu glacier utilizing optical remote sensing and thermal remote sensing datasets; Constructed a newly hybrid classification method for glaciers; Measured Cross Sections (X sections) along Teesta river using Total Station and GPS. Projection of snowfall and snowmelt under CMIP5 GCMs. - Name of assignment or project: ***India WRIS (Water Resources Information System)*** *Year: 2010-2013* Location: RRSC-W, ISRO, Jodhpur, India Client: Central Water Commission, ISRO

	Main project features: River Basin Atlas of India Positions held: Research Scientist Activities performed: Organized water resources projects (dams, reservoirs, irrigations and hydro-electrical projects) ancillary and geodatabase for Uttar Pradesh state of India; Performed Hydrological modeling tasks for major river basins using SWAT model and SWATCUP; Processed Remote Sensing Satellite Images and extracted Snow Covers for Snow and Glacier Information System; Worked for NRC Landuse/Landover mapping and implemented in India-WRIS; Conducted and provided training for Water Resources Management to various governmental and state level agencies and officers. Climate change analysis. - Name of assignment or project: ***Watershed Atlas of India*** Year: 2010-2013 Location: RRSC-W, ISRO, Jodhpur, India Client: Ministry of Water Resources, Central Water Commission, ISRO Main project features: Watershed Atlas of India Positions held: Research Scientist Activities performed: Delineation of river basins of India using DEM; Satellite data processing; database organization; statistical analysis; preparation of maps ; quality checks for Watershed Atlas of India components - Name of assignment or project: ***Assessment of effect of sediment yield and runoff over Satluj river catchmen***t Year: 2010 Location: National Institute of Hydrology, Roorkee, India Client: Bhakra-Beas Management Board, CWC Main project features: Rainfall-runoff and sediment yield Positions held**:** Junior Research Fellow Activities performed: Performed hydrological modeling using SWAT model and observed hydro-meteorological datasets used for the model calibration at streamflow gauges of Satluj River Catchment; Processed multispectral Remote sensing data sets such as Landsat and IRS LISS3 for snow cover dynamics and preparing Landuse/Landcover maps; Done sediment yield modeling. -

10. **Publications (International Peer Reviewed Journals):**

Published

i. **Vishal Singh**, Manish Kumar Goyal, 2018. Integration of optical and thermal infrared bands to improve glacier classification and distinguishing between supraglacial debris and periglacial debris. *International Journal of Remote Sensing*, (Accepted).

ii. **Vishal Singh**, Manish Kumar Goyal. 2017. Curve number modifications and parameterization sensitivity analysis for reducing model uncertainty in the simulated and projected streamflows in Himalayan catchment. *Ecological Engineering* (Elsevier), http: // dx. doi. org /10.1016 / j.ecoleng .2017.08.002.

iii. **Vishal Singh**, Manish Kumar Goyal, Ashutosh Sharma. 2017. Projection of hydro-climatological changes over eastern Himalayan catchment by the evaluation of RegCM4 RCM and CMIP5 GCM models. *Hydrology Research* (IWA Publishing). DOI: 10.2166/nh.2017.193

iv. **Vishal Singh**, Manish Kumar Goyal. Coupled hydrological-hydrodynamic modeling approach for the downstream river flow analysis and development of rating curves in the historical and futuristic time scenarios using SWAT and Mike 11. *Journal of Hydrologic Engineering*. ASCE. DOI: 10.1061/ (ASCE) HE.1943-5584.0001530.

v. Mohsen Tahmasebi Nasab , **Vishal Singh**, Xuefeng Chu, 2017. SWAT Modeling for Depression-Dominated Areas: How Do Depressions Manipulate Hydrologic Modeling? *Water* 2016(8):2-16.

vi. **Vishal Singh**, Manish Kumar Goyal, Francisco Munoz-Arriola. 2016. Snowpack variability and hydrological uncertainty assessment in snowmelt induced streamflow over Himalayan sub-watersheds with elevation band approach. *Hydrology and Earth System Sciences*, EGU Journal. DOI: 10.5194/hess-2016-689.

vii. **Vishal Singh**, Manish Kumar Goyal, 2016. Climatic changes over the Eastern Himalayas: An analysis of the temperature extremes and the resulting extremes in precipitation by the use of CMIP5 coupled climate model. *Environmental Earth Sciences*, Springer. (2016), 75:839.

viii. **Vishal Singh**, Manish Kumar Goyal, 2015. Spatio-temporal heterogeneity and changes in extreme precipitation over eastern Himalayan catchments India. *Stochastic Environmental Research and Risk Assessment*, Springer doi: 10.1007/s00477-016-1350-3.

ix. Jayant Jangid, Manoj Josef, Apurba K Bera, **Vishal Singh**, Sandipan Raj. 2016. Potential Zones Identification for Harvesting Wind Energy Resources in Desert Region of India - A Multi Criteria Evaluation Approach Using Remote Sensing and GIS, *Renewable & Sustainable Energy Reviews*, Elsevier, 69(2016), 1-10.

x. **Vishal Singh**, Manish Kumar Goyal and Xuefeng Chu, 2015. A Multi-criteria Evaluation Approach for Assessing Parametric Uncertainty during Extreme Peak and Low Flow Conditions over Snow Glaciated and Inland Catchments, *Journal of Hydrologic Engineering*, ASCE. DOI: 10.1061/ (ASCE) HE.1943-5584.0001217.

xi. **Vishal Singh** and Manish Kumar Goyal, 2015. Analysis and trends of precipitation lapse rate and extreme indices over north Sikkim eastern Himalayas under CMIP5 ESM2-M RCPs experiments. *Atmospheric Research*. Elsevier. DOI: 10.1016 / j. atmosres. 2015.07.005.

xii. Manish Kumar Goyal, **Vishal Singh** and Akshay H Meena, 2015. Geospatial and hydrological modeling to assess hydropower potential zones and site location over rainfall dependent Inland catchment. *Water Resource Management*. Springer, DOI: 10.1007/s11269-015-0975-1.

xiii. Manish Kumar Goyal, **Vishal Singh**, 2013. Discussion of SWAT-Based Evapotranspirative Water Conservation Analysis Performed on Irrigated Croplands to Determine Potential Regional Water Savingsdz by Andrew Gayley. *Journal of Irrigation and Drainage Engineering*, ASCE, 2013. DOI: 10.1061/ (ASCE) IR.1943- 4774.0000562.

xiv. **Vishal Singh**, Niteenkumar Bankar, Sagar S Salunkhe, Apurba K Bera and J R Sharma. 2013. Hydrological stream flow modeling on Tungabhadra catchment: Parameterization and uncertainty analysis using SWAT CUP. *Current Science*, Volume 104, 9, 1187-1199.

xv. Apurba K Bera, **Vishal Singh**, Niteenkumar Bankar, Sagar S. Salunkhe, J R Sharma. 2013. Watershed Delineation in Flat Terrain of Thar Desert Region in North West India – A Semi Automated Approach Using DEM. *Journal of Indian Society of Remote Sensing*, DOI 10.1007/s12524-013-0308-x (Springer).

xvi. **Vishal Singh**, Sanjay K Jain, Sandeep Shukla. 2011. Response of hydrological factors and relationships between runoff and sediment yield in the Sub Basin of Satluj River, Western Himalaya, India. *International Journal of Civil and Structural Engineering*. IPA, Volume 2, 1, 205-221.

xvii. Sanjay K Jain, Jaiveer Tyagi, **Vishal Singh**. 2010. Simulation of Runoff and Sediment Yield for a Himalayan Watershed Using SWAT Model. *Journal of Water Resource and Protection*. SRP, 2010, 2, 267-28.

xviii. Amit Kumar, Shashivind Mishra, Kishan Singh Rawat and **Vishal Singh**. 2011. Assessment of Aeolian Sand Affected Wasteland Area in Sirsa District using Remote Sensing and GIS. *Journal of Agricultural Physics*. 11, 84-87.

xix. **Vishal Singh** and et al., (2015), Watershed Atlas of India. Regional Remote Sensing Centre, Indian Space Research Organization, Jodhpur, India.

Book Chapters:

i. Constructed Wetlands: Case Studies- Urban Water Reuse Handbook. Dongqing Zhang, Manish Kumar Goyal, **Vishal Singh** and Richard M Gersberg, Taylor and Francis, 2015. CRC Group, ISBN 9781482229141, Page 723-741.

ii. Impact of Climate Change on Drinking Water- Urban Water Reuse Handbook. Manish Kumar Goyal, **Vishal Singh** and Saeid Eslamian, 2015. Taylor and Francis, 2015. CRC Group, ISBN 9781482229141, Page 991-1016.

Conferences:

i. **Vishal Singh**, Manish Kumar Goyal, Sub-catchment wise spatio-temporal analysis of streamflow/water yield on a Himalayan catchment under the changing role of temperature, International Conference on AFHAFBC- 2014, New Delhi, India (Published).

ii. **Vishal Singh**, Manish Kumar Goyal, Akshay H Meena, Geo-informatics application for hydropower plants to site suitability analysis. Indian Society of Geomatics, Regional Conference on "Geoinformatics" Shillong, India.

iii. **Vishal Singh**, Manish Kumar Goyal, 2015. Temperature changes and their effects on snowpack variability over North Sikkim Himalayas. International Conference on Hydraulics, Water Resources and River Engineering, Roorkee, Uttarakhand, India (Published).

Vishal Singh

_____ Date: 27/March/2018

[Signature] *Day/Month/Year*