Vinit Sehgal

Google Scholar: https://goo.gl/zDF8n9
ResearchGate: https://goo.gl/ZXPyd5
Publons: http://bit.ly/2U3HMBt

Email : vinit@tamu.edu
Mobile: +1-540-394-5486
1101 Luther St. W., Apt. 634C,
College Station, TX- 77840, USA

ACADEMIC EXPERIENCE

- **Texas A&M University, College Station, TX**   Ph.D. (Pursuing), WMHS Program
  Graduate Research Assistant— Advisor: Dr. Binayak P. Mohanty   *Sep 2017 - Present; GPA: 4.0*
  Estimation of rootzone soil hydraulic properties using SMAP *(Sponsor:NASA)*

- **Virginia Tech, Blacksburg, VA**   MS, Biological Systems Engineering
  Graduate Research Assistant — Advisor: Dr. Venkat Sridhar   *Aug 2015 - June 2017; GPA: 3.91*
  Near real-time seasonal drought forecasting and retrospective drought analysis using simulated multi-layer soil moisture from hydrological models at sub-watershed scales *(Sponsors:Virginia Agricultural Experiment Station & the Hatch Program, USDA)*

- **Indian Institute of Technology, Delhi, India**   Project Associate, Department of Civil Engineering
  Advisor: Dr. Rakesh Khosa   *Oct 2014 - June 2015*
  Statistical downscaling of climatic variables using wavelet-based approach *(Sponsor: Dept. of Science & Tech., India)*

- **Birla Institute of Technology, Mesra, India**   BE, Civil Engineering
  Advisor: Dr. Rajeev Ranjan Sahay   *Aug 2012 - May 2013; CGPA: 7.71/10*
  Flood modeling of North-Bihar Rivers using soft computing methods *(Sponsor: University Grants Commission, India)*

RESEARCH INTERESTS

Soil moisture dynamics across scales — Soil hydraulic parameterization — Scaling issues in hydrology — Satellite remote sensing

ACADEMIC ACHIEVEMENTS/ RECOGNITION

- **Water Management & Hydrological Science Academic Scholarship (2020-21 & 2017-2018)**: College of Geosciences,TAMU
- **Graduate Student Competitive Scholarship (2019-20 & 2020-2021)**: Biological and Agricultural Engineering, TAMU
- **Robert E Stewart Graduate Excellence Award (2020)**: Biological and Agricultural Engineering, TAMU
- **Travel award for AGU Fall meeting (2018 & 2019)**: Received grants from WMHS Program, TAMU
- **Outstanding contribution in reviewing (2018)**: Applied Soft Computing Journal, Elsevier
- **Outstanding contribution in reviewing (2017)**: Journal of Hydrology, Elsevier
- **First position, Student poster competition, Water Daze (April, 2018), TAMU**: For poster titled: *How soil surface dries under different landcovers across the globe.*
- **Paul E. Torgersen Graduate Student Research Excellence Award (2017)**: Selected for poster presentation.
- **Erasmus Mundus Scholarship**: Selected for Flood Risk Master's Program (2015)
- **Best Paper Award (2014)**: Int'l. Conf. on Modeling Tool for Sustainable Water Resources Management, Indian Institute of Technology, Hyderabad, India, for paper titled:*Wavelets in Hydrological Modeling.*
- **Young Scientist Award (2010)**: For paper titled: *Synthesis of novel fly ash based material for wastewater treatment* at Annual Conff. of the Indian Council of Chemists.
- **All India Junior Maths Olympiad (2008)**: Held 36th rank at national level.

NOTABLE TECHNICAL SKILLS

High-performance computing for large-scale modeling, ArcSWAT, Wavelet analysis, MCMC and Bayesian methods, ML/AI methods like ANN, SVM and ANFIS.   **Coding Languages**: MATLAB, R

Service & Community engagement

- **Student member, Remote Sensing Technical Committee (2019-Present)**: American Geophysical Union
- **Travel Grant Chair (2019-20)**: BAEN Graduate Student Association
- **Lead organizer of annual R workshop (2018-20)**: *Data Visualization and Geospatial Analysis in R* at TAMU
- **Travel Grant Chair (2019-2020)**: BAEN Graduate Student Association
- **Professional Development Chair (2018-19)**: Texas A&M Water Network
- **Student Volunteering**:
  - ***Sessions Manager, IGARSS*** (2020) Moderated scientific sessions of the virtual IEEE Geoscience and Remote Sensing Society Annual Meeting.
  - ***Honors and Awards Program*** (2019) at AGU Awards ceremony at the 2019 Fall Meeting.
  - ***BAEN Undergraduate Capstone Event*** (2019): Volunteer judge at the annual capstone event.
  - ***R Expert at Coding Help-desk*** (2018 & 2019) A student-led effort for coding help at AGU Fall meeting.
  - ***Outsmart your research using contemporary technology*** (2018): On using contemporary tools for efficient research organization - with Hydrology Section Student Subcommittee at AGU Fall Meeting

- **Peer Reviewing**: Reviewed **60** papers for journals including Water Resources Research (1), Journal of Hydrology (13), Scientific Reports (2), Remote Sensing of Environment (1), Agricultural Water Management (2), Geosciences (1), Annals of the American Association of Geographers (1), Water Resources Management (1), Stochastic Environmental Research & Risk Assessment (3), Nonlinear processes in Geophysics (1), Journal of Water & Climate Change (18)
- **Professional membership**: American Geophysical Union, Soil Science Society of America

Teaching & Mentorship

- **Hydrology Across Scales (Spring 2020)**: Teaching assistant, Biological and Agricultural Engineering, TAMU. *Topics covered in class: Geostatistics, space-time variability of precipitation, Random number generation, Fourier transform and power spectra, time-frequency analysis using Wavelets, Upscaling/ downscaling using MCMC, Neural networks, Kalman filters, etc.*
- **Undergraduate mentoring**: Mentored one undergraduate student for 2019-2020 academic year to study soil moisture— evapotranspiration relationship over different hydroclimates.
  Expert Panel Member (2018): LAUNCH Research Workshop for Mentoring Undergraduate Researchers

Select Recent Oral Presentations

[1] Sehgal, V. Mohanty, B., 2020, December. Multiscale soil hydraulic parameterization for improved hydrologic simulations using SMAP. In AGU Fall Meeting.

[2] Sehgal, V. Mohanty, B. and Gaur, N., 2019, December. Soil and vegetative controls on global soil moisture drydowns using SMAP: Implications for large scale soil hydraulic parameterization. In AGU Fall Meeting.

[3] Sehgal, V., Gaur, N. and Mohanty, B.P., 2019, November. The Signature of Climate and Vegetative Influence on the Effective Soil Water Retention at a Continental Scale. In ASA, CSSA and SSSA Int'l Annual Meeting.

[4] Sehgal, V. and Mohanty, B., 2018, December. Soil moisture drydowns over space, time and depth: a combination of remote sensing and land surface model. In AGU Fall Meeting Abstracts.

[5] Sehgal, V. and Sridhar, 2016, December. Sensitivity analysis of soil moisture to drought indices. In American Society of Agriculture and Biological Engineers (ASABE) Annual International Meeting.

Invited Talks

[1] *Large-scale Geospatial Analysis with R*, 2020, November. Texas A&M Institute of Data Science (TAMIDS), Tech-Talk Series

[2] *Using soil moisture for drought monitoring in a warming world*, 2020, July. School of Civil engineering, Reva University, India

Select Peer-reviewed publications (Chronological order)

[1] Sehgal, V., Gaur, N. and Mohanty, B. 2021. Global Flash Drought Monitoring using Surface Soil Moisture. **Water Resources Research** (Under revision)

[2] Sehgal, V., Gaur, N. and Mohanty, B. 2020. Global Surface Soil Moisture Drydown Patterns. **Water Resources Research**, p.e2020WR027588. https://doi.org/10.1029/2020WR027588

[3] Sachindra, D.A., Ahmed, K., Rashid, M.M., Sehgal, V., Shahid, S. and Perera, B.J.C., 2019. Pros and cons of using wavelets in conjunction with genetic programming and generalised linear models in statistical downscaling of precipitation. **Theoretical and Applied Climatology**, 138(1-2), pp.617-638.

[4] Sehgal, V. Sridhar, V. and Rathinasamy, M., 2019. Comparative analysis of the performance of wavelet-based and stand-alone models in capturing non-stationarity in climate downscaling. Book Chapter: In **Water Resources and Environmental Engineering** II (pp. 195-203). Springer, Singapore.

[5] Sehgal, V. and Sridhar, V., 2018. Watershed-scale retrospective drought analysis and seasonal forecasting using multi-layer, high-resolution simulated soil moisture for Southeastern US. **Weather and Climate Extremes**, p.100191.

[6] Sehgal, V. and Sridhar, V., 2018. Effect of hydroclimatological teleconnections on the watershed-scale drought predictability in the southeastern United States. **International Journal of Climatology**, 38, pp.e1139-e1157.

[7] Sehgal, V., Sridhar, V., Juran, L. and Ogejo, J., 2018. Integrating Climate Forecasts with the Soil and Water Assessment Tool (SWAT) for High-Resolution Hydrologic Simulations and Forecasts in the Southeastern US. **Sustainability**, 10(9), p.3079.

[8] Sehgal, V., Lakhanpal, A., Maheswaran, R., Khosa, R. and Sridhar, V., 2018. Application of multi-scale wavelet entropy and multi-resolution Volterra models for climatic downscaling. **Journal of Hydrology**, 556, pp.1078-1095.

[9] Sehgal, V., Sridhar, V. and Tyagi, A., 2017. Stratified drought analysis using a stochastic ensemble of simulated and in-situ soil moisture observations.**Journal of hydrology**, 545, pp.226-250.

[10] Lakhanpal, A., Sehgal, V., Maheswaran, R., Khosa, R. and Sridhar, V., 2017. A non-linear and non-stationary perspective for downscaling mean monthly temperature: a wavelet coupled second order Volterra model. **Stochastic Environmental Research and Risk Assessment**, 31(9), pp.2159-2181.

[11] Agarwal, A., Maheswaran, R., Sehgal, V., Khosa, R., Sivakumar, B. and Bernhofer, C., 2016. Hydrologic regionalization using wavelet-based multiscale entropy method. **Journal of Hydrology**, 538, pp.22-32.

[12] Sehgal, V., Sahay, R.R. and Chatterjee, C., 2014. Effect of utilization of discrete wavelet components on flood forecasting performance of wavelet based ANFIS models. **Water resources management**, 28(6), pp.1733-1749.

[13] Sehgal, V., Tiwari, M.K. and Chatterjee, C., 2014. Wavelet bootstrap multiple linear regression based hybrid modeling for daily river discharge forecasting. **Water resources management**, 28(10), pp.2793-2811.

[14] Sahay, R.R. and Sehgal, V. 2014. Wavelet-ANFIS models for forecasting monsoon flows: case study for the Gandak River (India). **Water resources**, 41(5), pp.574-582.

[15] Sehgal, V. and Lal, B., 2014. Wavelet-based models for air pollution modelling around coal mining sites in Jharkhand for 1, 3 and 5 day lead time. **International Journal Of Environment And Pollution**, 56(1-4), pp.11-27.

[16] Sahay, R.R. and Sehgal, V. 2013. Wavelet regression models for predicting flood stages in rivers: a case study in E astern India. **Journal of Flood Risk Management**, 6(2), pp.146-155.

(Updated: May 2021)