ROSHAN WATHORE
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RESEARCH HIGHLIGHTS

- Top-tier academic education with a strong research background in cookstove design, cookstove emissions and performance characterization (lab and field), cookstove intervention studies, cleaner energy generation and environmental sensors
- Extensive experience in efficient waste and resource management. development of cleaner energy technologies, emissions after-treatment options, waste to energy processes and decentralization of renewable energy systems and using AI based tools for microgrid planning
- Industry experience in modeling and development of machine learning and deep learning algorithms and its applications in low-cost sensors and other data intensive Environmental Engineering and Chemical Engineering domains
- SAS® Certified Base Programmer (April 2018) and Predictive Modeler (June, 2018)

EDUCATION

Master of Science, Civil Engineering, Raleigh, NC, USA
North Carolina State University (NCSU), Raleigh, NC, USA, 2016

Master of Technology, Environmental Engineering and Management Kanpur, India
Indian Institute of Technology Kanpur (IITK), 2014

Bachelor of Technology, Chemical Engineering Chennai, India
Indian Institute of Technology Madras (IITM), 2012

PROJECTS AND EXPERIENCE

Scientist, CSIR – National Environmental Engineering Research Institute, Nagpur, India Mar '20– Present

Projects Undertaken as PI (Sponsor):

- Development of a Smart Environmental Sensor Facility in CSIR-NEERI under Atma Nirbhar Bharat Approach (In-house)

Projects Undertaken as Team Member (Sponsor):

- Field based Performance Assessment of Improved Rocket cook-stoves and Estimation of Benefits in Terms of Fuel and Emission Reduction (Glenmark Foundation)
- Energy conservation and management at CSIR-NEERI (In-house)
- Development of Decentralized Waste Incinerator for Combating COVID-19 Spread (In-house)
- Low-cost, Nano-materials for simultaneous removal of selenium & bacterial contamination from drinking water in India (CSIR and Czech Academy of Sciences)
- Pyrolysis of Bamboo for High Value Products (Maharashtra Bamboo Development Board, Nagpur)
- Pilot Study to Evaluate the Potential of After-exhaust Retrofit Technologies to Control Emissions from in-use Diesel Vehicles (MoEFCC)
- Collation and review of the comments received from all the stake holders on the draft EIA Notification 2020 (MoEFCC)
- Carrying capacity assessment of Sanjay Gandhi National Park (CPCB, Mumbai)
- Overseeing of Compliance Requirements for Proposed Greenfield Goa International Airport at Mopa (GMR Infra)

Environmental Data Analyst, Personal Air Quality Systems (PAQS)- Bangalore, India Sep '18–Mar '20

- Analysis of environmental and criteria pollutant data from wireless low-cost sensor networks deployed in Smart Cities in India
- High resolution time-series comparison of sensor performance against reference grade devices
- Exploratory analysis such as identification of hotspots and places of interest within a city
- Application of ML methods for calibration (SVR, ANN), spatio-temporal interpolation (GPR) and forecasting (LSTM)

Consulting Air Quality Scientist, Stockholm Environment Institute (SEI) - USA May '17–Aug '18

- Worked on a ~5-year **cookstove intervention study** with a **$1.5 million** grant funded by the **US-Environmental Protection Agency (EPA)**; collaboration of 5 North American Universities/Institutes and 2 Indian NGOs looking into health, climate and social impacts of adopting cleaner cooking technologies in two locations in rural India: Karnataka and Himachal Pradesh

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- Spearheaded field deployments of emissions and personal exposure monitors in ~500 rural Indian households for the final measurement season

Graduate Research Assistant (NC State University), USA (Advisor: Dr. A.P. Grieshop) Aug '14–Sep '17

- Worked on a **United Nations Foundation - GACC** funded project (**$50,000**) in rural **Malawi** (Africa)
- Quantified **health and climate impacts** from **in-home use of traditional, and improved cookstoves** in the field site
- Assessed **risk** associated with Heart Disease Mortality due to **exposure** of **particulate matter** from **cookstove emissions**
- Determined **global warming impact** in terms of carbon offset; subsequently traded in the carbon finance market
- Analysis of **emissions**, **personal exposure** and **ambient** particulate matter concentration data
- Laboratory measurements of biomass cookstove emissions aged in an oxidation flow reactor and explore the influence of combustion and aging conditions on organic aerosol

Research/Teaching Assistant (IITK), Kanpur, India (Advisor: Dr. A. Goel) Aug '13–May '14

- Determined PM emissions and risk associated due to incense burning in laboratory and three major temples of Kanpur City

RELEVANT PUBLICATIONS

- Islam, M. M., **Wathore, R.**, Zerriffi, H., Marshall, J. D., Bailis, R., & Grieshop, A. P. (2021). **In-use emissions from biomass and LPG stoves measured during a large, multi-year cookstove intervention study in rural India**. *Science of The Total Environment*, 758, 143698.
- **Wathore, R.**, Gupta, A., Bherwani, H., & Labhasetwar, N. (2020). **Understanding air and water borne transmission and survival of coronavirus: Insights and way forward for SARS-CoV-2**. *Science of The Total Environment*, 141486.
- **Wathore, R.**, Mortimer, K., & Grieshop, A. P. (2017). **In-use emissions and estimated impacts of traditional, natural- and forced-draft cookstoves in rural Malawi**. *Environmental science & technology*, 51(3), 1929-1938
- Goel, A., **Wathore, R.**, Chakraborty, T., & Agrawal, M. (2016). **Characteristics of exposure to particles due to incense burning inside temples in Kanpur, India**. *Aerosol and Air Quality Research*, 17(2), 608-615

RELEVANT POSTERS AND PRESENTATIONS

- Islam, M., **Wathore, R.**, Jain, G., Sethuraman, K., Bailis, R., Marshall, J., Grieshop, A.P., "Seasonality and Inter-site Variability in Cookstove Emissions Measured in a Multi-year Cookstove Intervention Trial in Rural India", AAAR 2019 Annual Conference, Portland, OR, USA, October, 2019
- Islam, M., **Wathore, R.**, Jain, G., Sethuraman, K., Bailis, R., Marshall, J., Grieshop, A.P., "Emission Factors and Optical Properties of Health and Climate Relevant Pollutants Measured in a Multi-year Cookstove Intervention Study in Rural India", (Platform), International Aerosol Conference, 2018, St. Louis, MO
- Islam, M., **Wathore, R.**, Jain, G., Sethuraman, K., Bailis, R., Marshall, J., Grieshop, A.P., "Linking PM2.5 Indoor Air Quality and Emission Factors Measured during a Cookstove Intervention Trial in Rural India.", (Poster), International Aerosol Conference, 2018, St. Louis, MO
- Islam, M., **Wathore, R.**, Jain, G., Sethuraman, K., Zerriffi H., Marshall J., Bailis R., Grieshop, A.P. "Linking emissions and indoor air quality during a cookstove intervention trial in rural India", 3rd Annual SETI Meeting, Duke University, Durham, NC, USA, 15-17 May, 2018
- Islam, M., **Wathore, R.**, Jain, G., Sethuraman, K., Bailis, R., Marshall, J., Grieshop, A.P., "Multi-Year Characterization of Cookstove Activity and Emissions Measured in Two Rural Areas in India", (Poster), Clean Cooking Forum, 2017, Delhi, India
- Islam, M., **Wathore, R.**, Jain, G., Sethuraman, K., Bailis, R., Marshall, J., Grieshop, A.P., "Multi-Year Characterization of Cookstove Activity and Emissions Measured in Two Rural Areas in India", (Platform), American Association of Aerosol Research Annual Conference, 2017, Raleigh, NC
- Grieshop, A. P., Reece, S.M., Sinha, A., **Wathore, R.**, "Laboratory Measurements of Biomass Cookstove Emissions Aged in an Oxidation Flow Reactor: Influence of Combustion and Aging Conditions on Organic Aerosol", (Poster), American Geophysical Union Fall Meeting, 2016, San Francisco, CA
- **Wathore, R.**, Grieshop, A. P., Mortimer, K., "Evaluation of the Emissions Performance of Natural and Forced Draft Cookstoves in Rural Malawi and Laboratory Settings", (Platform), American Association of Aerosol Research Annual Conference, 2016, Portland, OR