

Chris (Myeong-Ho) Yeo

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Summary

- Leader of the Working Group of "Water Resources" in the Climate Change Resiliency Commission of the Government of Guam.
- An academic committee member of Silver Jackets – Flood Risk Management for the Government of Guam.
- License of “Water Pollution Environmental Engineer” issued by Korean Human Resources
- Highly experienced in hydrologic/hydraulic modeling and numerical analyses
- Extensive research experience in climate change impacts on hydrological systems
- Experience in hydrologic/hydraulic software for stormwater and floods (HEC-HMS, HEC-RAS, InfoSWMM)
- Solid knowledge of statistical/stochastic analyses (machine learning and deep learning)
- Developer of software for assessing climate change impacts on extreme rainfalls (storms)

Areas of interest

- Modeling of hydrologic processes over different spatial and temporal scales
- Regional estimation of extreme hydrologic variables (extreme rainfalls, floods, temperature extremes)
- Stormwater management modeling and flooding modeling
- Computational Fluid Dynamics (CFDs)
- Forecasting and simulation of hydrologic series
- Environmental assessment modeling
- Climate change impacts and adaptation in water management
- Coupling climate change scenarios and watershed management models

Teaching courses

- EV511: Geoscience/Engineering
- EV542: Hydrology

Current research projects

- USGS-CNMI: (PI) A sustainable plan for stormwater management and flooding at Garapan, Saipan (CNMI: Commonwealth of the Northern Mariana Islands)
- USGS-FSM: (PI) Comprehensive hydrological database for secure water resources in Tofol watershed, Kosrae Island (FSM: Federated States of Micronesia)
- USGS-FSM: (PI) Digital Atlas of Chuuk – A Geospatial Map and Data Server for Resource Management
- Guam Hydrological Survey: (PI) Ecological contribution of groundwater discharge to the coastal ecosystem in Tumon Bay, Guam
- NASA Space Grant: (PI) Sustainable planning for floods with context of climate change or Tumon Bay

Completed research projects

- Guam EPSCoR: (PI) Exploring the Ecological Contribution of Submarine Groundwater Discharge to Coastal Ecosystems along Guam's Northwest Coastline (2020)
- NASA EPSCoR: (PI) 3-D Simulation of freshwater plumes generated by groundwater discharges around the Northern Guam Lens Aquifer, Guam (2020)

Developed software

- SDExRain: Decision-making support tool for assessing climate change impacts on extreme rainfall system. Graphic User Interface (GUI) for easily accessibility.
 - SDRain: Simulating daily precipitation series with consideration of climate change.
 - SDExtreme: Constructing IDF curves in the context of climate change for the future periods.
- WeaGETS-DEP: Stochastic weather model for generating weather information.

Experience

Assistant Professor

Water and Environmental Research Institute (WERI) of the Western Pacific University of Guam

Aug. 2019 – Current

- Surface water hydrology, hydraulics, and climate change impacts on water resources.
- Stormwater and flooding in the CNMI using InfoSWMM.
- Wastewater treatment plant improvement in the FSM.
- Identification of hydrological characteristics of watersheds in the FSM.
- Computational Fluid Dynamics for simulating groundwater plume characteristics.

Post-Doctoral Associate

New York City Dept. of Environmental Protection (NYCDEP)

Feb. 2017 – Jul. 2019

- **Project: Climate Change Integrated Modeling Project(CCIMP)**
 - Developing a stochastic model for constructing daily rainfalls at ungauged stations in order to estimate accurately streamflow rates in watershed.
 - Estimating future streamflow rate over ungauged sub-basins using SWAT, the stochastic weather model, and climate change scenarios.
 - Developing a weather model for forecasting daily precipitation and extreme rainfalls.

Post-Doctoral Fellow

McGill University – Montreal, Canada

Nov. 2014 – Jan. 2017

- **Project: FloodNET**
 - The *Canada Government Project* for evaluating climate change impacts on extreme rainfall
 - Develop a decision-making support tool for establishing new IDF curves with consideration of climate change.

Research Assistant

McGill University – Montreal, Canada

Jan. 2008 - Oct. 2014

- Participated in *two main Government-Projects*: Canada & Singapore
 - Forecasting daily temperature and precipitation under climate change condition
- Developed a new statistical downscaling model (SDRain) for forecasting daily precipitation series with climate change scenarios (CGCM, AGCM, RCM).
- Developed a statistical model for estimating sub-daily extreme rainfalls for the future.
- Proposed a new regionalization method for hydrological homogeneity.
- Developed a new stochastic approach to generating daily rainfall series at ungauged stations.

Research Assistant

Chungnam National University – Daejeon, South Korea

Mar. 2003 – Feb. 2005

- **Computational Fluid Dynamics (CFDs)**
- Participated in two Government Projects: Korean Institute of Energy Research (KIER) & Korea Atomic Energy Research Institute (KAERI)
 - Simulate fluid mechanism in nano-chamber reactors (KIER).
 - Evaluated the flow characteristics of wastewater in the treatment plant (KAERI).
- Simulated convection/diffusion features of Volatile Organic Compounds (VOCs).
- Proposed/simulated bio-capsules in wastewater to improve the efficiency.

Research Associate

Korea Institute of Toxicology – Daejeon, South Korea

Apr. 2005 -Jun. 2007

- Risk assessment of environmental pollutants and new toxic substances (pesticides) in ecosystem.
- Environmental fate test using HPLC/GC for Biodegradation and Bioaccumulation.
- Researched the residue analyses of toxic substances in crop & pear

Education

PhD Civil Engineering – Water Resources & Hydrology

Jan. 2008 - Oct. 2014

McGill University, Dept. of Civil Eng., Montreal, Canada

MSc Environmental Engineering – Computational Fluid Dynamics

Mar. 2003 – Feb. 2005

Chungnam National University, Dept. of Environmental Eng., Daejeon, South Korea

BSc Environmental Engineering

Mar. 1995 – Feb. 2003

Chungnam National University, Dept. of Environmental Eng., Daejeon, South Korea

Publications

- **Theses**
 - **Master's Thesis:** Numerical Study for Environmental Systems: Properties of Volatile Organic Compounds (VOCs) -diffusion & Bio-capsule Floating Techniques.
 - **PhD Thesis:** Statistical Modeling of Precipitation Processes for Gaged and Ungaged Sites in the Context of Climate Change.
- **Book chapter**
 - Yeo, M-H., and Nguyen, V-T-V. (2016) A Statistical Approach to Downscaling of Daily Rainfall Process at an Ungauged Site, in Advances in Hydroinformatics, edited by Philippe Gourbesville et al., Book ISBN 978-981-287-615-7, Chapter 20.
- **Peer Reviewed Articles**
 - Yeo, M-H., Nguyen, H-L. Nguyen, V-T-V. (2019) A Statistical Tool to Modelling of Daily Precipitation Process in the Context of Climate Change, Journal of Water and Climate change, DOI: <https://doi.org/10.2166/wcc.2019.403>.
 - Yeo, M-H., Frei, A., Gelda, R., and Owens, E. (2020) A Stochastic Weather Model for Generating Daily Precipitation Series at Ungauged Locations in the Catskill Mountain Region of New York State. International Journal of Climatology, [DOI:10.1002/joc.6230](https://doi.org/10.1002/joc.6230).
 - Mukundan, R., Hoang, L., Gelda, R., Yeo, M-H., Owens (2020) Water Quality Responses to Future Climate in a Water Supply Watershed, Journal of Hydrology, DOI: <https://doi.org/10.1016/j.jhydrol.2020.124868>
 - Yeo, M-H., Nguyen, V-T-V., and Kpodonu, T.A. (2020) Estimating parameters and construct Confidence Intervals for IDF curves using Scaling-GEV distribution model, International Journal of Climatology. 2020:1-13. <https://doi.org/10.1002/joc.6631>.

- Yeo, M-H., and Frei, A. (2020) Statistical Downscaling Approach to daily precipitation for ungauged locations in the Southern Quebec, Environmental Pollution and Climate Change (in review)
 - Yeo, M-H., Nguyen, V-T-V., and Kpodonu, T.A. (2020) An Integrated Extreme Rainfall Modeling Tool (SDExtreme) for Climate Change Impacts and Adaptation, Environmental Modeling & Software (in review)
- **Proceedings**
 - Yeo, M-H, Kim, H-S, Seo, M-S, Jang, D-S. (2003) Numerical study of the design of wastewater treatment system by bio-capsule floating techniques. Conference of Korea Society of Environmental Engineers.
 - Yeo, M-H, Jang, D-S, Kim, H-S, Seo, M-S. (2005) Numerical study of VOCs diffusion characteristics in the Shihwa-Industrial Area. Conference of the Korean Society of Environmental Engineers.
 - Nguyen, V-T-V., and Yeo, M-H. (2011) Statistical Downscaling of Daily Rainfall Processes for Climate-Related Impact Assessment Studies, Canadian Society for Civil Engineering (CSCE) Annual Conference, June 14-17, Ottawa, Ontario, Canada.
 - Yeo, M-H., and Nguyen, V-T-V. (2013) Statistical Modeling of Daily Rainfall Process in the Context of Climate Change, Proc. of the CSCE General Conference, May 29-June 1, Montreal, Quebec, 6 pages.
 - Yeo, M-H., and Nguyen, V-T-V. (2013) Modeling of Short-Duration Extreme Rainfall Processes for Climate-Related Impact Studies in Urban Areas, 21st Canadian Hydrotechnical Conf., May 14-17, Banff, Alberta, pp. 553-562.
 - Yeo, M-H., and Nguyen, V-T-V (2013) Statistical Modeling of Extreme Rainfall Processes in the Context of Climate Change, Proc. of the Third Climate Change Technology Conference, May 27-29, Montreal, Quebec, CCTC 2013, 12 pages.
 - Yeo, M-H., and Nguyen, V-T-V (2013) A Stochastic Approach to Generating Daily Rainfall Series at an Ungauged Site, SMART WATER GRID INTERNATIONAL CONFERENCE 2013, 12-14 November 2013, Incheon, Republic of Korea.
 - Yeo, M-H., and Nguyen, V-T-V. (2014) A Statistical Approach to Downscaling of Daily Rainfall Process at an Ungauged Site, SimHydro 2014: Modelling of rapid transitory flows, 11-13 June 2014, Sophia Antipolis.
 - Yeo, M-H., and Nguyen, V-T-V. (2014) A Spatial-Temporal Statistical Modeling of Sub-Daily Extreme Rainfall Processes for Climate Change Impact Assessment in Urban Areas, 13th International Conference on Urban Drainage, 7-12 September 2014, Sarawak, Malaysia.
 - Nguyen, V-T-V., and Yeo, M-H. (2014) A Spatial-Temporal Downscaling Approach to Construction of Rainfall Intensity-Duration-Frequency Relations in the Context of climate Change, 11th International Conference on Hydroinformatics, 17-21 August 2014, New York, New York, USA.
 - Yeo, M-H., and Nguyen, V-T-V. (2015) An Integrated Extreme Rainfall Modeling Tool for Climate Change Impacts and Adaptation in Urban Areas, 22nd Canadian Hydrotechnical Conference, 29 April - 2 May 2015, Montreal, Quebec, Canada.
 - Yeo, M-H., and Nguyen, V-T-V. (2016) A Decision Support Tool for Assessing Climate Change Impacts on Extreme Rainfall Processes, Environmental & Water Resources Institute (EWRI) World Environmental & Water Resources congress, 22-26 May, 2016, West Palm Beach, USA.
 - Yeo, M-H., and Nguyen, V-T-V. (2016) A Decision Support Tool for Assessing the Climate Change Impacts on Local Rainfall Extremes, Statistical Hydrology (STAHY) of the International Commission on Statistical Hydrology (ICSH), 26-27 September, 2016, Quebec, Canada.

- Yeo, M-H., and Nguyen, V-T-V. (2016) Statistical Downscaling of Extreme Rainfall Processes (SDExRain): A Decision Support Tool for Assessing the Climate Change Impacts on Local Rainfall Extremes, the 7th International Conferences on Water Resources and Environment Research (ICWRER), 5-9 June, 2016, Kyoto, Japan.
- Yeo, M-H., and Frei, A. (2018) A multivariate, stochastic approach to generating daily precipitation series at ungauged locations in mountainous region, the 18th Conference on Mountain Meteorology by American Meteorological Society (AMS), 25-29 June, 2018, Santa Fe, New Mexico, USA.
- Yeo, M-H., and Frei, A. (2018) Identification of homogeneous regions of daily precipitation based on the amount and occurrence of daily precipitation, the 10th International Conference on Urban Climate by American Meteorological Society (AMS), 6-10 August, 2018, New York, New York, USA.
- Yeo, M-H. (2018) A multivariate, stochastic approach to generating daily precipitation series at ungauged locations in Catskill Mountain region, New York City Watershed Science & Technical Conference, 12 September, 2018, Saugerties, New York, USA.