

Sohei Yamada

Urban Heat & Sustainability • Climate Risk Analytics • CFD & GIS

Urban climate researcher focused on mitigating extreme heat and advancing sustainability through rigorous quantification of climate risk. I integrate high-resolution CFD simulations with GIS, remote sensing, and data-driven methods to produce actionable insights that link urban form, infrastructure, and policy to resilient and equitable cities.

EDUCATION

New York University

Brooklyn, NY, USA

Urban Systems Ph.D. | Department of Civil and Urban Engineering

Expected May 2027

- GPA: 4.00, Urban Doctoral Fellow
- Developed a supercomputer-based urban digital twin and applied CFD simulations to quantify the spatiotemporal patterns of summer heat mitigation effects from a 0.5-hectare urban green space, showing cooling impacts persisting several hundred meters downwind.
- Combined remote sensing data and machine-learning models to reduce CFD computational costs, reproducing regional-scale climate fields (tens of km) at fine spatial resolution (tens of meters) and revealing spatial disparities in heat exposure across the Caribbean.

University of California, San Diego

La Jolla, CA, USA

Master of Public Policy, Environmental Policy | School of Global Policy and Strategy

June 2023

- Applied regression analysis, difference-in-differences, and randomized controlled trial (RCT) frameworks to demonstrate that investments in urban transportation infrastructure causally contribute to localized population growth and increases in regional GDP.
- Evaluated the necessity, design, and effectiveness of government interventions addressing environmental externalities, drawing on theoretical and empirical frameworks from environmental economics.

Waseda University

Tokyo, Japan

Master of Engineering, Energy Systems | School of Advanced Science and Engineering

March 2015

- Improved the numerical accuracy of CFD-based two-phase flow models describing liquid–vapor phase transitions of coolant water induced by nuclear fuel heat generation, contributing to enhanced safety assessment and thermal efficiency of nuclear power reactors.
- Received multiple distinctions from the Japan Society of Mechanical Engineers and the Atomic Energy Society of Japan, including Best Presentation Awards and a Fellowship, and graduated top of class (valedictorian).

Bachelor of Engineering, Applied Physics | School of Advanced Science and Engineering

March 2013

- Acquired advanced training in fluid mechanics and machine learning, together with the underlying mathematical foundations, including partial differential equations and vector calculus.

PROFESSIONAL EXPERIENCE

Ministry of the Environment

Tokyo, Japan

Data & Analytics Lead (Digital Transformation) | Nuclear Regulation Authority

August 2023 – August 2024

- Led over 40 operational improvement initiatives through the deployment of AI-based tools, VBA automation, and robotic process automation (RPA), and chaired cross-sectoral discussions with private IT firms on institutional barriers and solution pathways for operational reform within a national government agency.

Deputy Director | Nuclear Regulation Authority

April 2015 – August 2024

- Conducted extensive stakeholder engagement and policy advocacy with ruling and opposition legislators, inter-ministerial counterparts, media organizations, and local communities, resulting in revisions to nuclear and environmental policies informed by lessons from the Fukushima Daiichi nuclear accident.
- Engaged in formal deliberations with the International Atomic Energy Agency (IAEA) to contribute to the development and revision of international safety standards. Conducted technical safety reviews of nuclear power plants, evaluating

preparedness and mitigation measures for natural and human-induced hazards, including earthquakes, tsunamis, floods, tornadoes, fires, and volcanic eruptions.

Toshiba Corporation

Yokohama, Japan

Research Intern | Power and Industrial Systems R&D Center

August 2013 – September 2013

- Led the validation and verification (V&V) of a newly introduced computational fluid dynamics (CFD) software package and authored comprehensive technical documentation and user manuals to support institutional adoption and reproducibility.

TECHNICAL SKILLS

- *Urban Data Science*: vulnerability analysis, mitigation strategies, disaster recovery, emerging analytics, risk assessment
- *GIS & Remote Sensing*: ESRI ArcGIS, QGIS, Google Earth Engine, LiDAR, geospatial data management
- *Data & Programming*: Python (GeoPandas, Scikit-learn, TensorFlow, NumPy), R, STATA, C, deep learning
- *Modeling Tools*: ANSYS Fluent, OpenFOAM, physics-based and data-assisted simulation, mathematical modeling, predictive analytics, forecasting, climate modeling

SELECTED PROJECTS

Urban Climate, Heat Mitigation, and Environmental Monitoring

- Conducted a cost-benefit analysis of street-level versus rooftop greening strategies using GeoPandas and regression-based econometric models, quantifying cooling effectiveness and economic efficiency.
- Implemented fixed-point urban climate monitoring by integrating infrared thermography, in situ meteorological sensors, and satellite remote sensing to capture spatiotemporal thermal dynamics in urban environments.

Geospatial Modeling, GeoAI, and Urban Morphology

- Generated three-dimensional building models from point cloud data using QGIS, enabling high-resolution analysis of urban form and surface characteristics.
- Classified urban land-use patterns using GeoAI workflows in ArcGIS Pro, applying machine learning-based image classification techniques.

Climate Risk, Resilience, and Infrastructure Planning

- Performed hurricane risk assessments along the U.S. East Coast using BRAILS++ and R2D, integrating hazard, exposure, and building vulnerability data.
- Optimized the geographic placement of electric vehicle charging infrastructure in Tokyo using ArcPy, improving spatial coverage and accessibility through geospatial optimization.

Remote Sensing and Large-Scale Environmental Analysis

- Identified abandoned and degraded agricultural land in Japan through satellite time-series analysis using Google Earth Engine, leveraging vegetation indices and temporal change detection.

Data Visualization and Spatial Analytics

- Developed interactive visualizations of international trade intensity using Mapbox, enabling spatial exploration of bilateral trade flows and regional economic linkages.

Systems, Safety, and Accident Analysis

- Conducted a systematic causal analysis of the 2005 Amagasaki derailment, examining technical, organizational, and institutional factors contributing to the accident.

EXTRACURRICULAR ACTIVITIES

- Founded the ASPRS NYU Student Chapter and organized invited lectures by faculty specializing in remote sensing and geospatial science.
- Participated in post-disaster recovery efforts following the 2011 Great East Japan Earthquake, making two site visits to affected regions and contributing to the restoration of private residences and seafood processing facilities.