



Transforming Earth Observation (EO) Data into Building Infrastructure Data Sets for Disaster Risk Modeling

October 03, 05, & 10, 2023

10:00-12:00 (English) or 14:00-16:00 (Spanish) EDT (UTC-4)

Climate change is not only changing the location, frequency, and severity of environmental extremes and hazards, but also the baseline spatial and temporal patterns that have served as the basis for land use planning, the design of infrastructure, and the development of construction standards and practices. To anticipate the emerging impacts on communities, we must improve understanding of exposed assets, including the built infrastructure and its characteristics such as structure type, use, occupancy, compliance with engineering standards, and replacement cost. GIS databases track exposure on a wide variety of scales, formats, and levels of detail, yet aggregating these data for risk assessment typically results in skewed datasets that present a view of risk that is limited to known assets. In this short course, we will cover the basics of natural hazard risk modeling and exposure development with a focus on fusing data from multiple datasets expressly for the purposes of risk assessment. We will also present examples applying the techniques to applications related to flood risk assessment, climate adaptation, and earthquake modeling.

Part 1: Development of Regional Exposure Data with Earth Observations

- What is exposure data, and how is it used in the loss estimation process?
- The basic process of developing exposure data
- Structural mapping scheme development and building sampling
- Case Study: walkthrough of building exposure data for Tunisia

Part 2: Development of Site-specific Exposure Data with Earth Observations

- Developing a building-level exposure data set for HAZUS Flood Study in New York
- Using Earth Observations to develop a building structures dataset
- Case study: Sampling from streetview to characterize vulnerability

Part 3: Assessing Utility and Communicating Uncertainty

- Exposure data best practices
- Developing and understanding metadata
- Equity and bias considerations
- Case study: Assessing climate change impacts with building exposure data in Antigua and Barbuda



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