

# SEISMIC HAZARD & RISK

## Assessment for Urban Areas



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**Urban areas in seismically active regions are under the risk of earthquake-induced damage and loss.**

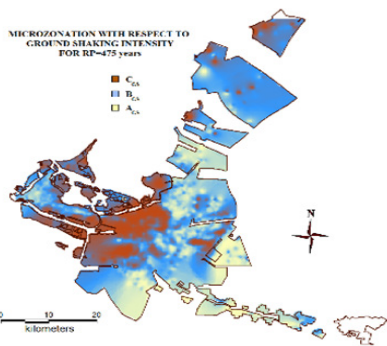
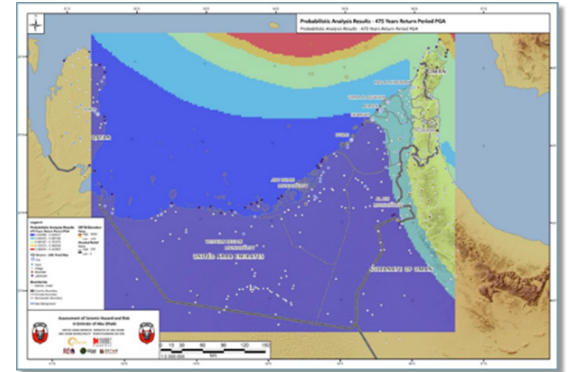
We provide state-of-the-art quantification of seismic hazard and risk, which is essential for developing effective mitigation and management actions to improve the resiliency.

- Prepare and plan for earthquake disaster response, management, and mitigation actions.
- Develop urban planning and land use management to improve seismic resiliency.
- Anticipate the impact of earthquakes and develop the appropriate design, retrofit, and repair approaches.
- Quantify earthquake-related risk and make reliable estimations of potential economic losses.

# Seismic Hazard & Risk Assessment

## SEISMIC HAZARD ANALYSIS

We perform probabilistic and deterministic seismic hazard analyses complete with source characterization, ground motion predictive models, and quantification of uncertainties involved to provide the estimation of earthquake-induced ground motions and ground motion parameters at a given location.



## MICROZONATION FOR GROUND SHAKING, LIQUEFACTION & LANDSLIDE POTENTIALS

We conduct a site investigation and subsequent site-specific response analysis for modeling the effects of local soil conditions on the ground response and perform state-of-the-art susceptibility analyses to evaluate earthquake-induced landslide and liquefaction hazards to provide urban-scale microzonation maps showing the spatial distribution of site amplification, liquefaction and landslide potentials for a given area.

## VULNERABILITY & LOSS ESTIMATION FOR BUILDINGS & CRITICAL INFRASTRUCTURE

We identify an inventory of buildings, lifelines, and facilities using high-end technology and state-of-the-art methods and develop seismic fragility models to assess vulnerability of the built environment to the quantified exposure. We develop realistic loss estimation models to provide distribution maps of potential damages. We also offer cost analyses for repair, retrofit, and downtime before and after an earthquake.



## SEISMIC DATABASE & GIS SHELL FOR MANAGEMENT AND MAINTENANCE

We develop and implement multifunctional GIS-based Interactive Maps and Seismic Design Parameters Web to enable share & usage of all products and data by designers, planners, and emergency managers.



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