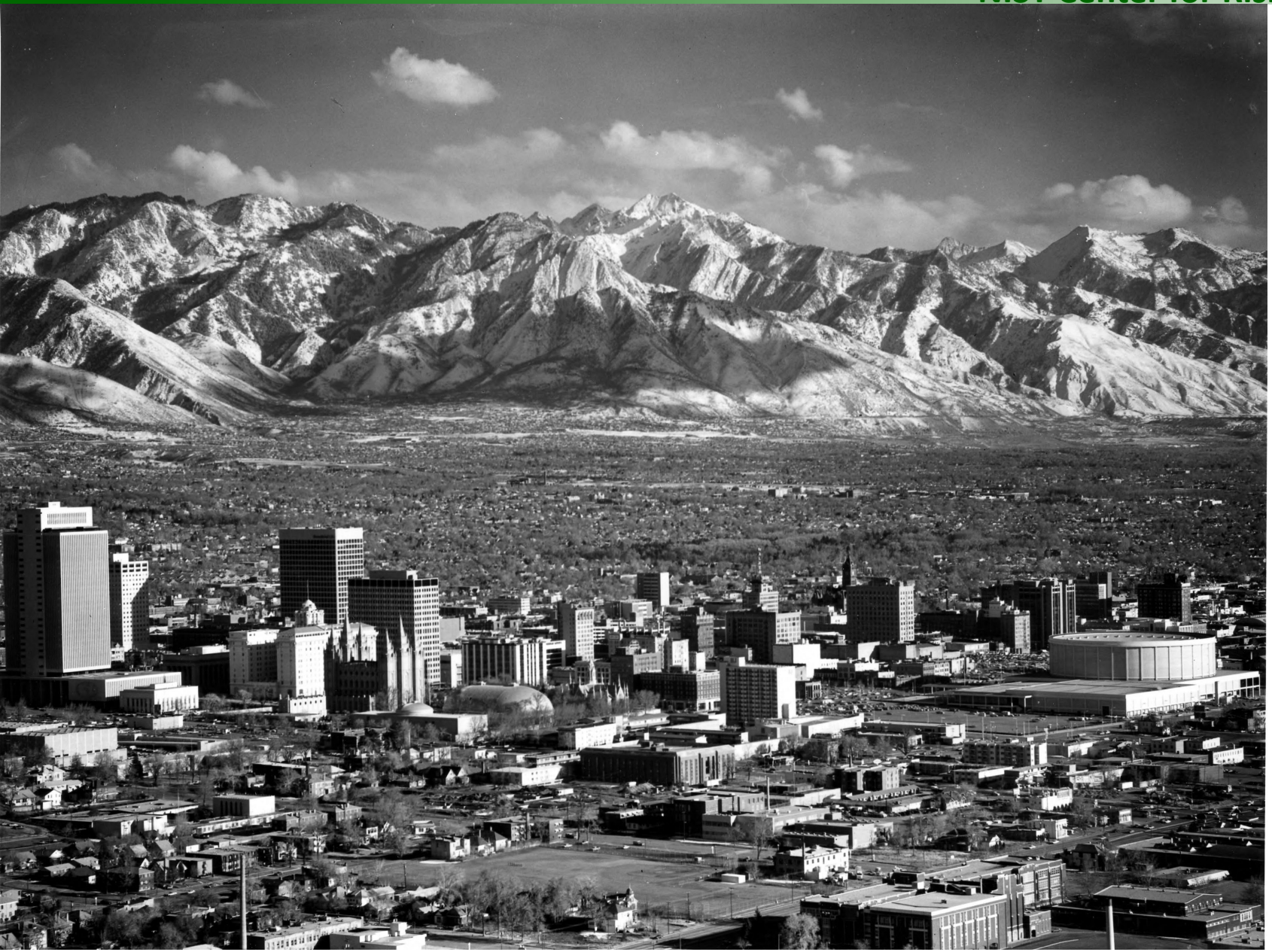
Wasatch Cascading Event Scenario

Steven P. French, PhD., FAICP
Professor of City and Regional Planning
Georgia Institute of Technology
Atlanta, GA 30332-0155

NASEM Workshop for Compounding and Cascading Hazards
May 31, 2022

7.3R magnitude earthquake occurs on the Wasatch Fault



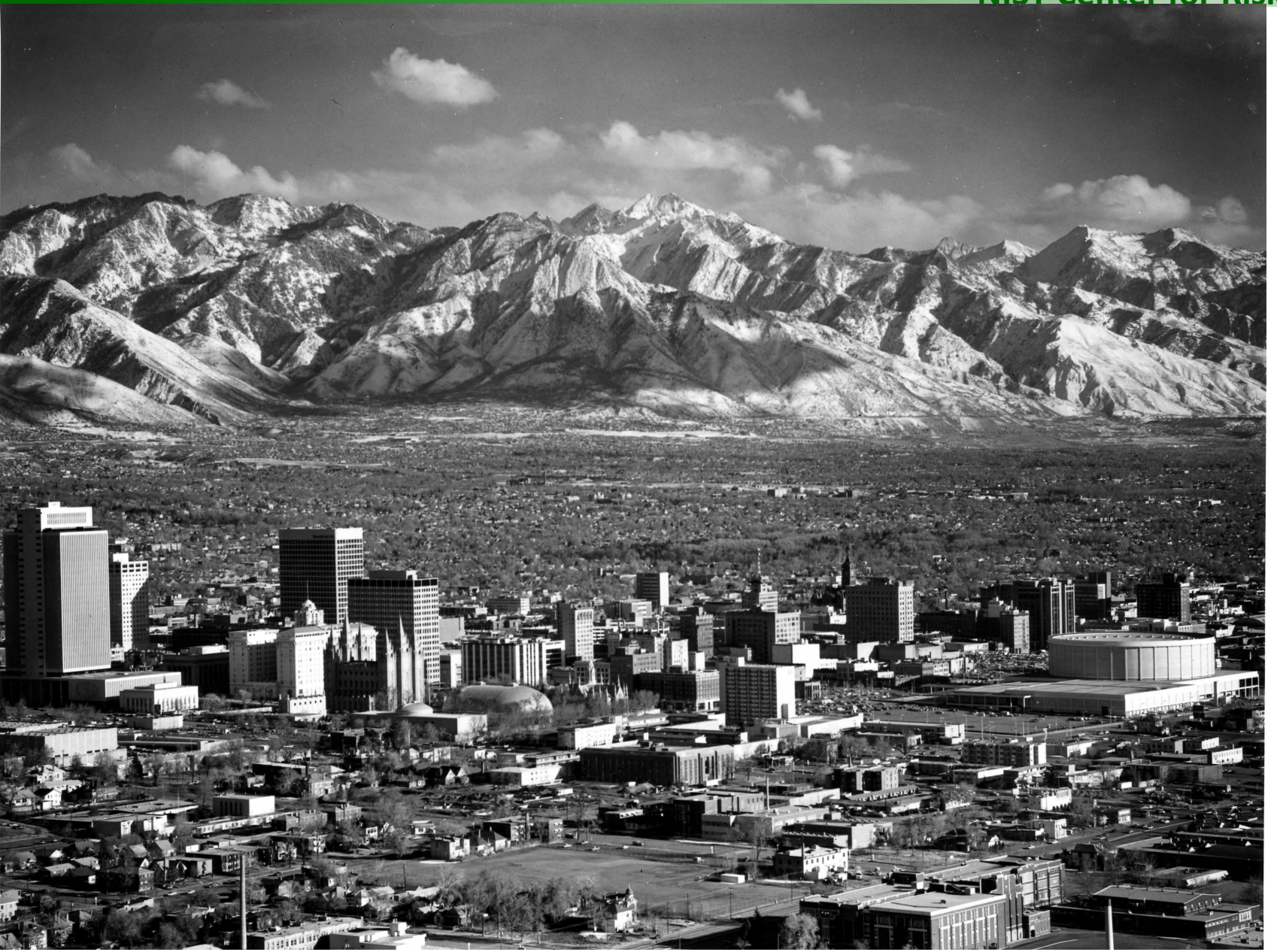
7.3R magnitude earthquake occurs on the Wasatch Fault

<u>Geology</u>

Ruptures on several of the lateral lateral faults under Salt Lake City and surrounding communities

Numerous landslides in the mountains

Liquefaction of the airport and surrounding areas



7.3R magnitude earthquake occurs on the Wasatch Fault

Built Environment

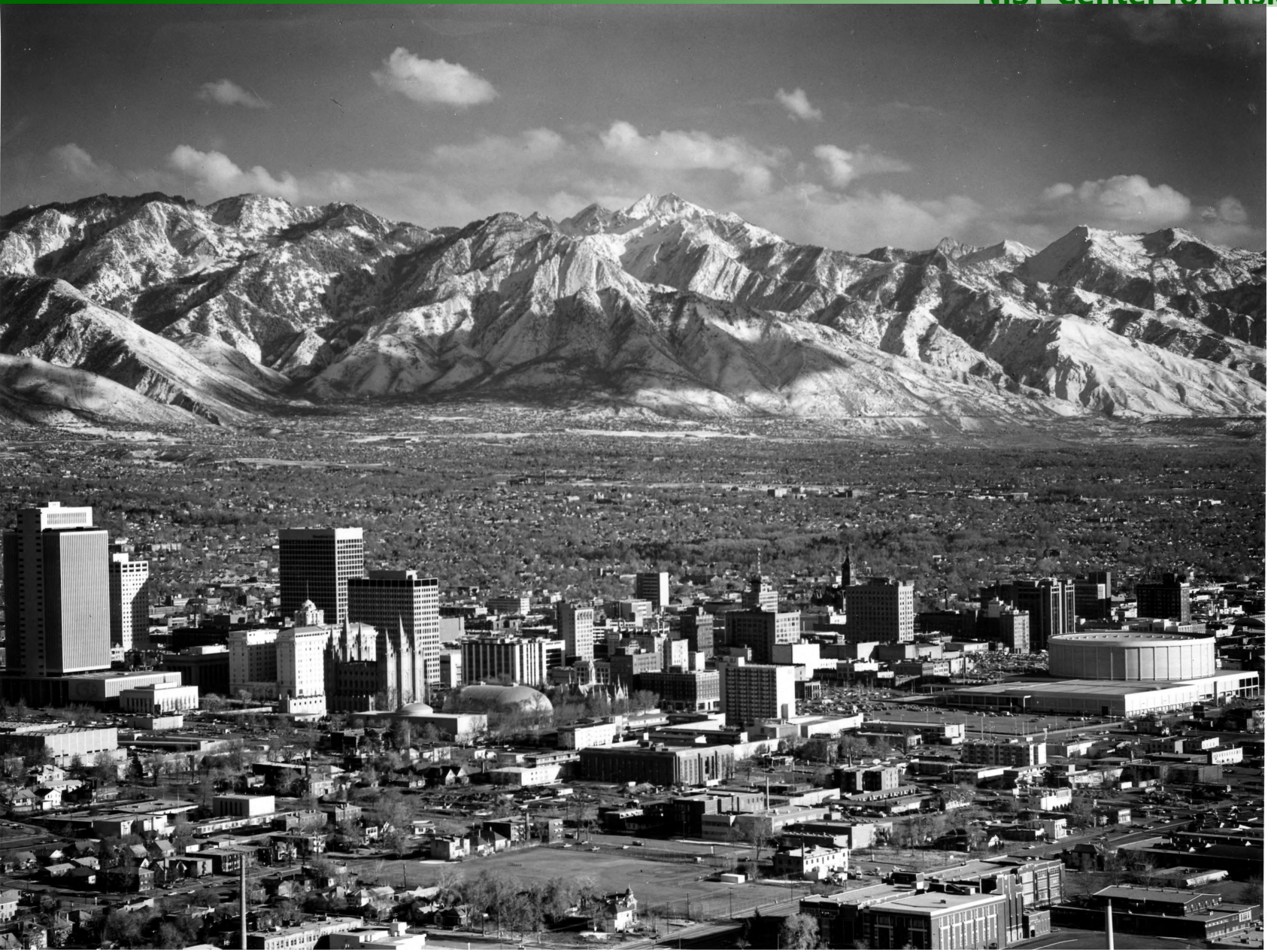
Much of the URM building stock is severely damaged

Masonry and steel buildings perform worse than expected

Natural gas, electric power, water and sewer systems are damaged

Several highway interchanges are severely damaged

Airport is closed



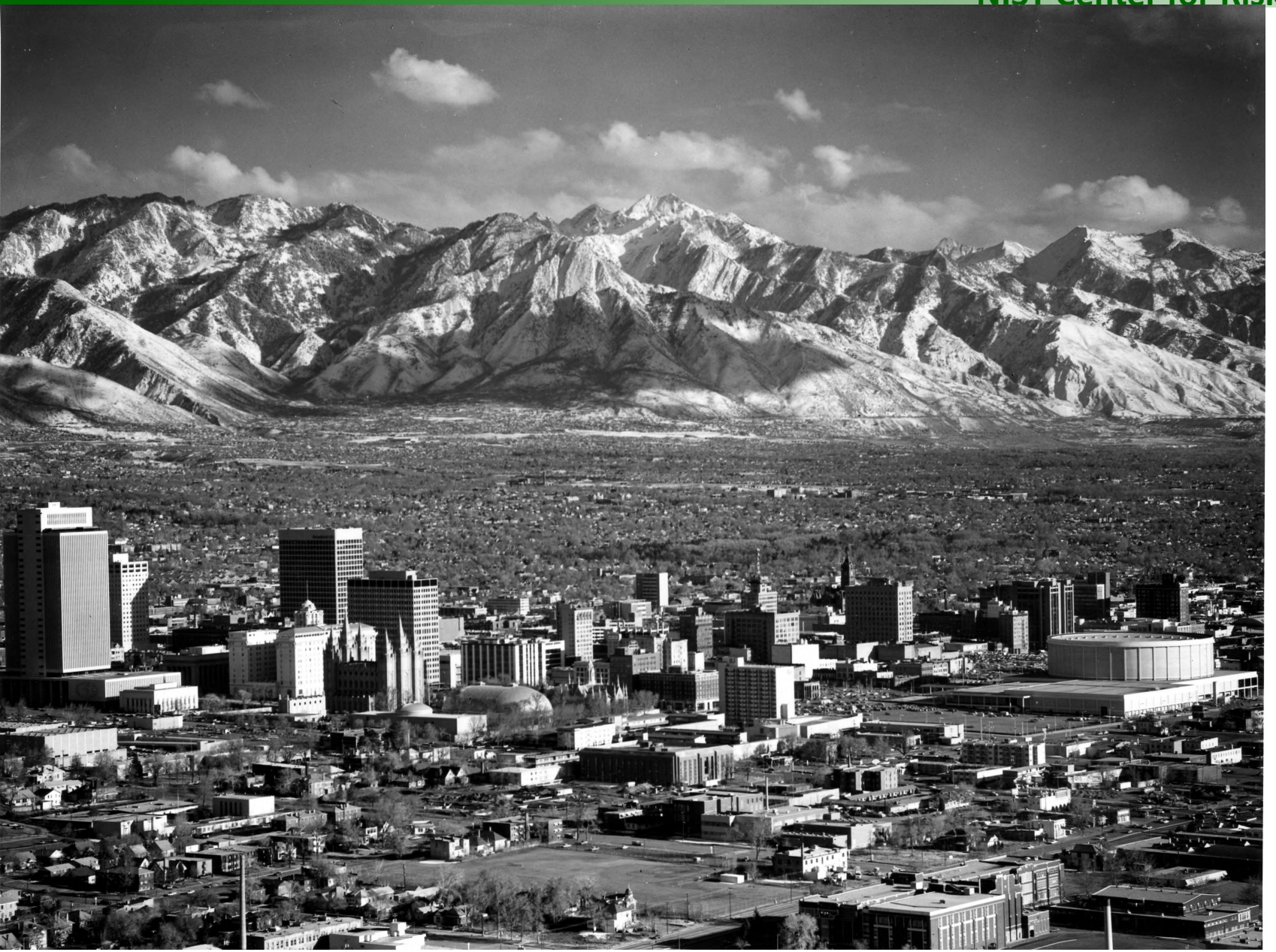
7.3R magnitude earthquake occurs on the Wasatch Fault

Fire Ignition

Numerous fires break out around damaged gas and electric facilities

Response is hampered by damage to the transportation network

Fires spread to the eastern hillsides



7.3R magnitude earthquake occurs on the Wasatch Fault

Social Impacts

Hundreds of households are displaced, especially lower-income households

Gas and diesel supplies run short

Employees cannot get to work across much of the region

The supply chain for manufacturing firms is disrupted

Governance Issues

How do we coordinate the 2 counties, 49 cities, numerous municipal service districts, multiple private power companies, state and federal agencies and private stakeholders with different goals, economic incentives, time horizons, risk tolerances and administrative capacity to

Plan

Mitigate and

Respond

to such a cascading event.

Applied Research Needs

Test incentives for coordination – Interagency and public/private

Impact of state mandates for hazard mitigation and response planning

Value of local and regional scenario-based emergency response exercises

Models of local and regional hazard resilience planning

References

Raymond J. Burby et al., 1999. Unleashing the Power of Planning to Create Disaster-Resistant Communities. *Journal of the American Planning Association*. 65:3 (Summer).

Steven P. French. 2012. Modeling Nonstructural Damage for Metropolitan Building Stocks. *Proceedings of the Fifteenth World Congress on Earthquake Engineering*. Sept. 30-October 6, 2012, Lisbon, Portugal.

Thank You

steve.french@design.gatech.edu