

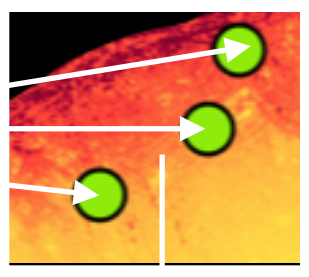
Earthquake & Tsunami Models | Apps | Insight for empowering cat modelers



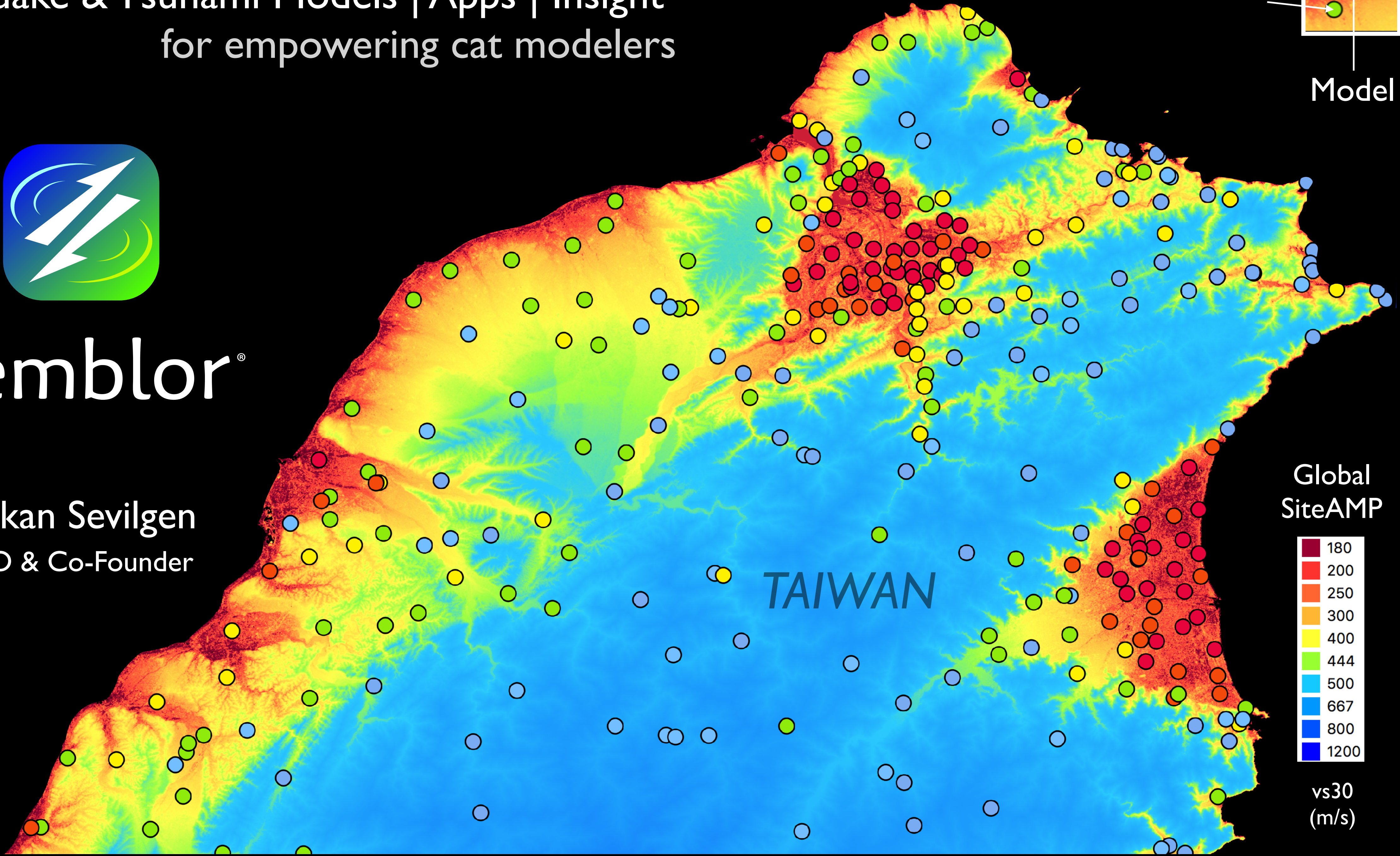
temblor®

Volkan Sevilgen
CTO & Co-Founder

Measurements



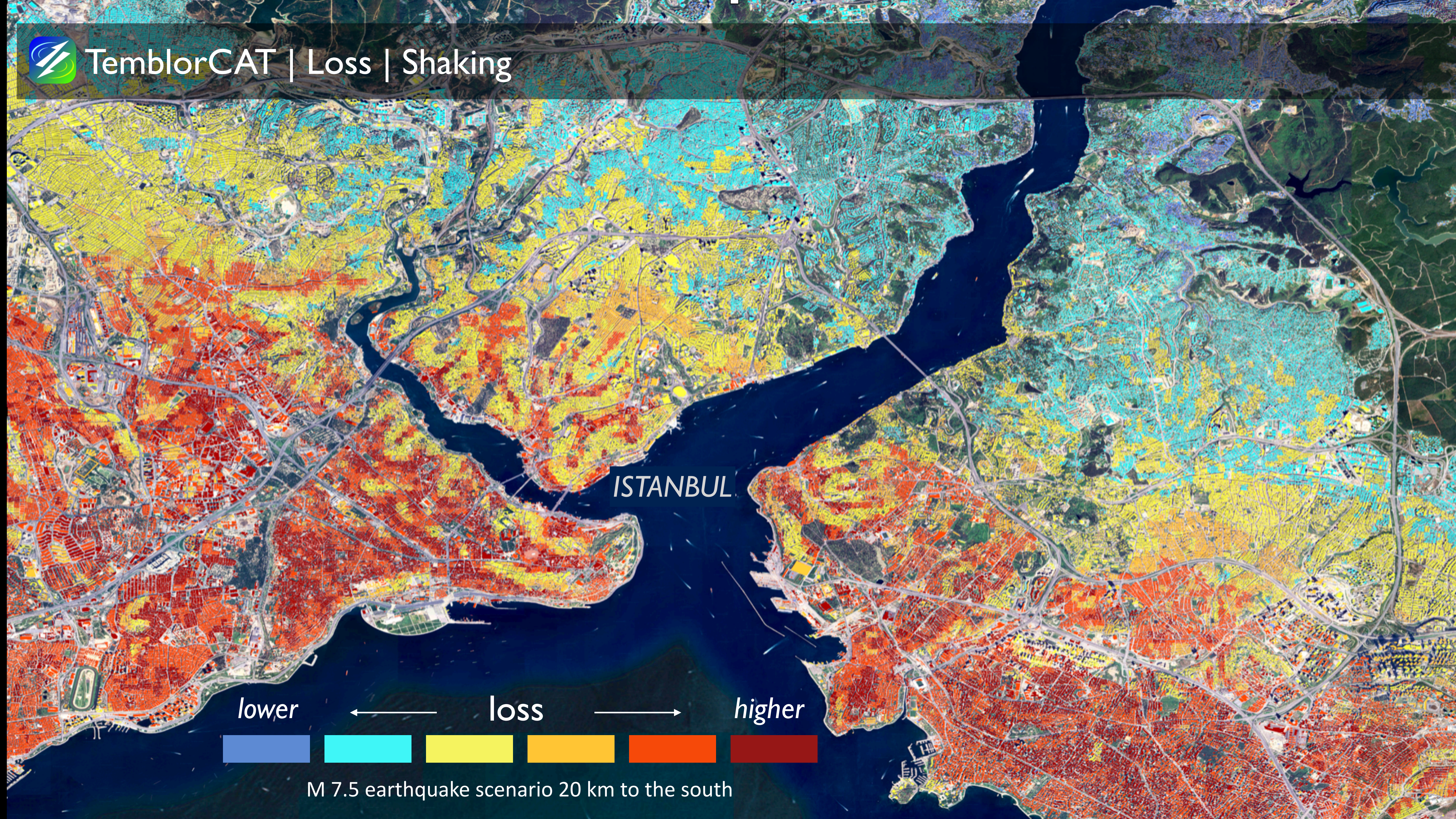
Model



Global
SiteAMP



vs30
(m/s)



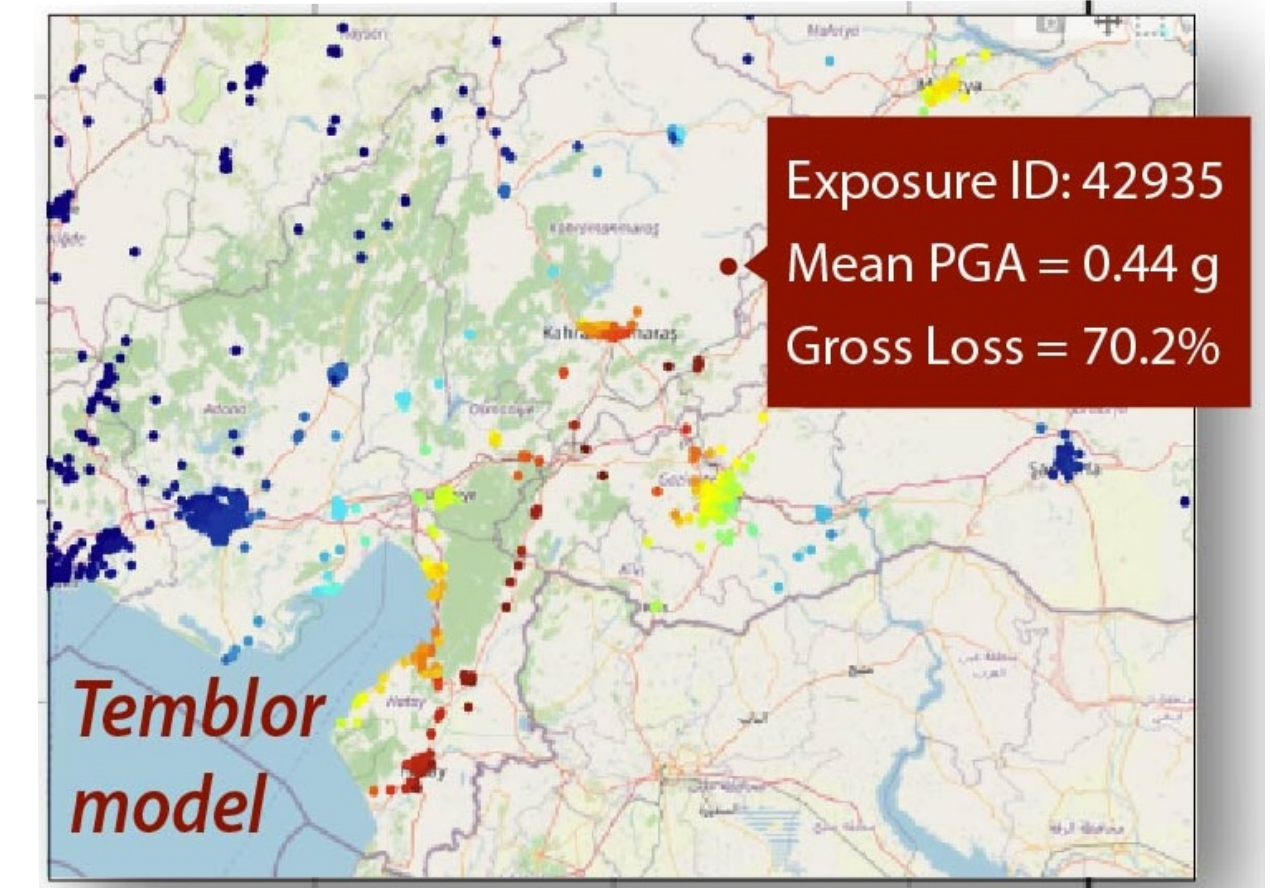
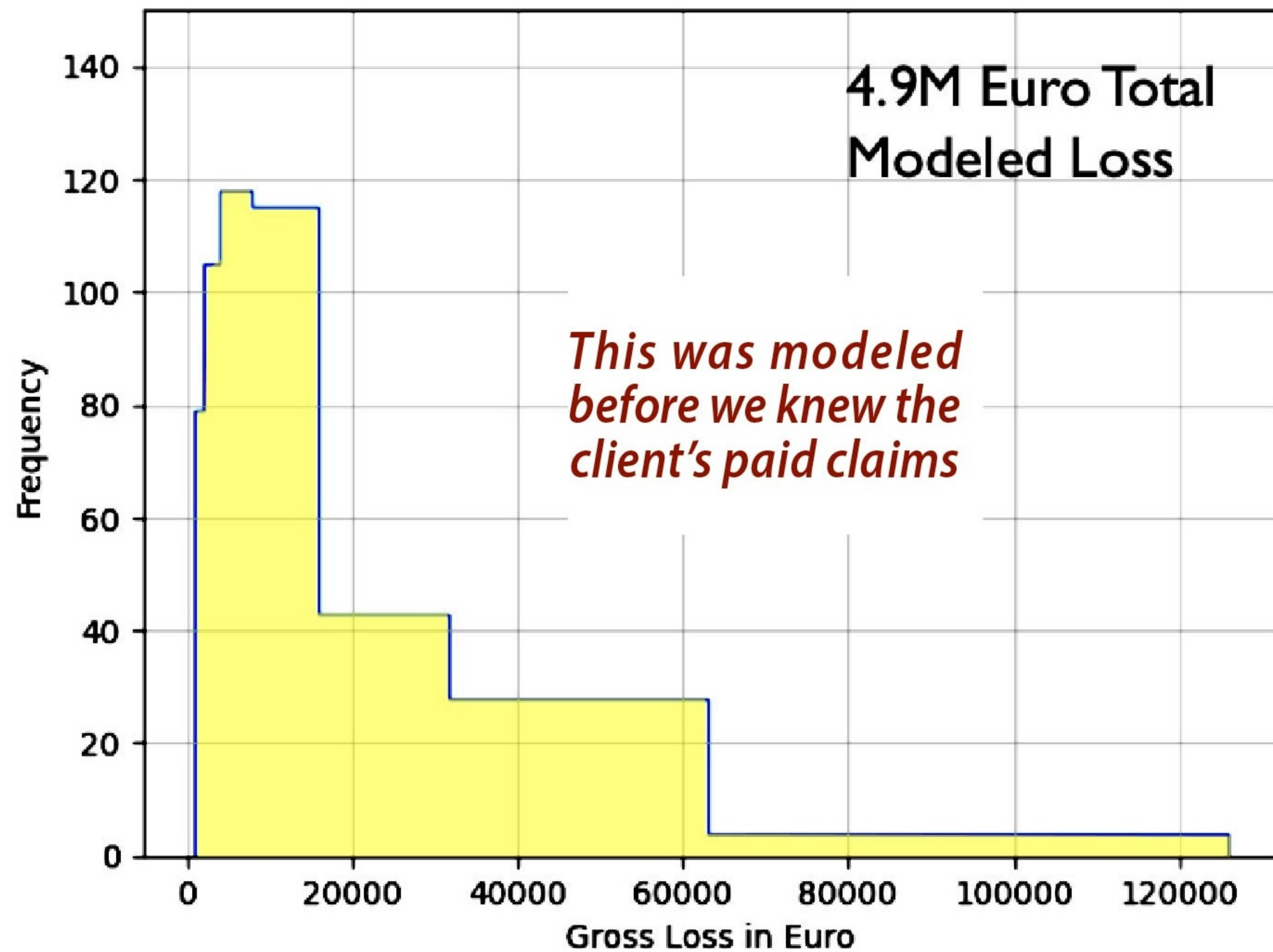
ISTANBUL



M 7.5 earthquake scenario 20 km to the south

The 2023 Kahramanmaras earthquakes provide a test of Temblor loss footprints

Temblor modeled 2023 M 7.8 + M 7.7 Turkey residential losses





Building fragilities in Temblor Loss Models (based on HAZUS and ATC-13)

Material:	Wood	Steel	Concrete	Masonry	Precast	Mobile
Lateral System: Moment Frame	W	S	C	M	PC	MH
Braced Frame		S	C			
Shear Wall			C			
Bearing Wall		S	C	M		
Infill Frame		S	C			
Light Frame						
Tilt-Up	W	C	C	M	PC	MH

Height classes

Low-rise 1-3 Mid-rise 4-7 High-rise 8+

Design level color chips

- Pre-Code
- Low-Code
- Moderate-Code
- High-Code

"Example HAZUS MBT labels: W1 W2 S1L/M/H S2L/M/H S3 S5L/M/H C1L/M/H C2L/M/H C3L/M/H PC1 PC2L/M/H RM1L RM2L/M/H URML/URMM MH



Transportation structure fragilities in Temblor Loss Models

Bridges & Structures



Highway Bridges
(Class 24-30)



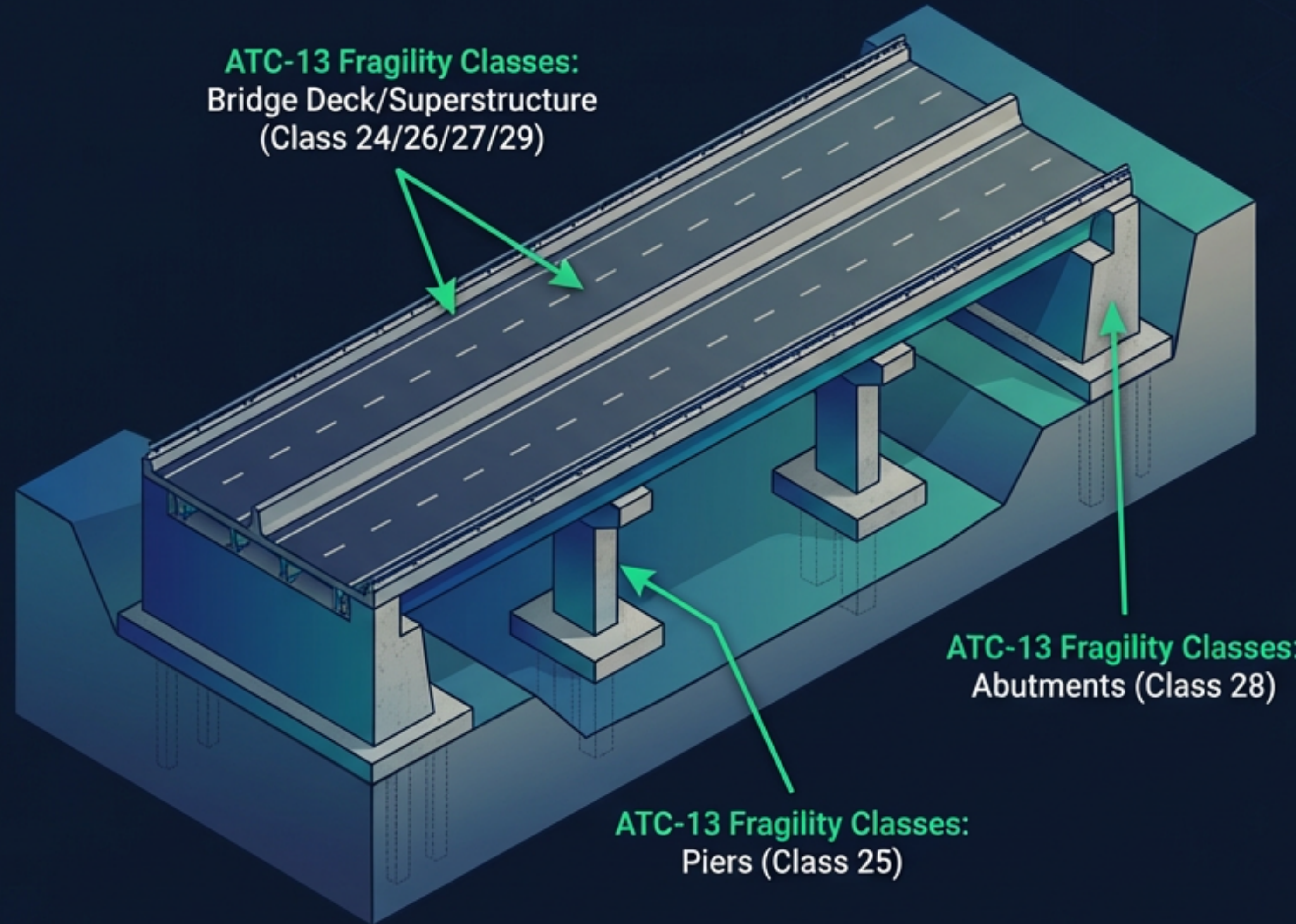
Railway Bridges
(Class 29/30)



Tunnels
(Class 31)



Overpasses
(Class 26/27)



Roadways & Pavements



Major Highways
(Class 31/32)



Local Roads
(Class 33/34)



Embankments
(Class 34)

Modeled using ATC-13 Facility Classes 24-30 (Bridges) and 31-34 (Roads/Tunnels)



Utility and Lifeline fragilities in Temblor Loss Models

Electric Power



- generation plants
- substations
- transmission towers/lines
- distribution networks

Water & Wastewater



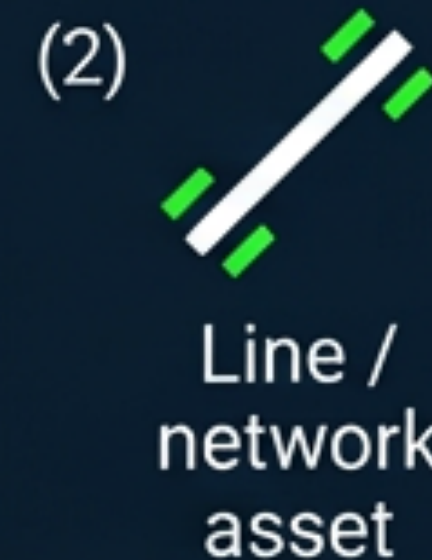
- treatment plants
- pump stations
- storage tanks
- pipelines

Natural Gas & Liquid Fuels



- compressor stations
- distribution mains
- storage tanks

Legend



Apply component-specific fragilities

Telecommunications



- central offices
- cell towers
- fiber routes

Transportation Interfaces



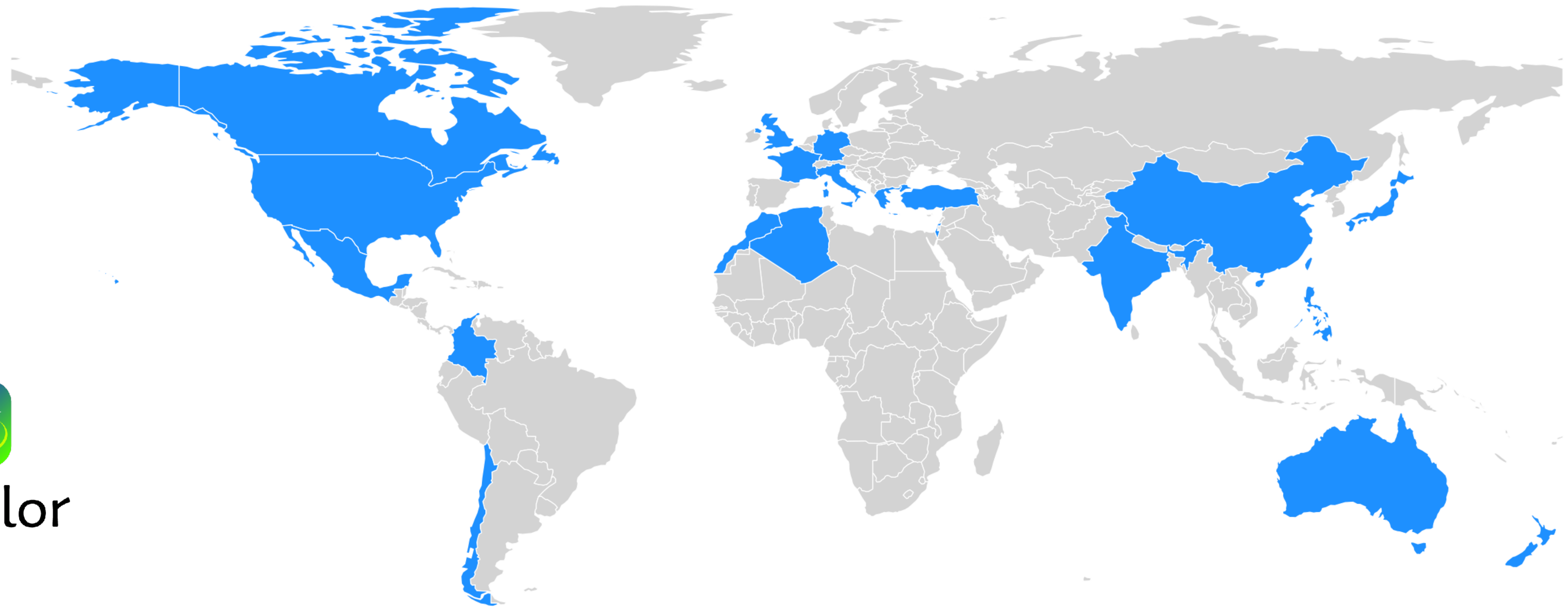
- ports
- airports
- fuel systems
- rail yards (as lifeline nodes)

Emergency & Public Services Dependencies



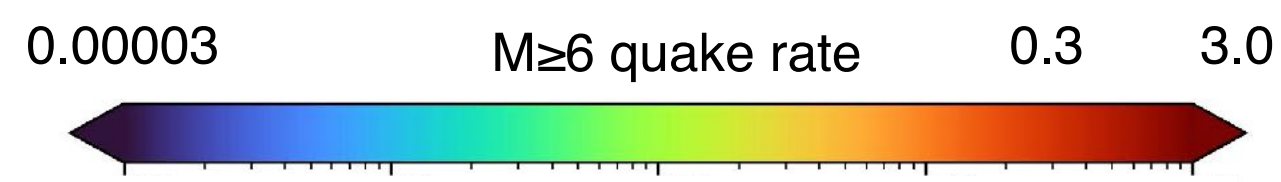
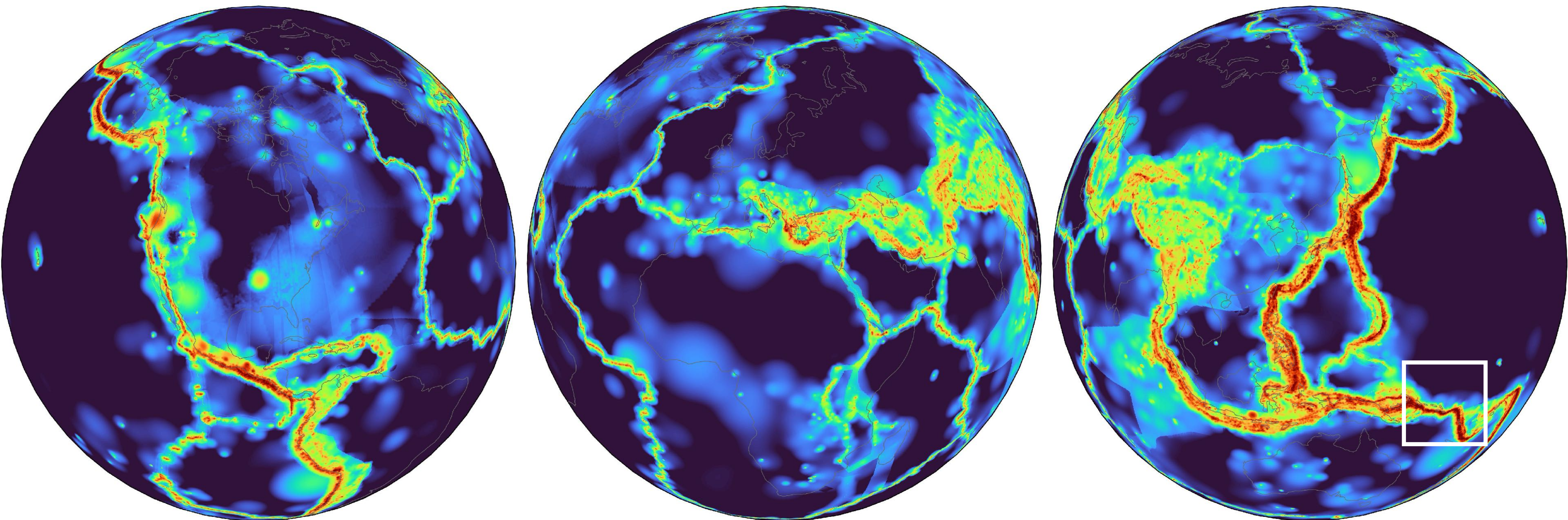
- hospitals
- power backup
- EOCs comms
- shelters water

Loss models for twenty countries to be released in May via OASIS & Verisk Model Exchange



United States, Canada, Mexico, Australia, New Zealand, Taiwan, Japan, United Kingdom, Turkey, Greece, Israel, Germany, France, Italy, Chile, Colombia, Morocco, Algeria, India, China,

EventSet, a 50,000-yr $M \geq 5$ globally consistent stochastic event set



No mosaicking, no local judgment, no regional biases

Under independent test for 10 years

Successful parametric earthquake and tsunami covers for the World Bank and Pacific Catastrophe Risk Insurance Company



2024 M 7.4 Vanuatu earthquake damage



2025 M 8.8 Kamchatka tsunami damage

Clients

Willis Towers Watson



FERMAT CAPITAL MANAGEMENT

howden

NEUBERGER

BERMAN



QBE



WORLD BANK GROUP



GuyCarpenter



Gallagher Re

Doğa
sigorta

SIMPSON

Strong-Tie



PACIFIC
CATASTROPHE
RISK INSURANCE
COMPANY

insurity



\$1.7M National Science Foundation award
for Small Business Innovation Research