

# Earthquake risk & Reinsurance

## I. International Istanbul Insurance Conference

Michael Spranger

Istanbul

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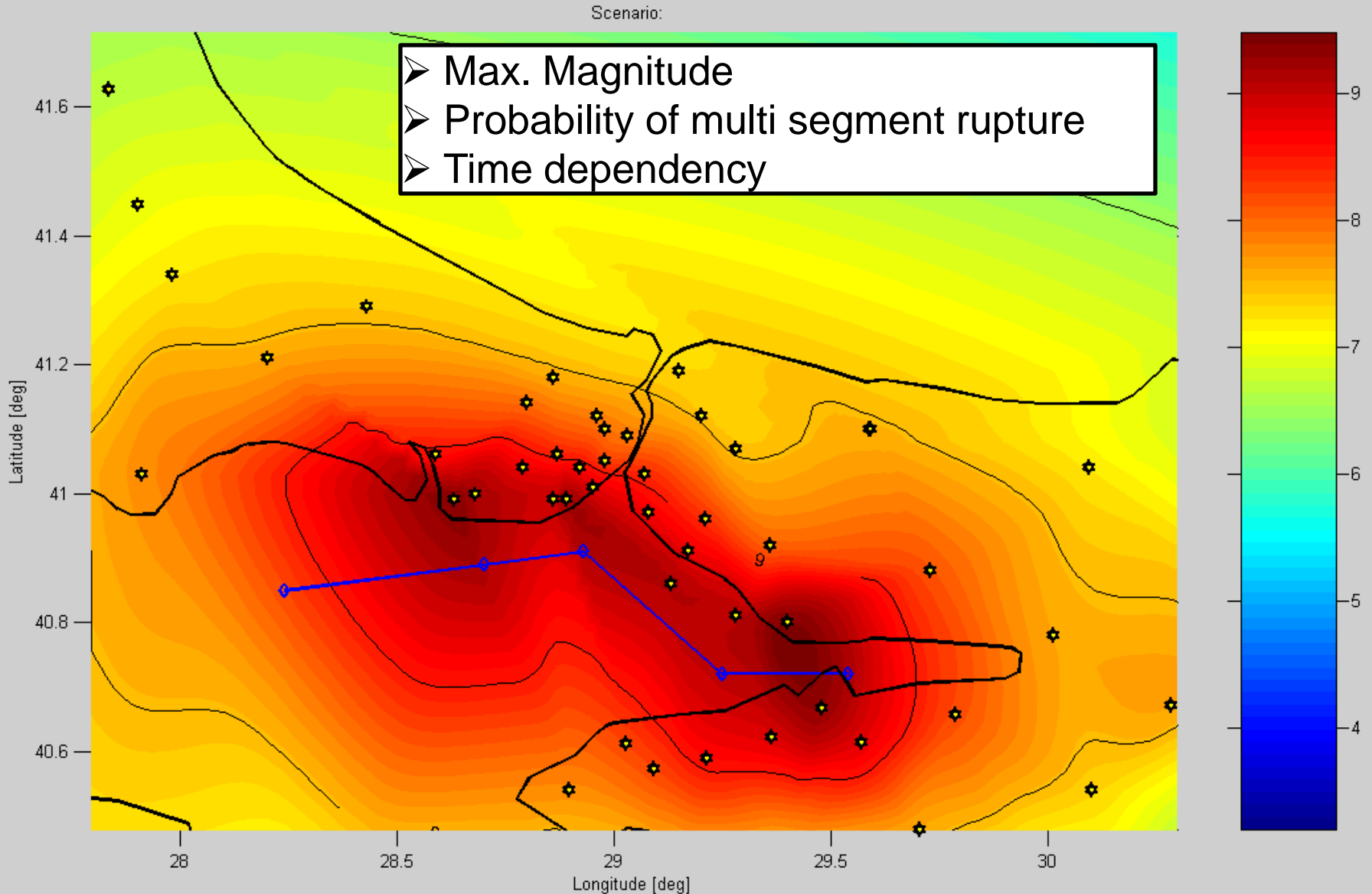
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# Uncertainties in Risk Modelling

- Event (probability, location, size)
- Intensity (attenuation, directivity)
- Local influence (amplification, frequency, liquefaction)
- Secondary uncertainty (fire following, induced landslide)
- Vulnerability functions (average damage, distribution)
- Exposure information (building quality, location)
- Loss (claims handling, demand surge, political pressure, fraud)
- Handling errors
- ...

# Istanbul Worst Case



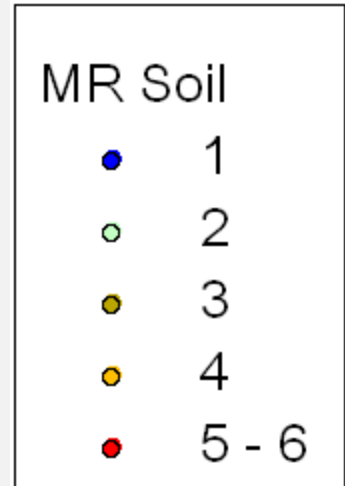
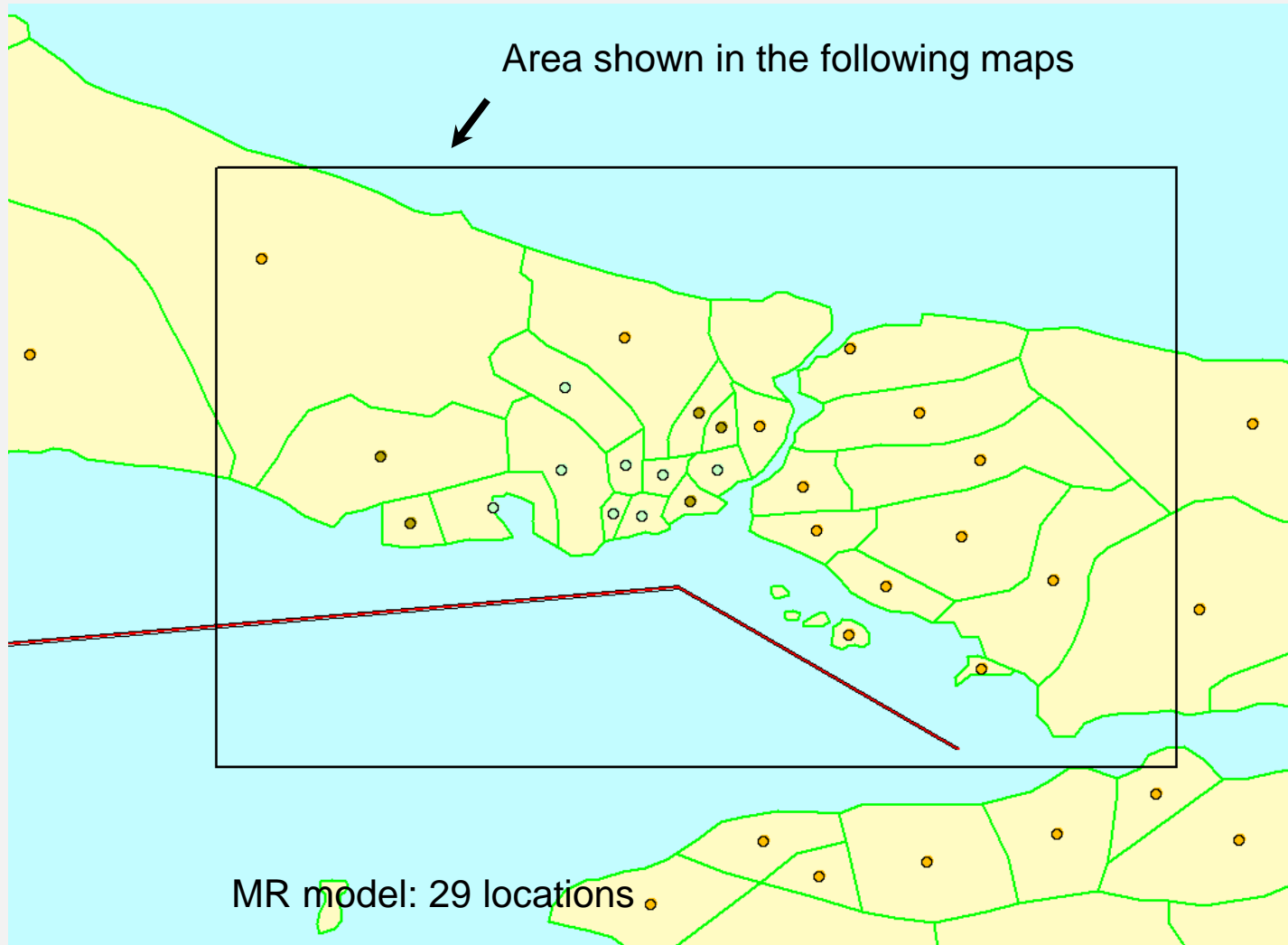
# Data quality I: spatial resolution

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# Data quality I: spatial resolution

## Lesson from LessLoss project



# Data quality I: spatial resolution

## Lesson from LessLoss project

KOERI model: 8131 locations



Iccler seems to be sufficient for EQ, but...

# Data quality II: reporting standards

Cresta Zone	City	District	Policy Count	Total Sum Insured
1	İSTANBUL	MERKEZ	10	10000
2	EDİRNE	MERKEZ	10	10000
2	KIRKLARELİ	MERKEZ	10	10000
2	TEKİRDAĞ	MERKEZ	10	10000
3	KOCAELİ	MERKEZ	10	10000
3	SAKARYA	MERKEZ	10	10000
3	YALOVA	MERKEZ	10	10000
4	BALIKESİR	MERKEZ	10	10000
4	BİLECİK	MERKEZ	10	10000
4	BURSA	MERKEZ	10	10000
4	ÇANAKKALE	MERKEZ	10	10000
5	AYDIN	MERKEZ	10	10000

Is this all you know  
about these risks?

Many special characters

No official name for İlçe

**Un-necessary, error-prone & time consuming (manual) adjustments:  
Please use numeric code!**



# Modelling Surprises

- 1994 Northridge: A disaster for modelers
- 1995 Kobe: Unforeseen and unexpected big economic losses
- 1999 Turkey: Expected and fairly well estimated
- 1999 Athens: Unexpected event
- 1999 Taiwan: Unlikely event with surprising BI losses
- 2001 Seattle: Expected event, slightly overestimated losses.
- 2004 Niigata: Surprisingly high economic losses
- 2004 Indonesia: Surprisingly high magnitude, tsunami
- 2005 Kathrina: Expected event with unforeseen consequences
- 2006 Offshore West Java: surprisingly high tsunami
- 2007 Niigata: again? Safety of nuclear power plants
- 2008 China snow event
- 2008 Wenchuan EQ: Exposure information, coverage
- 2009 ????????????



- How do you deal with these model uncertainties?
- Is the current EQ tariff sufficient – even to subsidize fire risks?
- Ten years after the Izmit EQ:
  - Is it time to soften the conditions of the EQ tariff?

**Thank you very much for your attention.**

Michael Spranger



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