• About ICF
• Recent Natural Hazards
• Risk Model (Hazard model)
• Vulnerability Model
• Conclusion
Development of the Icelandic Cat Fund

- Formed by Act of Parliament after the 1973 Vestman Iceland incident to cover all catastrophe perils except Windstorm
- First purchased reinsurance in 1976 from London Market and is one of Guy Carpenter’s oldest clients
- Reinsurance strategy is to buy high level reinsurance
- Only one ever reinsurance claim in 2008.
Profit and loss to reinsures since 2000

- **Premium ISK 3,360,000,000**  
  (USD 28,573,858)

- **Claim ISK 3,081,000,000**  
  (USD 26,201,207)

- **Overall reinsurer profit ISK 279,000,000**  
  (USD 2,372,650)
Deductibles from 2000 to 2011

**Deductible 2011**
10,000,000,000
(USD 86.775.000)

**Deductible 2008**
6,500,000,000
(USD 56.400.000)
Important Changes to the Icelandic Catastrophe Fund

• Formalizing and documenting external and internal procedures

• Committee was appointed by The Prime Minister‘s office (PMO)
  – To evaluate all departments and agencies that can possibly be affected by natural hazards in Iceland
  – Includes Guy Carpenter
  – Has already resulted in a more professional and coordinated response to natural hazards.

• Committee to revise the legislation for the CAT fund
  – Appointed by the Minister of Economic Affairs
  – Charged with rewriting the Icelandic catastrophe laws to improve efficiency and understanding of the coverage provided
Important Improvements of the Act

• Specific catastrophe footprint will be introduced
  – To be determined by independent scientific advisors
  – Outside this area the onus for proving the validity of the claim will be on the claimant

• Deadline for presenting claim reduced

• Claims payment must be used to repair the building
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On March 20th, 2010, an eruption of the Eyjafjallajökull volcano began in Fimmvörðuháls following months of small earthquakes under the Eyjafjallajökull glacier.
In April 2010 this was followed by a larger eruption on Eyjafjallajökull itself, and there are fears that this will trigger a much bigger eruption of nearby Katla.
Grímsvötn, 1996 it closed Road 1 in Iceland for few days with rocks and ice - no ash at this time
Grímsvötn 2004, small eruptions – no ash and no floods
Grímsvötn, 2011, no floods but a lot of ash in south east of Iceland
Losses from these volcanic eruptions in the years 2010 and 2011

Eyjafjallajökull total loss less than 6 m US $

Grímsvötn total loss less than 6 m US $

Total loss in each event less than 7% of the ICF’s deductibles
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Catastrophe Response
Modules and project participants

Hazard

Exposure

Vulnerability

RISK

Scott Steedman & Mohammad Zolfaghari
Historic Earthquake Record (Hazard)
Computer Simulated Earthquake Hazard

Seismic Moment Generated by Simulated Earthquakes for 310 years
Source Model 1
• About ICF
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EXPOSURE
Property registry database

• High quality exposure information about all insured buildings

• Nominated by IAAO in 2011 (The International Association of Assessing Officers)

• 250,000 building items in Iceland

• GPS coordinates

• Insurance/replacement value

• Type of use

• Construction year

• No. floors and \( m^2 \)

• Material
Iceland Portfolio
Earthquake 2008
Damage overview

- About 12,800 buildings in western part
- 67% undamaged
Earthquake 2008
Damage overview

Earthquake in South Iceland 2008
Reported damage on buildings.

Selfoss
Damage %
- 0 - 10 %
- 10 - 20 %
- 20 % <
EXPOSURE
Building classification

• All buildings in the Property Registry database are classified
• 19 classes with regard to earthquake vulnerability

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<td>All</td>
</tr>
</tbody>
</table>
DAMAGE AND LOSS Database

- All damaged buildings surveyed by trained engineers
- Damage/loss assessment recorded in a comprehensive data base
- No liquefaction or landslide
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Analytical Outputs

e.g. Loss curves
Modelling Conclusions

- Bespoke full probabilistic model
- Hazard module using state-of-the-art techniques
- Includes full integration of local scientific knowledge, peer reviewed by University of Iceland
- Detailed vulnerability functions based on recent experience and local engineering understanding and expertise.
- Fully geocoded and classified portfolio. 1 to 1 match of risks to vulnerability functions
- 100% of the market portfolio. No need for disaggregation or estimation.
Modelling Conclusions

• The greatest benefit for the Icelandic Cat Fund is that now we have a unique model which gives us true information, based on previous events, hopefully resulting in more reasonable premium on the cover for our highest risk factor, earthquakes.

• This does as well give us the opportunity to inform our reinsurance companies about expected total cost in a earthquake event immediately.