Extreme Weather & Climate Events – a view from the insurance industry

Christopher Genillard
Brussels, 6th of June 2018
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Natural Catastrophe Losses in 2017

Table 1: Total economic and insured losses in 2017 and 2016

USD billion (in 2017 prices)

<table>
<thead>
<tr>
<th></th>
<th>2017</th>
<th>2016</th>
<th>annual change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic losses (total)</td>
<td>306</td>
<td>188</td>
<td>63%</td>
</tr>
<tr>
<td>Nat cat</td>
<td>300</td>
<td>178</td>
<td>69%</td>
</tr>
<tr>
<td>Man-made</td>
<td>6</td>
<td>10</td>
<td>-42%</td>
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<tr>
<td>Insured losses (total)</td>
<td>136</td>
<td>65</td>
<td>110%</td>
</tr>
<tr>
<td>Nat cat</td>
<td>131</td>
<td>56</td>
<td>133%</td>
</tr>
<tr>
<td>Man-made</td>
<td>5</td>
<td>8</td>
<td>-45%</td>
</tr>
</tbody>
</table>

Source: Swiss Re Institute

Calamity pain
Worldwide catastrophe losses
2016 prices, $bn

Source: Munich Re
Natural Catastrophe Losses in 2017

Widespread damage in the US, Europe and Asia

- USA: Large-scale hurricanes "Harvey", "Irma" and "Maria" accompanied by heavy rain and floods in August and September. Economic losses USD 265 billion; Insured losses US$ 93 billion. 300% differential in estimate of insured loss on the part of commercial model vendors!

- Forest Fires in California, Portugal & other European countries

- Europe: Spring frost brought US$ 3.6bn damage to European farmers (only 18% insured). Storms "Xavier" and "Herwart" in October caused insured losses of EUR 200 million and 250 million

- Asia: Exceptionally powerful monsoon in Southern Asia in August caused an economic loss of US$ 3.5bn and death of 2,670 people
CLOSING THE NATURAL CATASTROPHE PROTECTION GAP

Definition and measurement of the protection gap: globally 30% of economic losses are insured

Underinsurance of property and agriculture risks is a global challenge

Increased economic development drives insurance penetration... affordability for the poor

The protection gap is widening: urbanization, value accumulation & concentration, climate change

Governments will normally foot the bill for their uninsured voters or farmers

Cooperation between insurance industry & government for Intelligent mapping, risk zoning & risk modelling?

Subsidized compulsory public-private insurance schemes to diversify the risk community & eliminate adverse selection?
Impact of Climate Change on Natural Perils

**Arctic**
- Temperature rise much larger than global average
- Decrease in Arctic sea ice coverage
- Decrease in Greenland ice sheet
- Decrease in permafrost areas
- Increasing risk of biodiversity loss
- Intensified shipping and exploitation of oil and gas resources

**Coastal zones and regional seas**
- Sea-level rise
- Increase in sea surface temperatures
- Increase in ocean acidity
- Northward expansion of fish and plankton species
- Changes in phytoplankton communities
- Increasing risk for fish stocks

**North-western Europe**
- Increase in winter precipitation
- Increase in river flow
- Northward movement of species
- Decrease in energy demand for heating
- Increasing risk of river and coastal flooding

**Mediterranean region**
- Temperature rise larger than European average
- Decrease in annual precipitation
- Decrease in annual river flow
- Increasing risk of biodiversity loss
- Increasing risk of desertification
- Increasing water demand for agriculture
- Decrease in crop yields
- Increasing risk of forest fire
- Increase in mortality from heat waves
- Expansion of habitats for southern disease vectors
- Decrease in hydropower potential
- Decrease in summer tourism and potential increase in other seasons

**Northern Europe**
- Temperature rise much larger than global average
- Decrease in snow, lake and river ice cover
- Increase in river flows
- Northward movement of species
- Increase in crop yields
- Decrease in energy demand for heating
- Increase in hydropower potential
- Increasing damage risk from winter storms
- Increase in summer tourism

**Mountain areas**
- Temperature rise larger than European average
- Decrease in glacier extent and volume
- Decrease in mountain permafrost areas
- Upward shift of plant and animal species
- High risk of species extinction in Alpine regions
- Increasing risk of soil erosion
- Decrease in ski tourism

**Central and eastern Europe**
- Increase in warm temperature extremes
- Decrease in summer precipitation
- Increase in water temperature
- Increasing risk of forest fire
- Decrease in economic value of forests
Insurance Industry & Climate Change

https://www.insuranceeurope.eu/climate-change
Insourcing or Outsourcing of this work? The advent of Oasis

- Demands of the Solvency II regulatory agenda for capital allocation... calculate RDS!
- Data, data structuring, data management, creating standards a big problem area!
- Large global insurers and reinsurers tend to do their own modelling in-house..... verifying the result with comparative work from 3rd parties
- National or regional insurers tend not to have the resources & know-how for NatCat risk modelling
- Opening the “black box”... Making models & the modelling service more widely available... the Oasis business model... open source platform
- Interaction of scientific and academic experts with insurance industry experts via the Oasis platform has traction
- The demands of understanding climate change and its impact on NatCat loss activity is leading to more public-private cooperation
Project H2020_Insurance
Objectives & Structure

• Operationalization of the Oasis Loss Modelling Framework
• Combination of climate services with damage and loss information
• Standardised risk assessment (areas at most risk and quantify financial losses of modelled scenarios)
• Proof of concept via five demonstrators co-designed to end-user communities in the insurance, municipalities and business sector
## H2020_Insurance: Partner Consortium

<table>
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<tr>
<th>Project period</th>
<th>Grant amount</th>
<th>Project coordinator</th>
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<tbody>
<tr>
<td>May 2017- April 2020</td>
<td>EUR 4,802,522.01</td>
<td>Potsdam Institute for Climate Impact Research (PIK), Germany</td>
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Contact: H2020_Insurance@pik-potsdam.de  
Website: www.h2020insurance.oasishub.co
The good work of JRC & the need for PPP’s

- Areas of current dialogue & cooperation
- Disaster Risk Management Unit – flood and forest fire
- MARS – agriculture risk analytics in CEE region
- Excellent research work largely unknown in the insurance industry
- Scientific evidence to inform & support (insurance?) policy
- Shift from disaster management to disaster risk management
- Union Civil Protection Mechanism (UCPM)
- Adaptation to Climate Change
- **Start a competition for the best PPP ideas!**

- A **prize for the best PPP solution to close the Natcat Protection Gap – ClimateChangeInsurTech**
The good work of JRC & the need for PPP's

**We can't manage what we can't measure...**

Harmonised EU approach to systematically record and manage Disaster Loss Data

JRC leads an EU process with MS to develop solutions for measuring disaster losses

- Recording Disaster Losses (July 2013)
- Current status and best practices (Nov. 2014)
- Guidance for Disaster Loss Data Recording (Apr. 2015)
- Disaster Damage and Loss Data for Policy (Dec. 2017)
- Loss database architecture for DRM (Dec. 2017)

Development of guidelines...

...Support to Member states (DRMKC Support Service)
Challenges and Considerations
Data Management for Modelling Purposes

• What is happening in the world of “Big Data”?  

• Data availability and data quality…. data standards

• Data resolution and transparency vs. data protection, GDPR

• Data Sharing and a collaborative approach vs. data protection, GDPR

• Significance of Artificial Intelligence for data management
Activities of G&Co – what we do

- Consulting Company and Reinsurance Broker, established in 2003 in Munich with Focus on Risk Management & Risk Transfer Solutions for specialty lines of business
- Our Clients are Institutions & Insurance Industry
- Research & Expert Network Natural Perils & Climate Change
- Public Private Partnership Approach (PPP)
- Europe-wide Activities, but primary focus on DACH, CEE & CIS Markets
- Project in course H2020_Insurance Danube Flood Model
- Project in course „Agriculture Risk Metrics“ ARM
- Project in course „Agriculture Risk Academy“ ARA
- Project in course „INN Forest Watch“ in Norway
- Project planned for 2018 „Forest Watch Austria“
- Annual Experts Workshop „Best Practice Risk Management Natural Perils“
Thank you for your attention!

Genillard & Co. GmbH
Ismaninger Street 102
81675 Munich, Germany
Email: c.genillard@genillard-co.de
https://www.genillard-co.com/

H2020_Insurance - Project Coordination
Dr. Fred Hattermann
Potsdam Institute for
Climate Impact Research
Email: H2020_Insurance@pik-potsdam.de
https://h2020insurance.oasishub.co/