

# Presentation on Benfield

Czech Flood 2002 and Cat Modelling

Tuesday 10<sup>th</sup> June 2003

- Introduction to Benfield
- 2002 Flood and the Insurance Market
- Effect of Flood on reinsurance
- Role of Risk Quantification
  - Czech GAP Flood Model
- Natural Hazards Modelling in ex-YU
- Future Trends

# BENFIELD

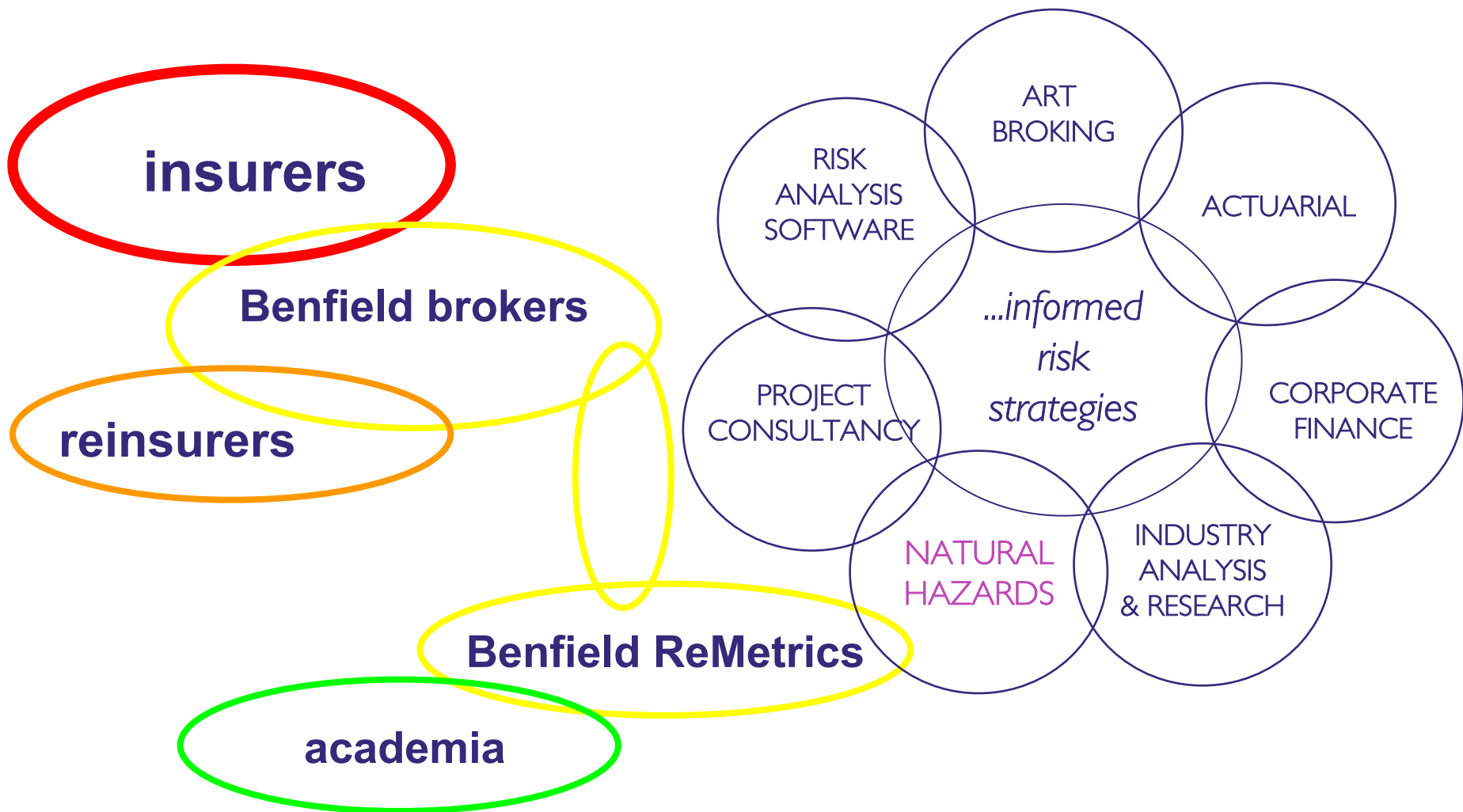




- **Largest independent reinsurance broker in the world**
- **34 offices with 1,700 employees worldwide**
- **History**
  - 1874 – Fester Fothergill & Hartung formed
  - 1921 – W.T. Greig formed
  - 1974 – Greig Fester
  - 1995 - Benfield acquire Ellinger Heath Western
  - 1997 – Benfield merges with Greig Fester
  - 2001 – Benfield Greig merges with E.W. Blanch
- **Premium throughput of more than \$ 6B**
- **Revenue of £291M in 2002**



- **e-business Initiative of the Year 2001**
  - Insurance Day
- **Broking Initiative of the Year 2000 and 2002**
  - The Review Awards
- **1998, 1999 & 2000 International Reinsurance Broker of the Year and then 2002 Large Broker of the Year**
  - The British Insurance Awards
- **Most Innovative Reinsurance Broker 2002**
  - Reactions magazine



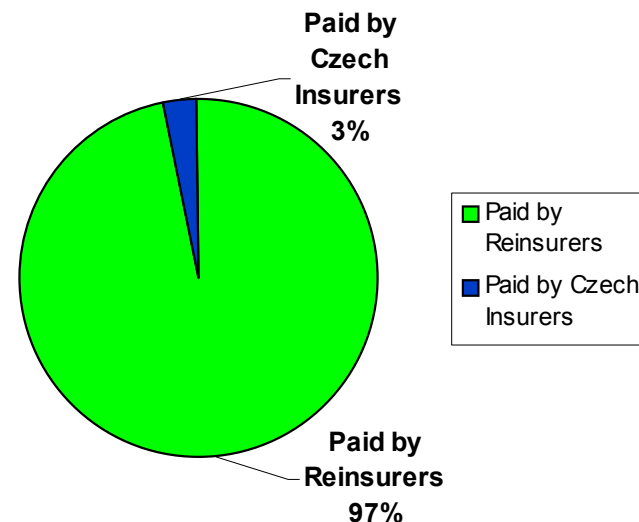
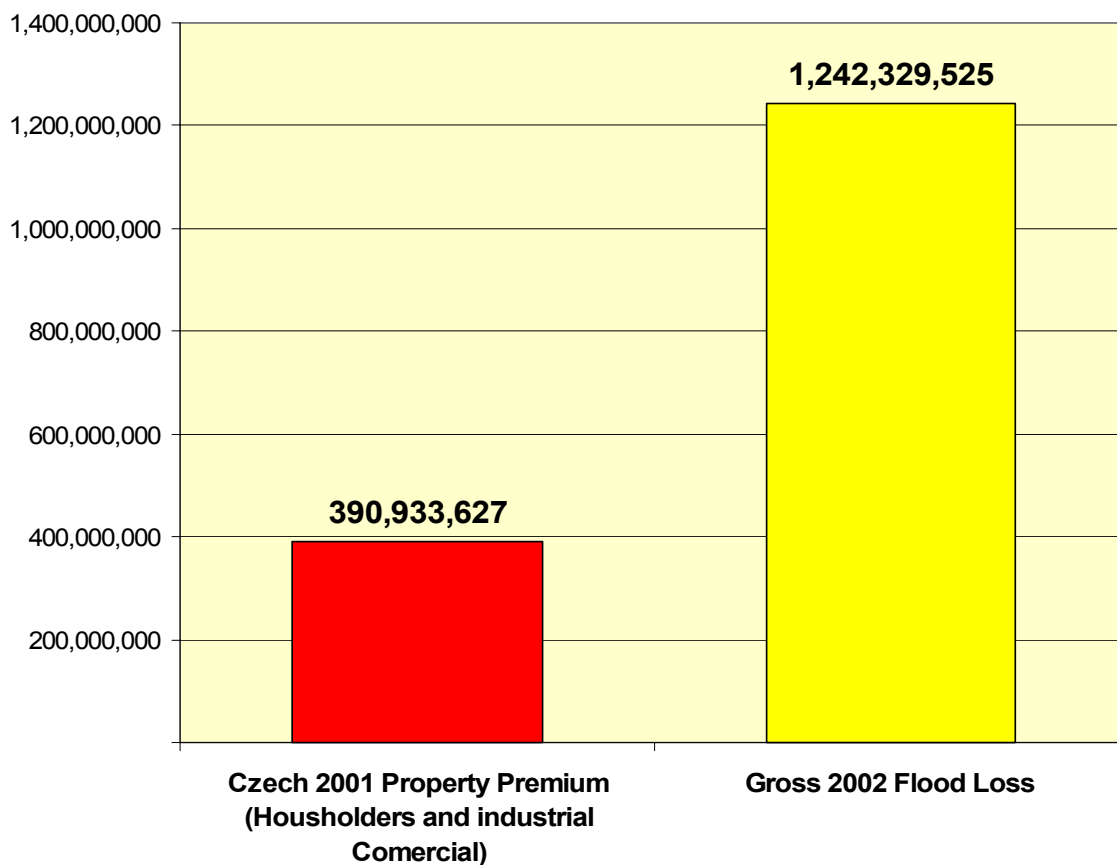


# 2002 Flood and the Czech Insurance Market @ 31<sup>st</sup> May 2003



## Flood Claim (in CZK 000') Retained / Reinsured

### 2002 Czech Market Flood Claims (in US\$)

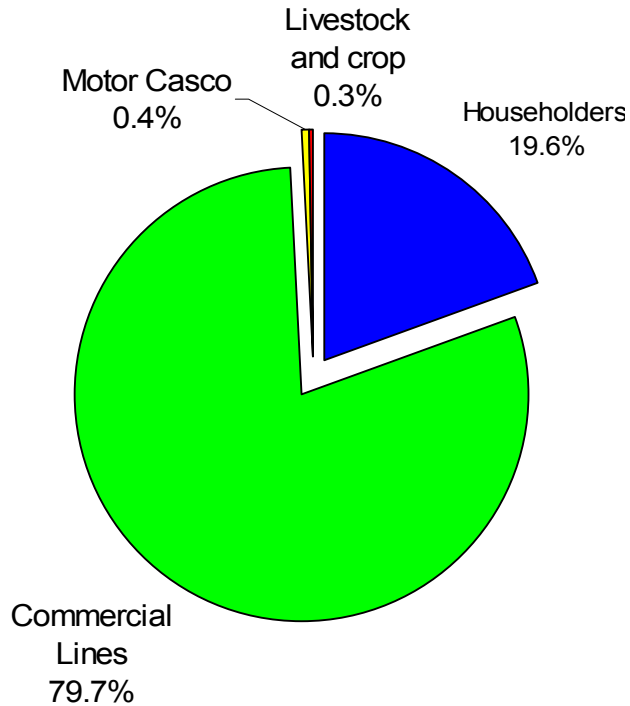




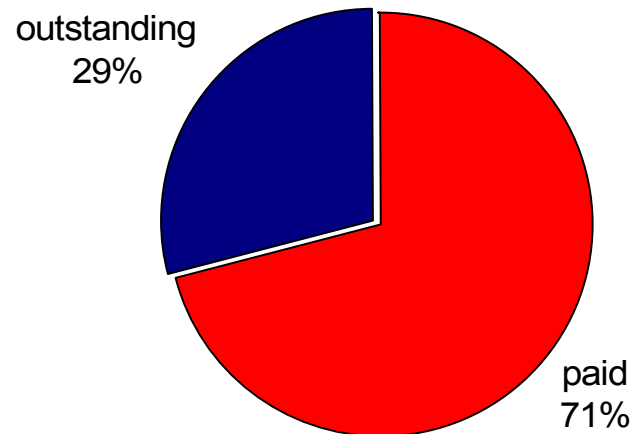
# 2002 Flood loss by Line and Payment status @ 31<sup>st</sup> May 2003



**Incurred Flood Loss by Line**



**Flood Losses payment status  
as at 31<sup>st</sup> May 2003**

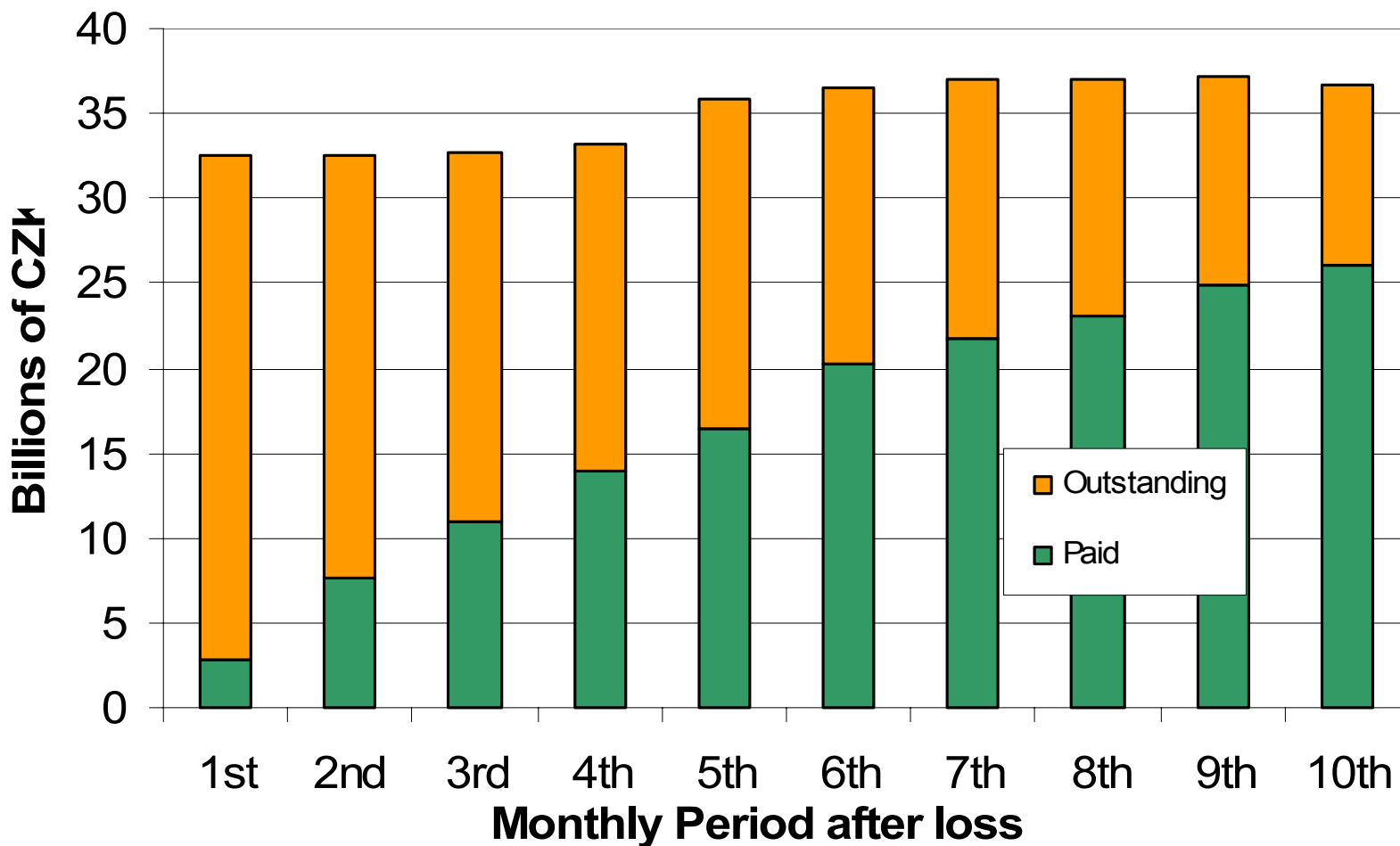






# Development Flood Payments by Month @ 31<sup>st</sup> May 2003

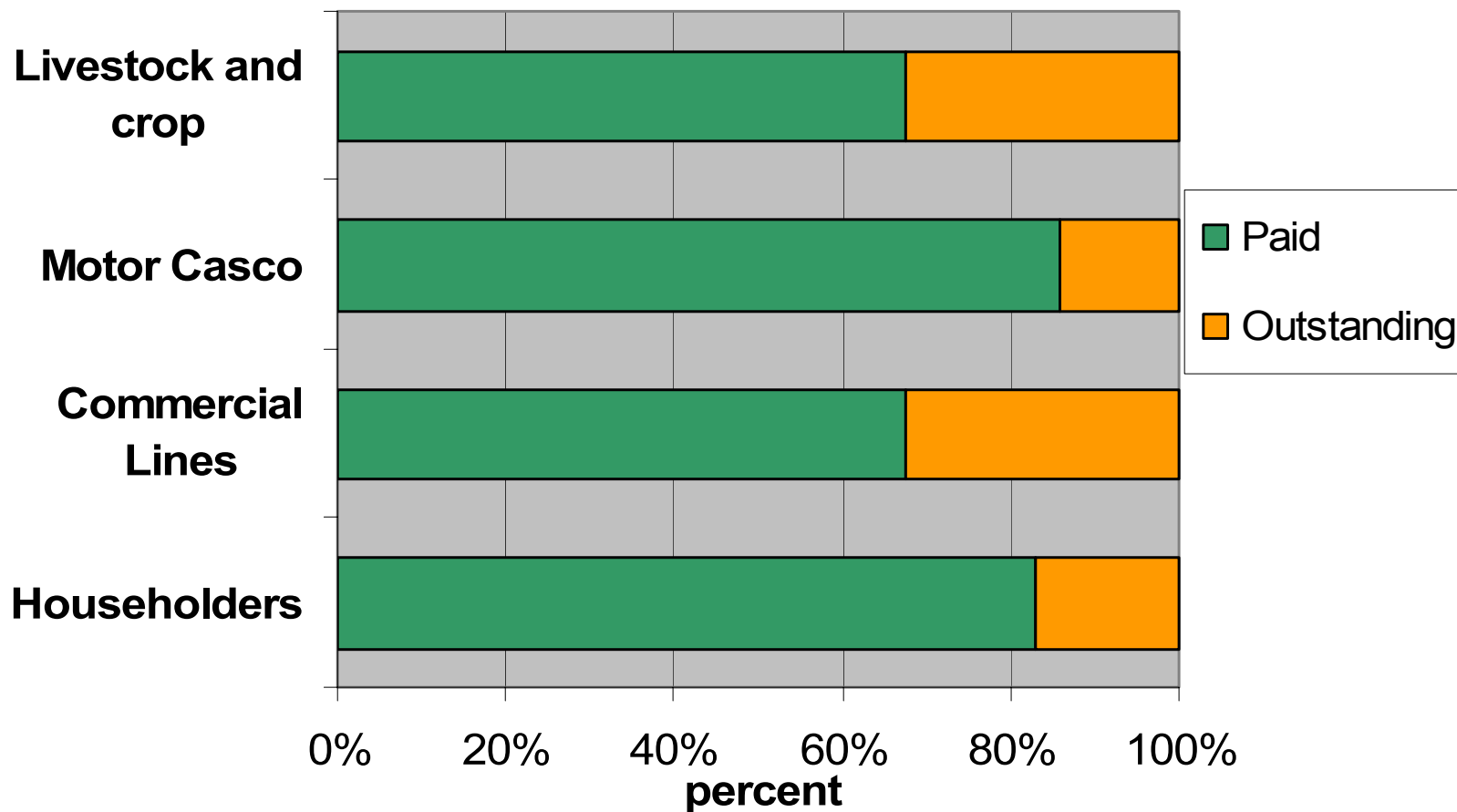
## Development of flood losses (including IBNR)





# Paid & Outstanding losses by Line @ 31<sup>st</sup> May 2003

## Paid/outstanding losses by line @ 31/5

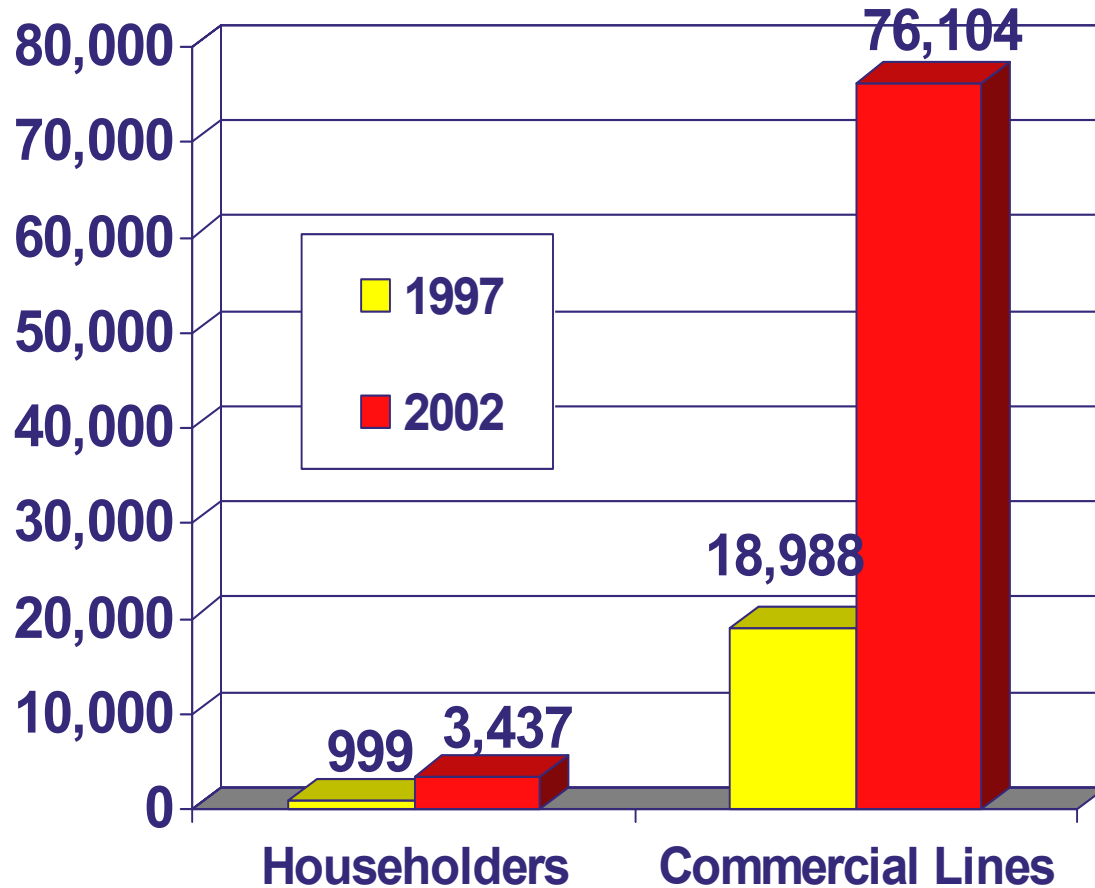




# Average Claim by Line – Czech Flood Loss in 1997 and 2002



## Average claim ( EUR)



**3.5 times higher**

**4 times higher**

## Number of claims

	1997	2002
Householders	101,802	67,345
Commercial Lines	10,524	12,381
Total Number of Claims	112,326	79,726

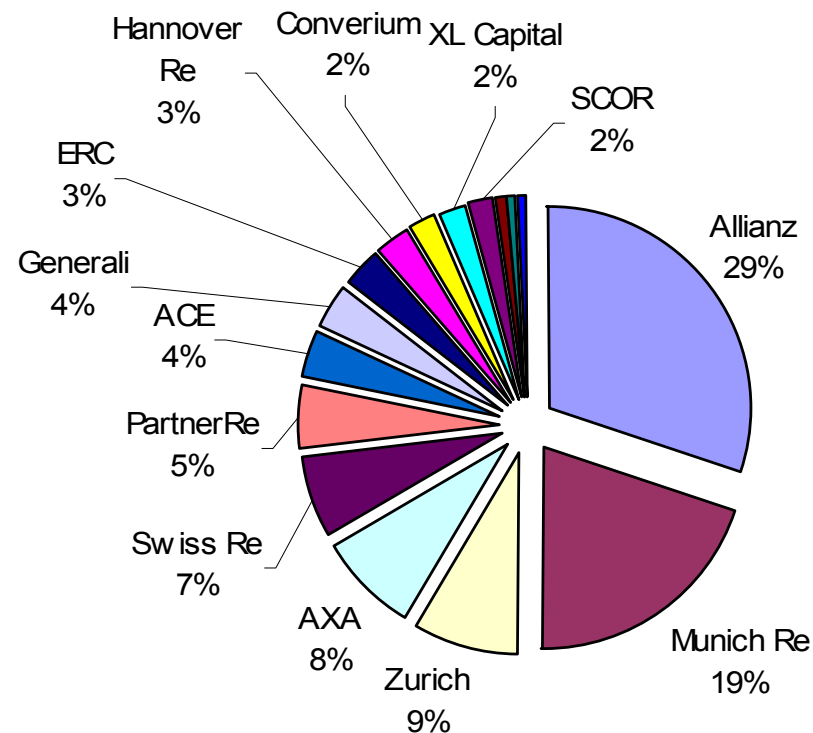


# 2002 European Flood Total Loss @ 5/3/2003



Group	Country	EUR mn
Allianz	Germany	770
Munich Re	Germany	500
Zurich	Switzerland	218
AXA	France	200
Swiss Re	Switzerland	171
PartnerRe	Bermuda	131
ACE	Bermuda	98
Generali	Italy	90
ERC	USA	82
Hannover Re	Germany	70
Converium	Switzerland	56
XL Capital	Bermuda	54
SCOR	France	50
Montpelier Re	Bermuda	22
IPC	Bermuda	20
PXRE	Bermuda	17
Total		2547

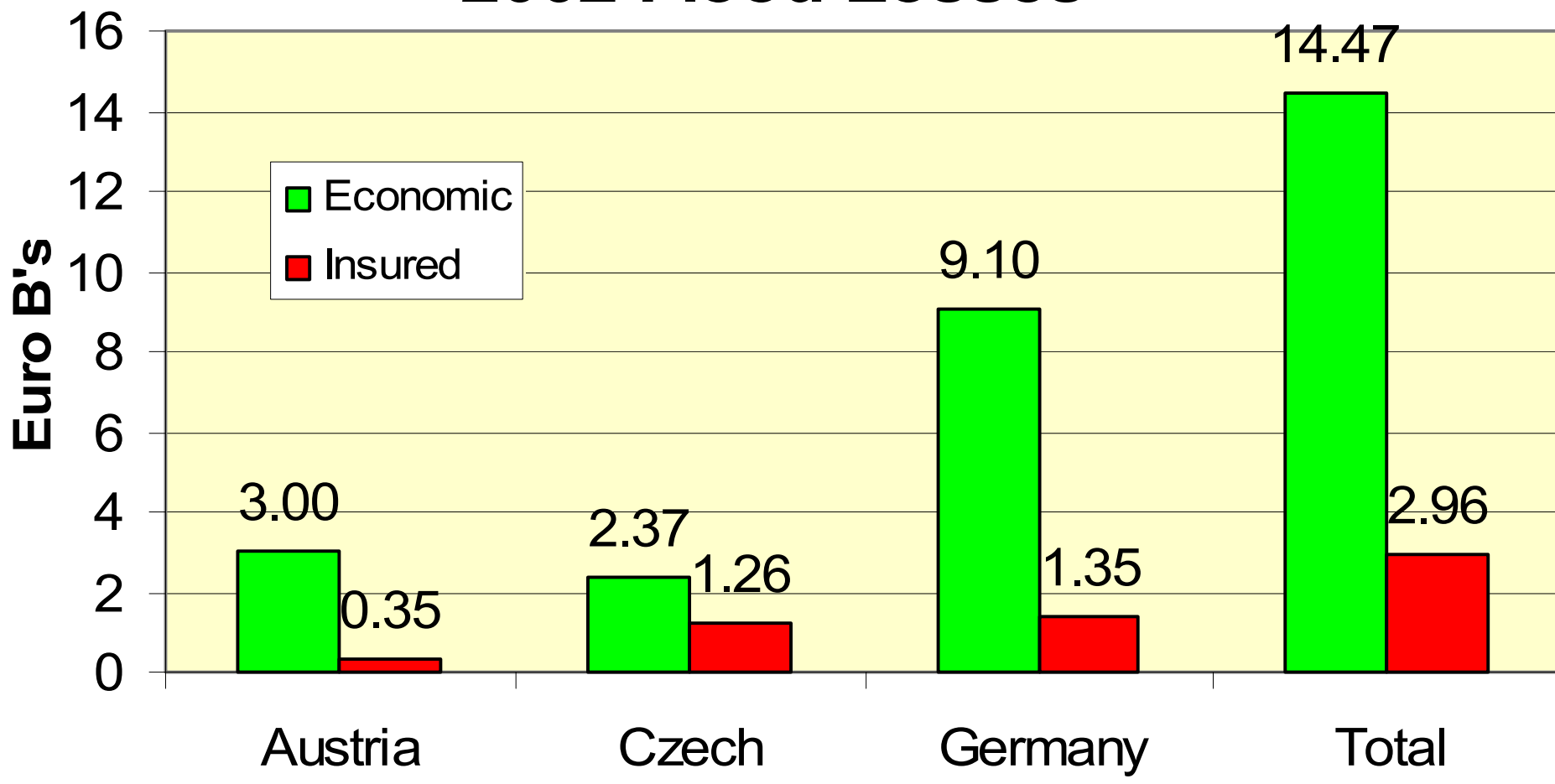
Source: Company Press Statements



Event	Year	Country	Insured Damage (USD mil.)
Windstorm Daria (90A)	1990	GB, F, B et al.	6.053
Windstorm Lothar	1999	F, CH et al.	5.998
87 J Storm	1987	Europe	4.550
Windstorm Vivian	1990	GB, F, B et al.	4.206
<b>Central European Floods</b>	<b>2002</b>	<b>Cz, D, A</b>	<b>2.950</b>
Windstorm Martin	1999	F, Sp., CH	2.482
Windstorm Anatol	1999	Denmark	2,450

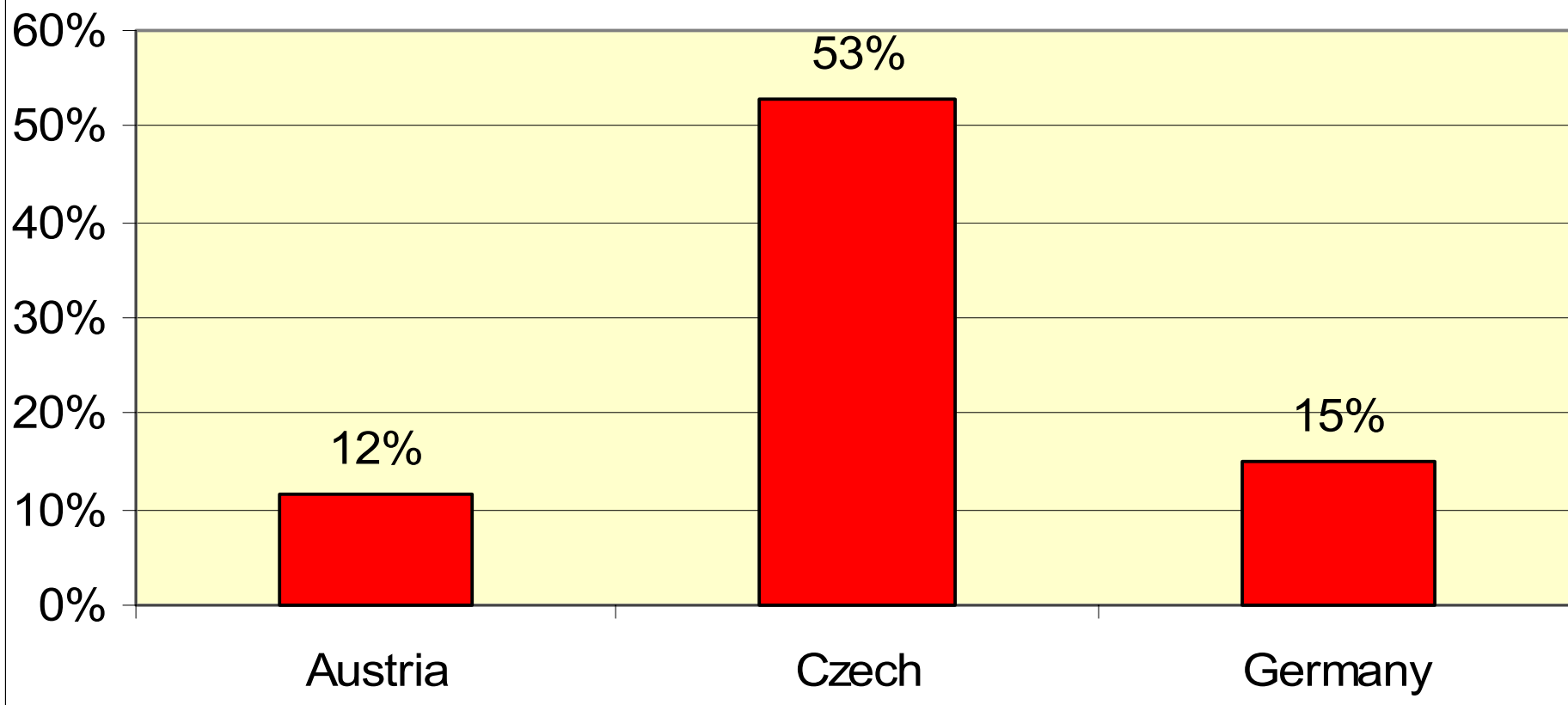


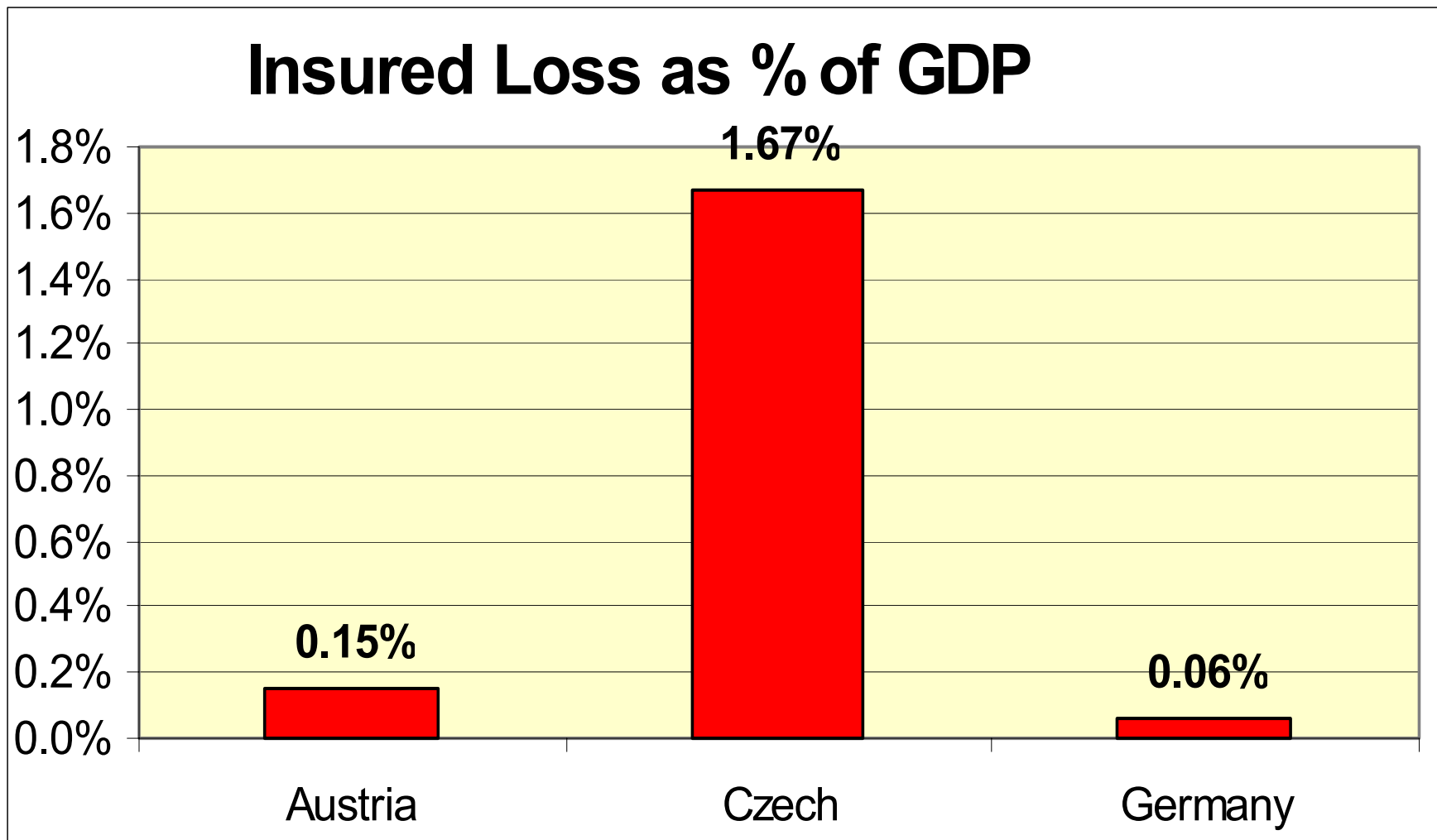
## 2002 Flood Losses



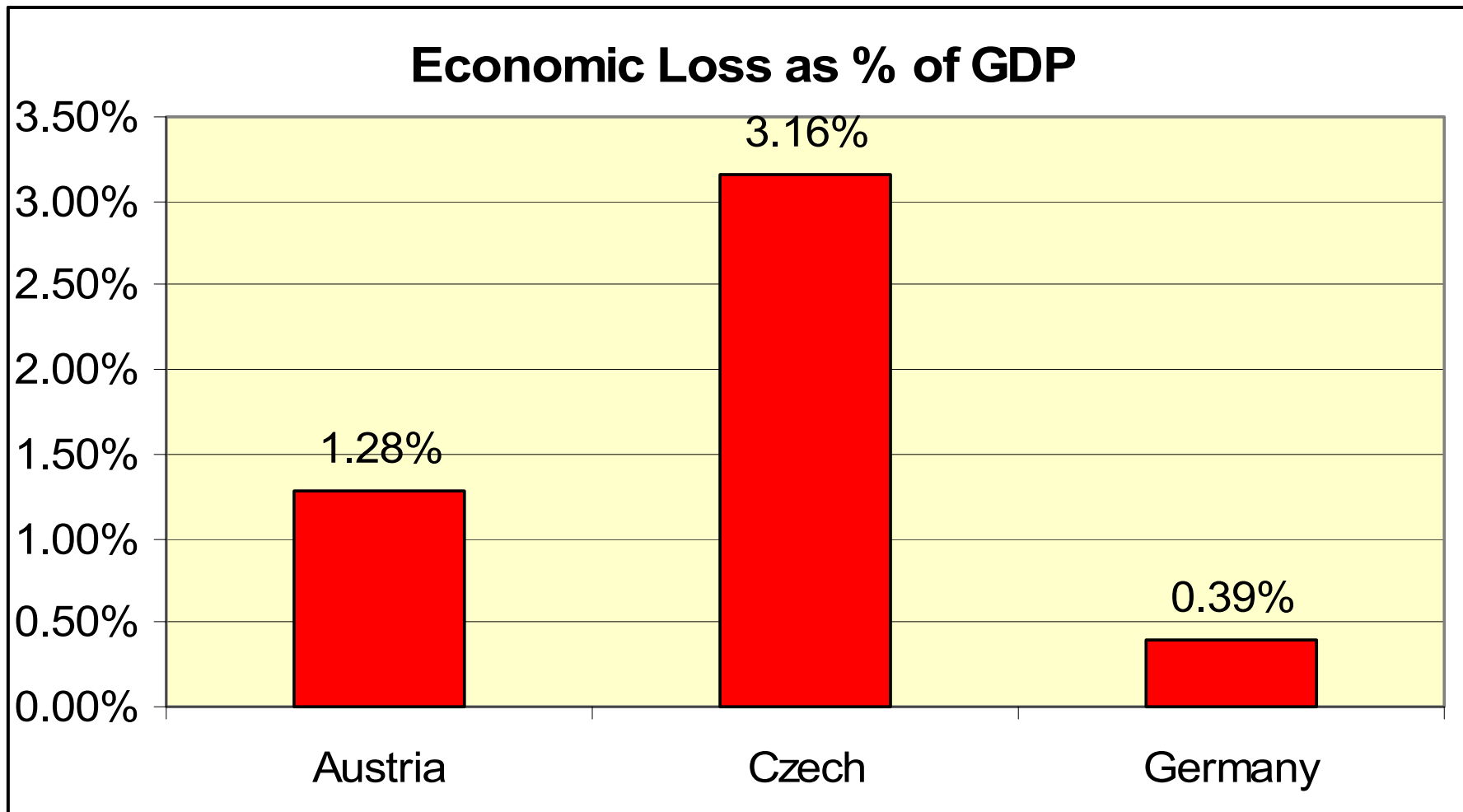


## 2002 Flood Insured relative to Economic Loss







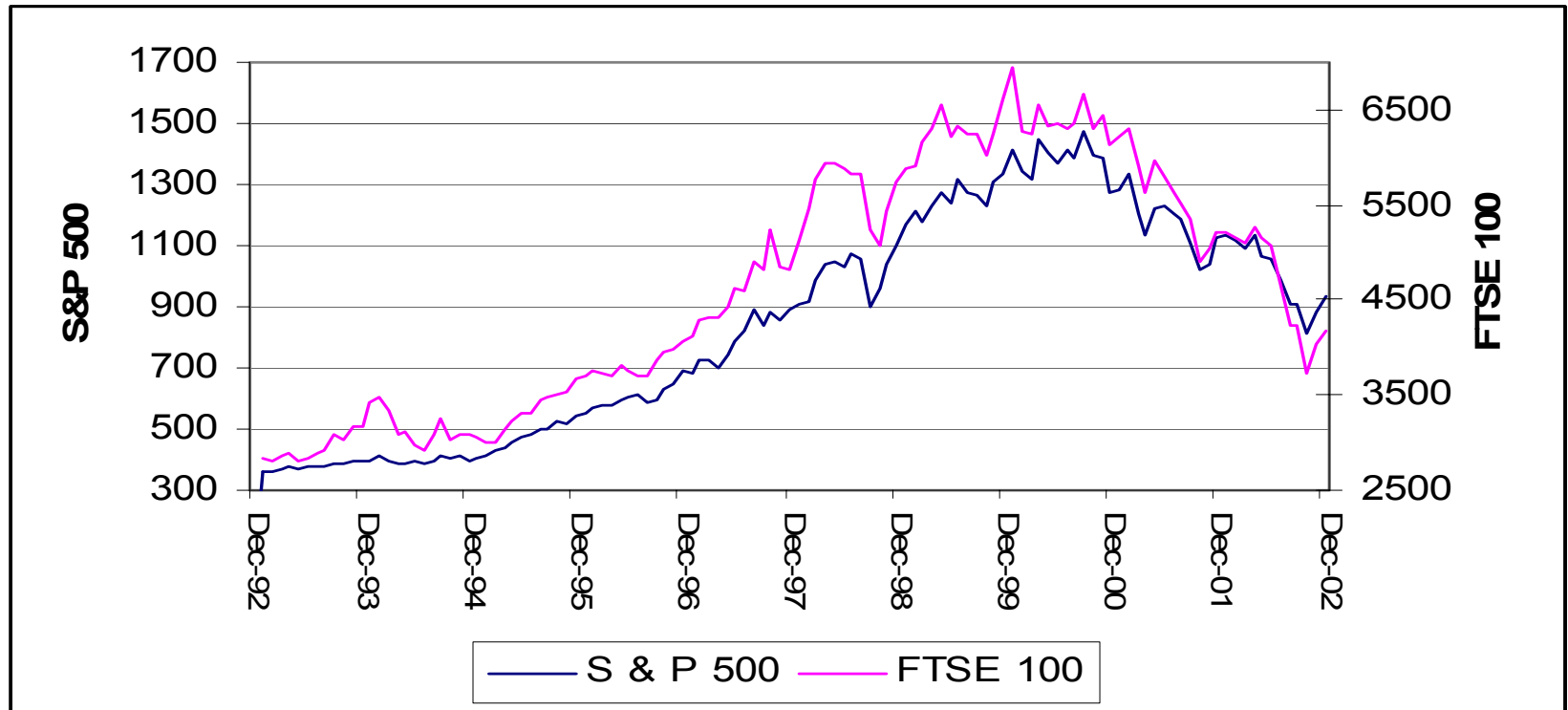




- Why was the Flood so important to the Czech reinsurers
- Second 1 in >100 event in 5 years
  - Czech Market now very unprofitable for reinsurers
  - Reinsurer appetite now much reduced



- **Equity market weakness: European reinsurers lost USD 56 bios in first 9 months 2002 and USD 54 bios in 2001**

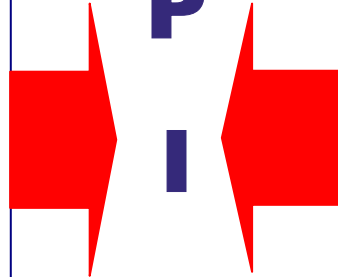




- Liabilities

- 9/11
- Losses – Euro floods, US D&O Enron etc
- Reserves – Asbestos, Worker's Comp, Toxic mould

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- Assets

- Bear stock markets
- Record bond defaults
- Increased credit risk – reinsurance recoverables

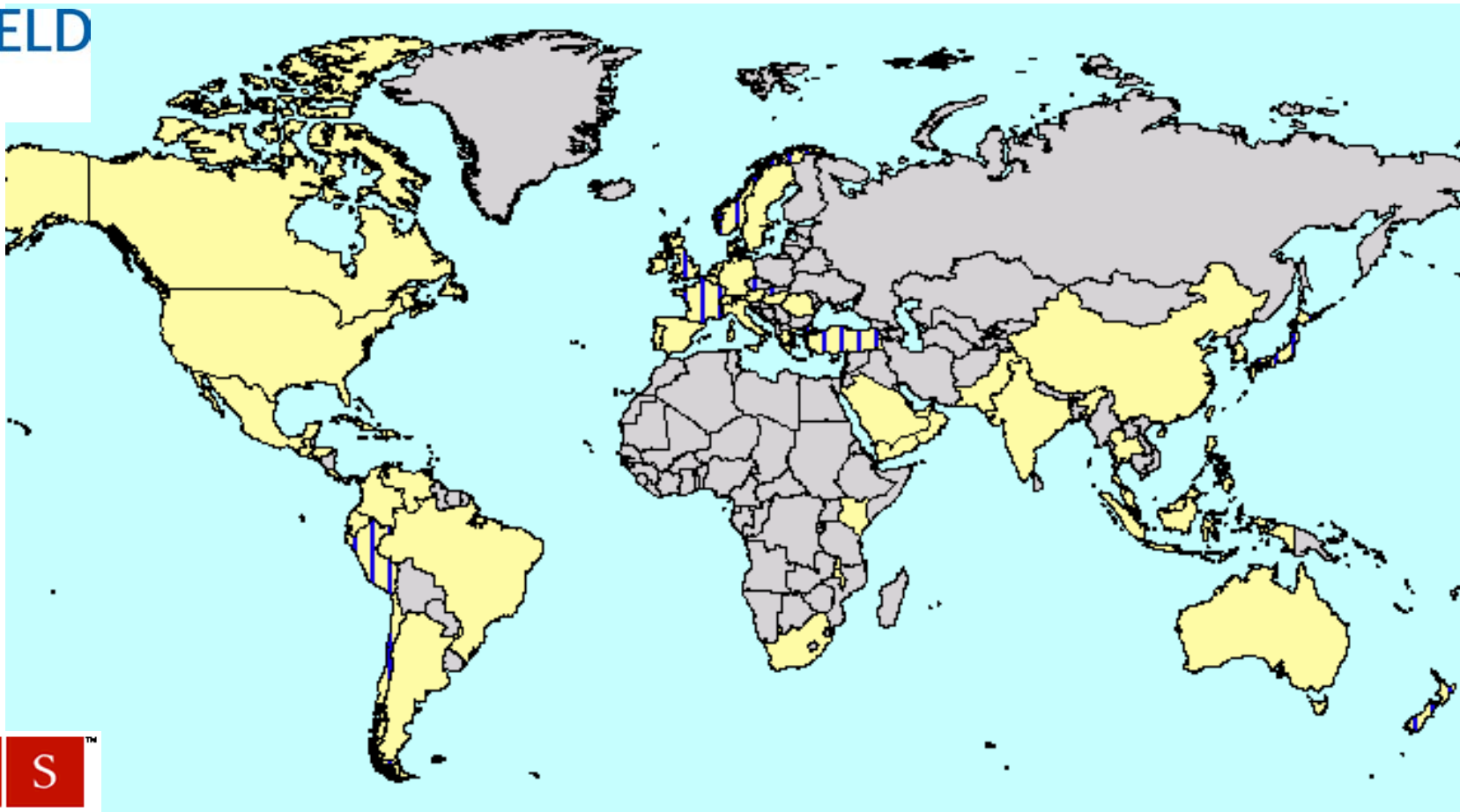


- Natural Hazard Perils excluded from Proportional Treaties
- Reinsurers demanding original Rate increases
- Reinsurers demanding Models for Cat. Perils
  - To quantify Flood PML's and Return Periods
  - To enable technical rating
- Natural Hazard to be separately rated and reinsured Non Proportionally



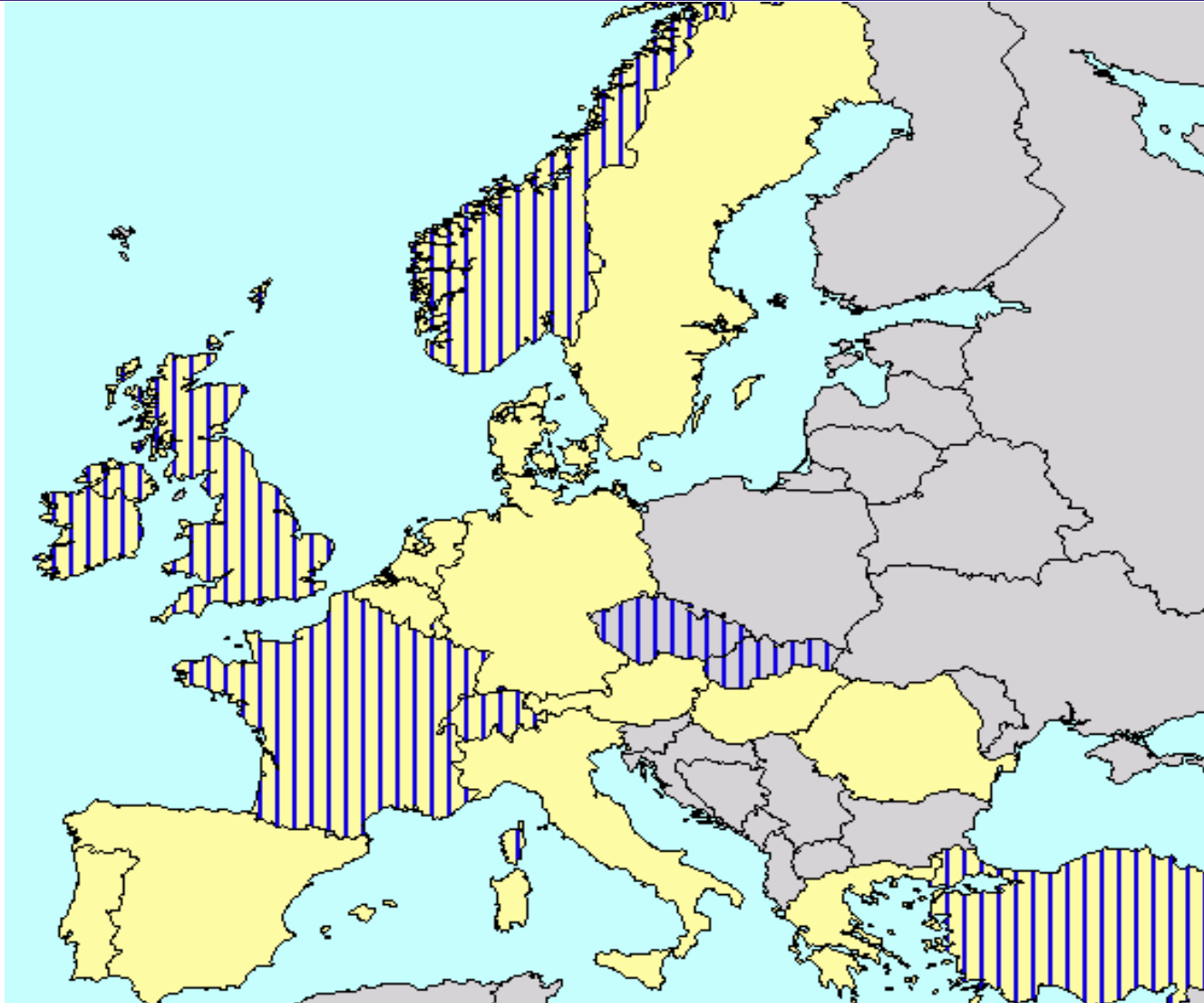
- Why now
  - BG now Leading Reinsurance Broker
  - GAP Flood Project started in March 2002
  - Post loss became requirement
- ReMetrics Launched Czech GAP Flood model
- Enabled quantification
- No external Flood Model covering CEE countries

# Countries and Perils Modelled by both Benfield ReMetrics and in External models





# Countries and Perils Modelled by both Benfield ReMetrics and in External models







# Role of Risk Quantification

## Czech GAP Flood Launched

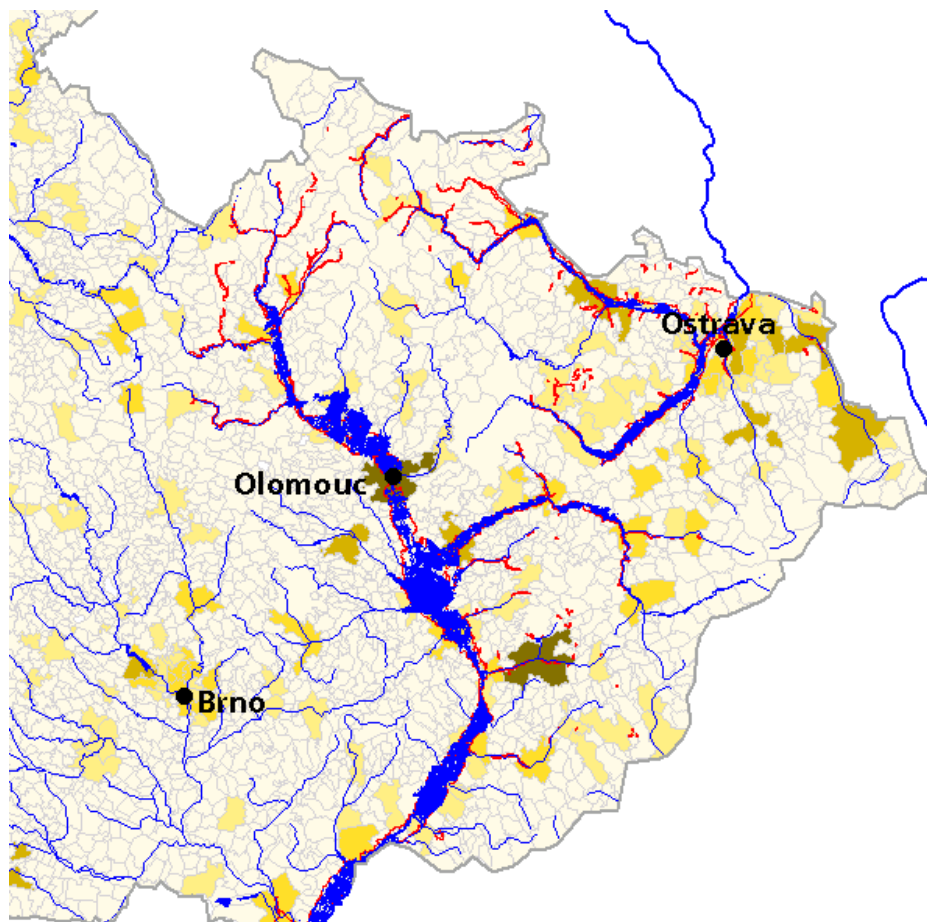


- Czech GAP Flood Model launched in November 2002
- All BG Clients portfolios analysed
- Average 95% of their risk were Geocoded
- 396 stochastic flood scenarios modelled
- Cedant's individual PML's and return periods assessed
- Model being re-calibrated on 2002 Flood data
- Model being extended to Slovakia



# Role of Risk Quantification Czech GAP Flood

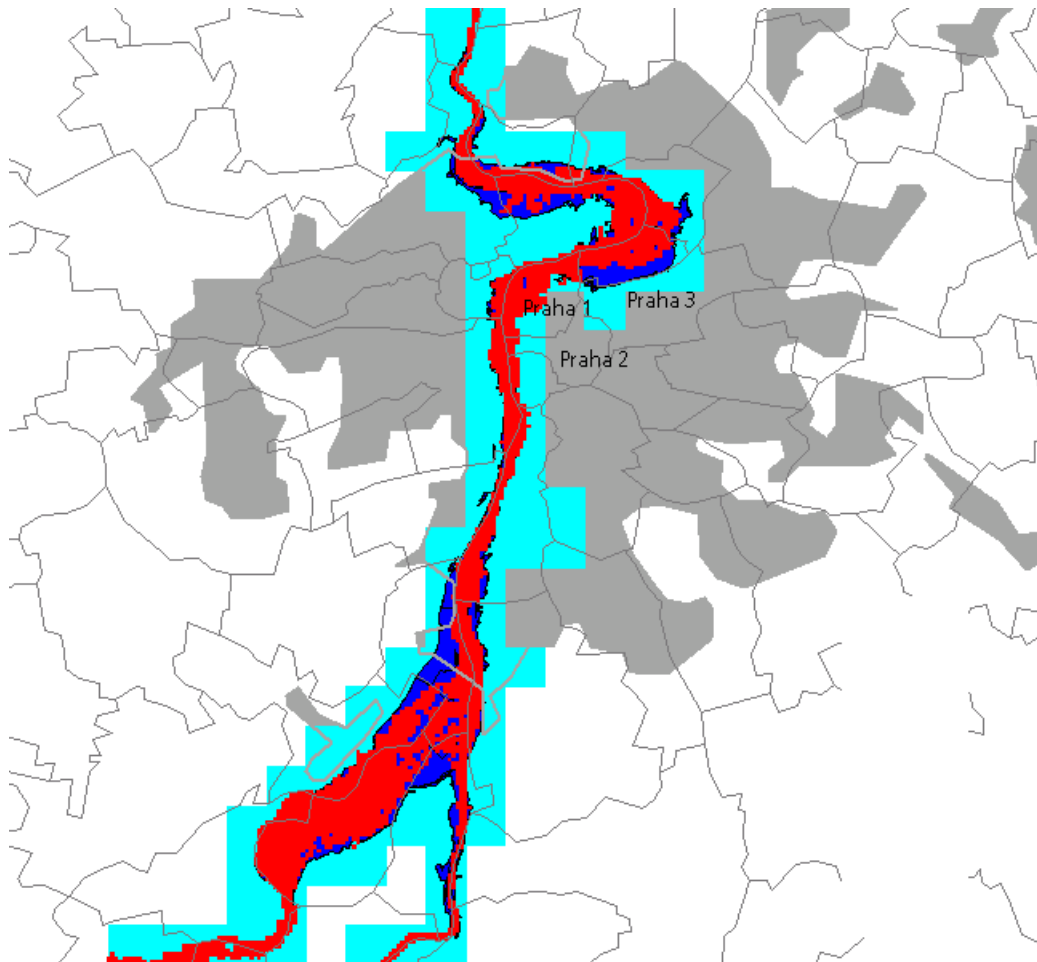
BG 1997 Flood modeled against observed





# Role of Risk Quantification Czech GAP Flood

## BG 2002 Flood modeled against observed



blue = observed  
red = modelled

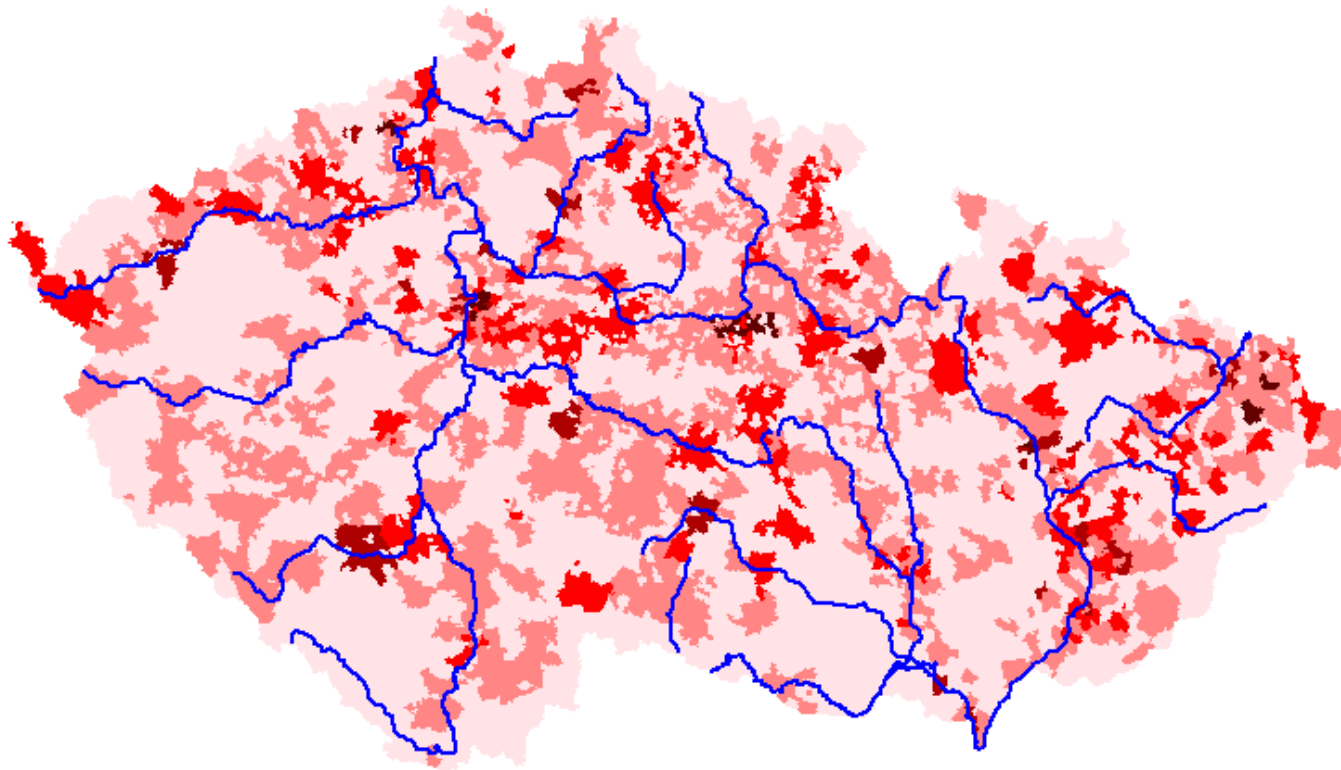




# Role of Risk Quantification Czech GAP Flood

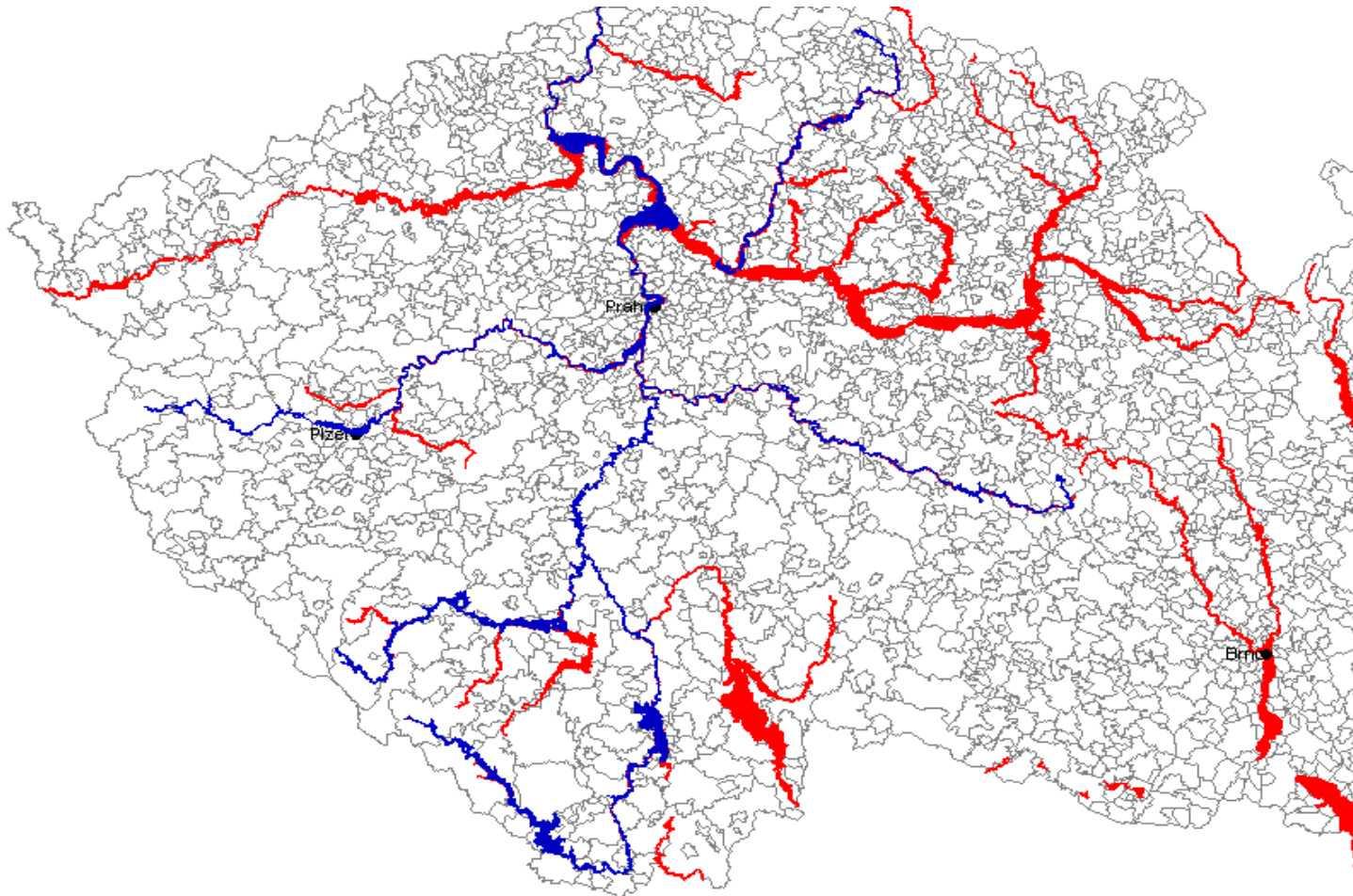


## Example of a Modeled Portfolio



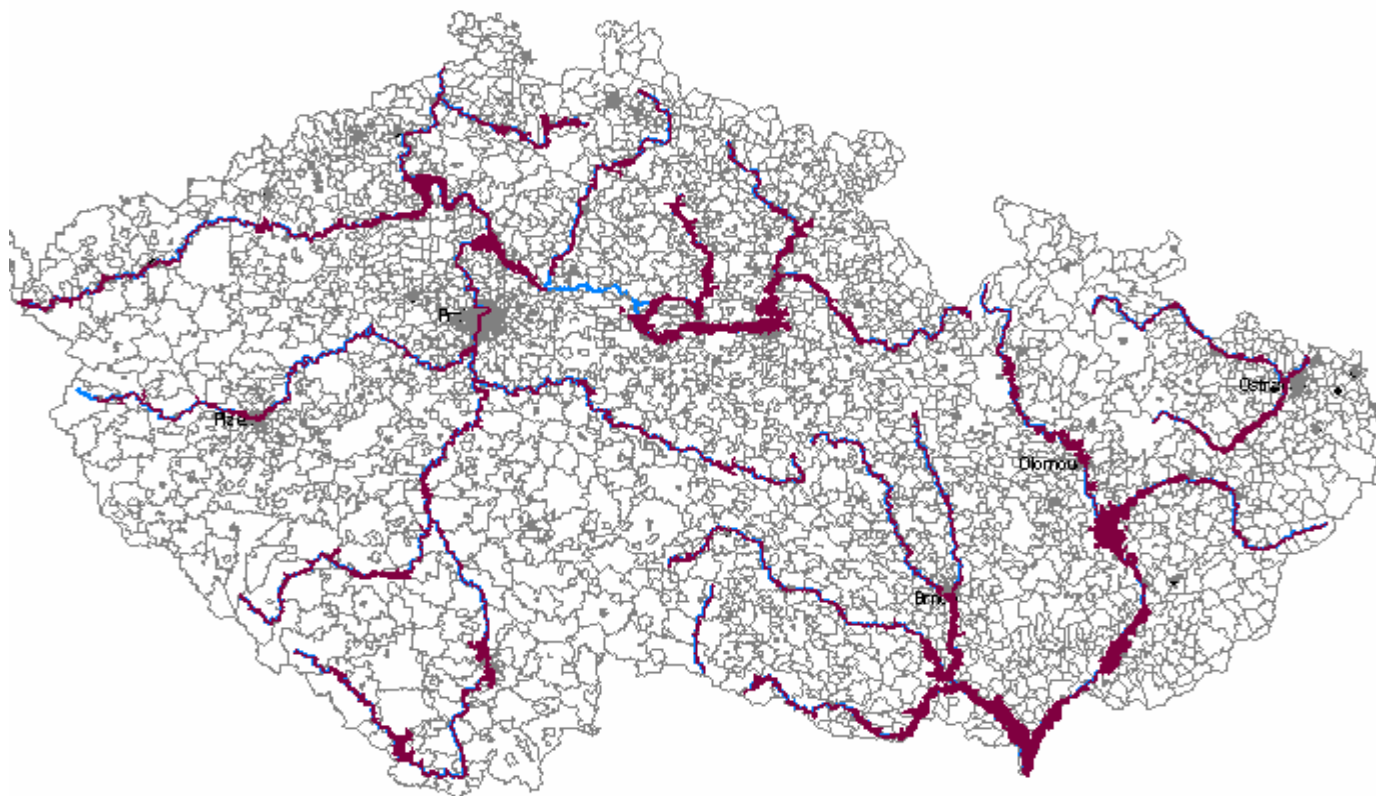


## 2002 Flood over Urban Areas and Flood Line





## Czech Rapid Snow Melt





## Return Period of the Event

<u>River</u> <u>(Years)</u>	<u>Station</u>	<u>Return Period</u>
Vltava	Praha	500
Labe	Melnik	500
Berounka	Beroun	250
Luznice	Klenovice	>1.000

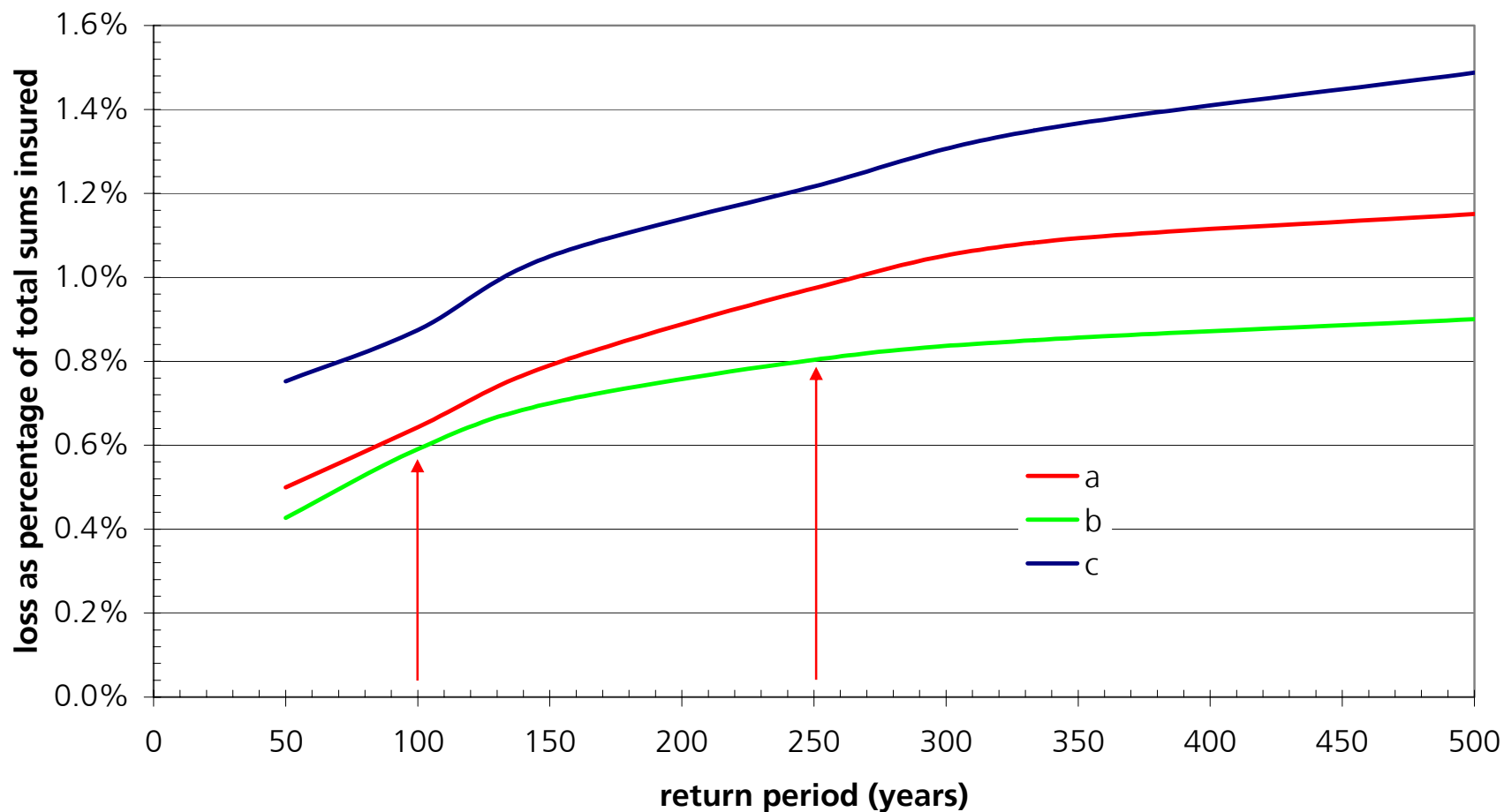


- **Return period of loss**
- Depends on the actual portfolio
- 1997 Flood: 67 – 95 years
- 2002 Flood: 83 – 175 years
- **Insurers now have a flood PML**
- Again depends on portfolio and return period





### Czech flood loss exceedance curves





# Natural Hazards Modelling in ex YU

## Peril order for Ex-YU

- earthquake
- flood
- hail
- landslides
- windstorm
- avalanches

Former Yugoslavia





# Natural Hazards Modelling in ex YU

## Peril coverage for Ex-YU

- earthquake coverage largely optional
- flood coverage largely optional
- sums insured exposed to natural hazards therefore much lower than full sums insured

Former Yugoslavia

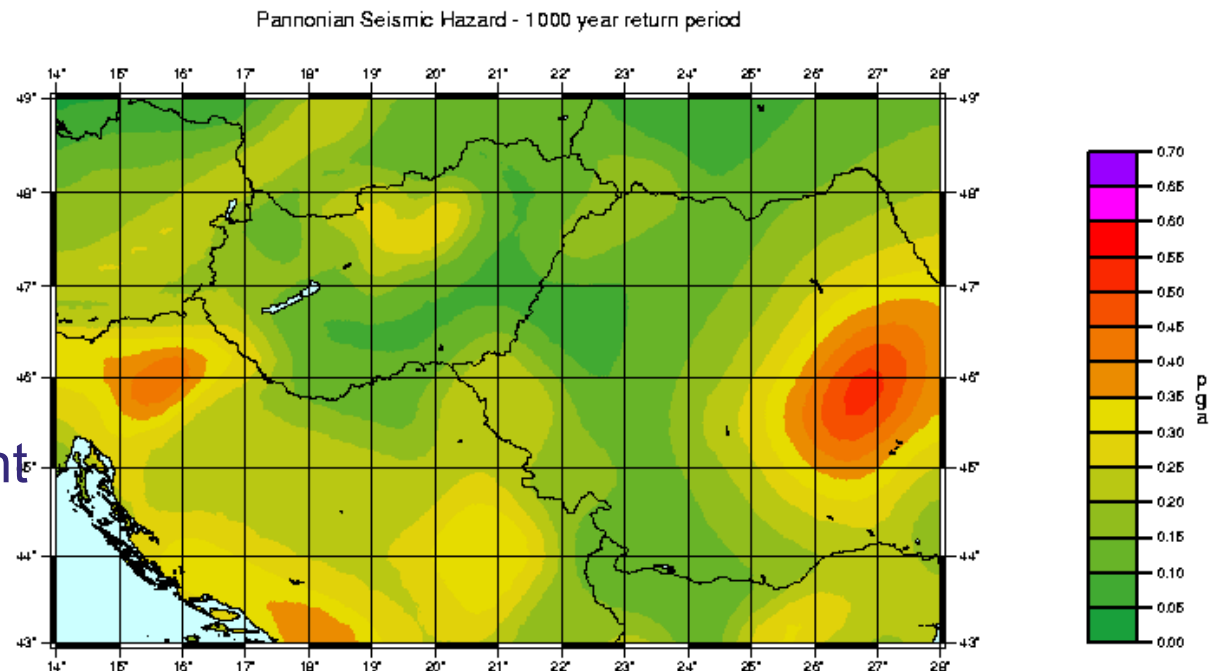




# Natural Hazards Modelling in ex YU

## Ex-YU earthquake risk

- many hazard maps available for the region
- mainly from engineering applications
- example on the right 1000-year PGAs
- their use for insurance purposes is limited



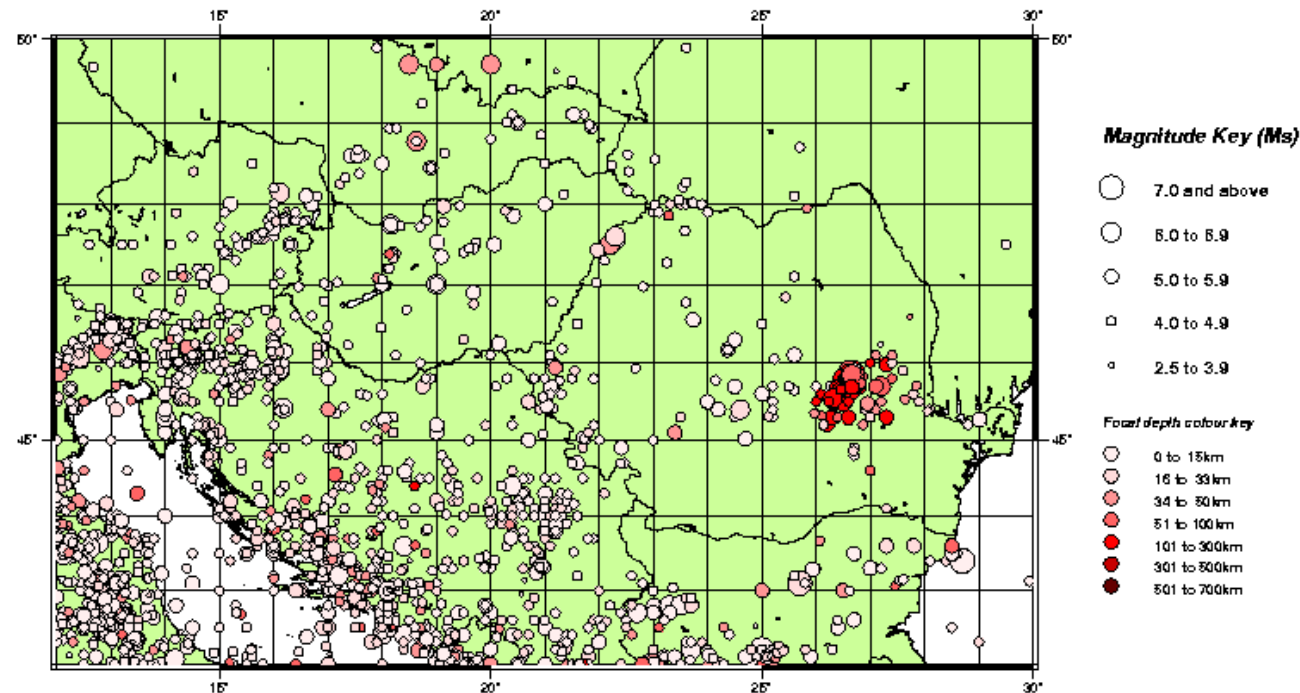




# Natural Hazards Modelling in ex YU

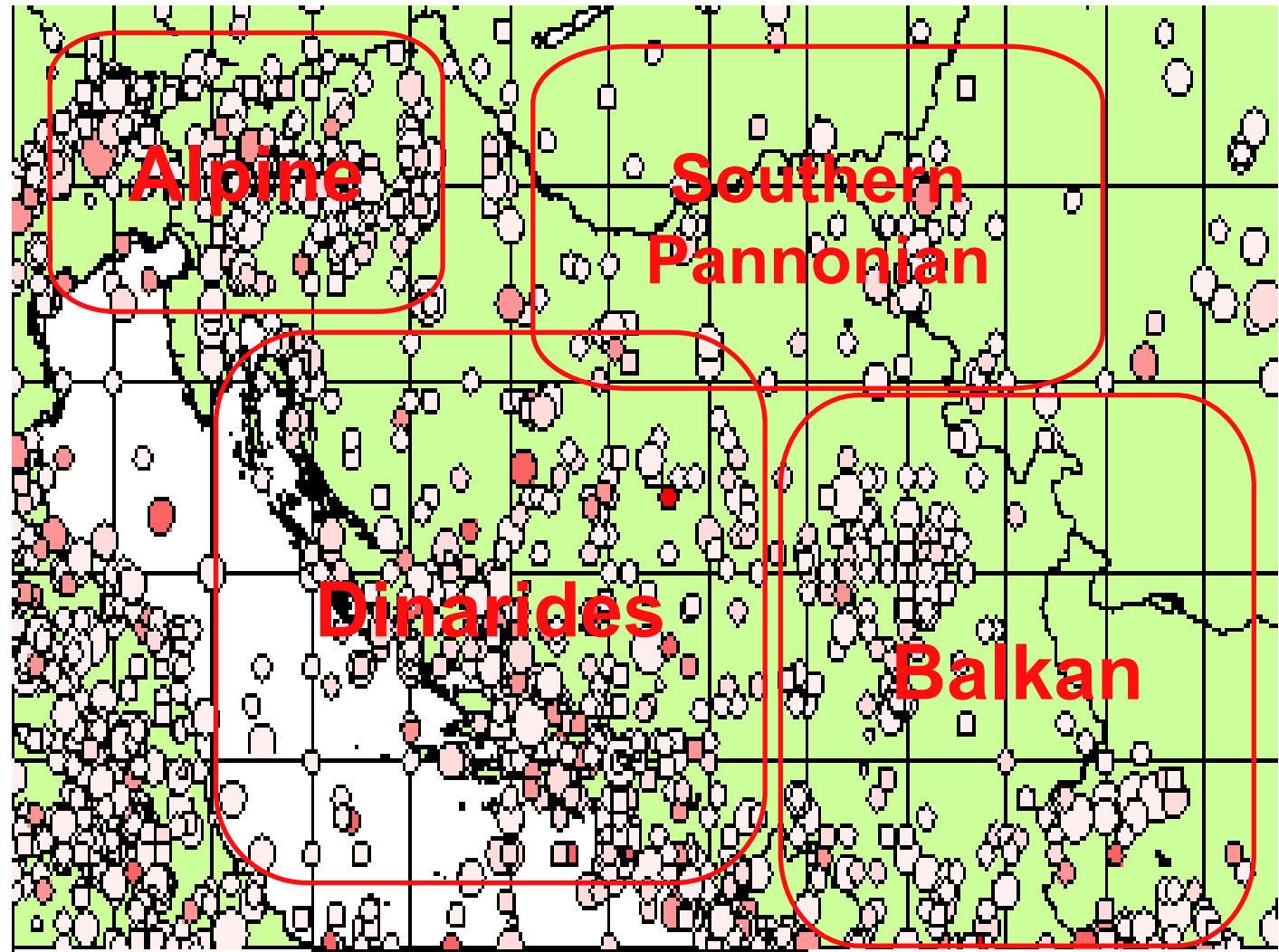
## Ex-YU earthquake risk

- for insurance modelling need to start from historic data
- picture shows events  $M > 4$  since 1022AD
- stochastic modelling needed
- vulnerability research needed





- 4 main areas of seismicity:
  - Alpine
  - Southern Pannonian
  - Dinarides
  - Balkan

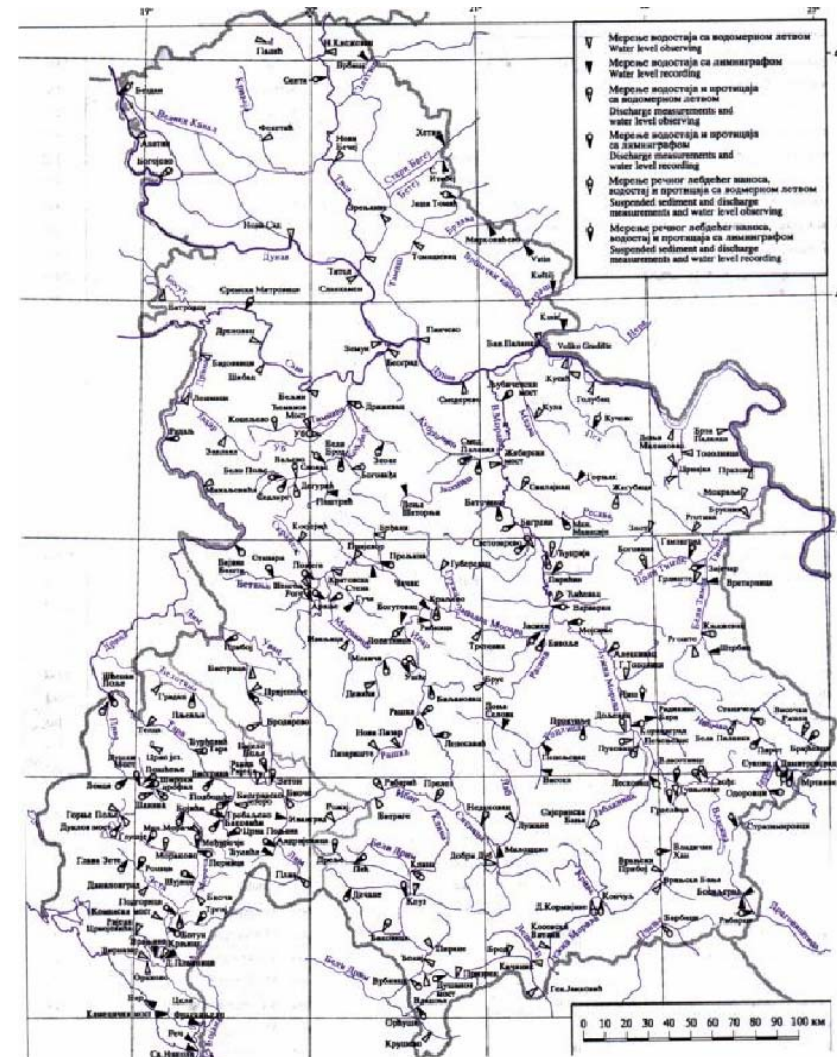




# Natural Hazards Modelling in ex YU

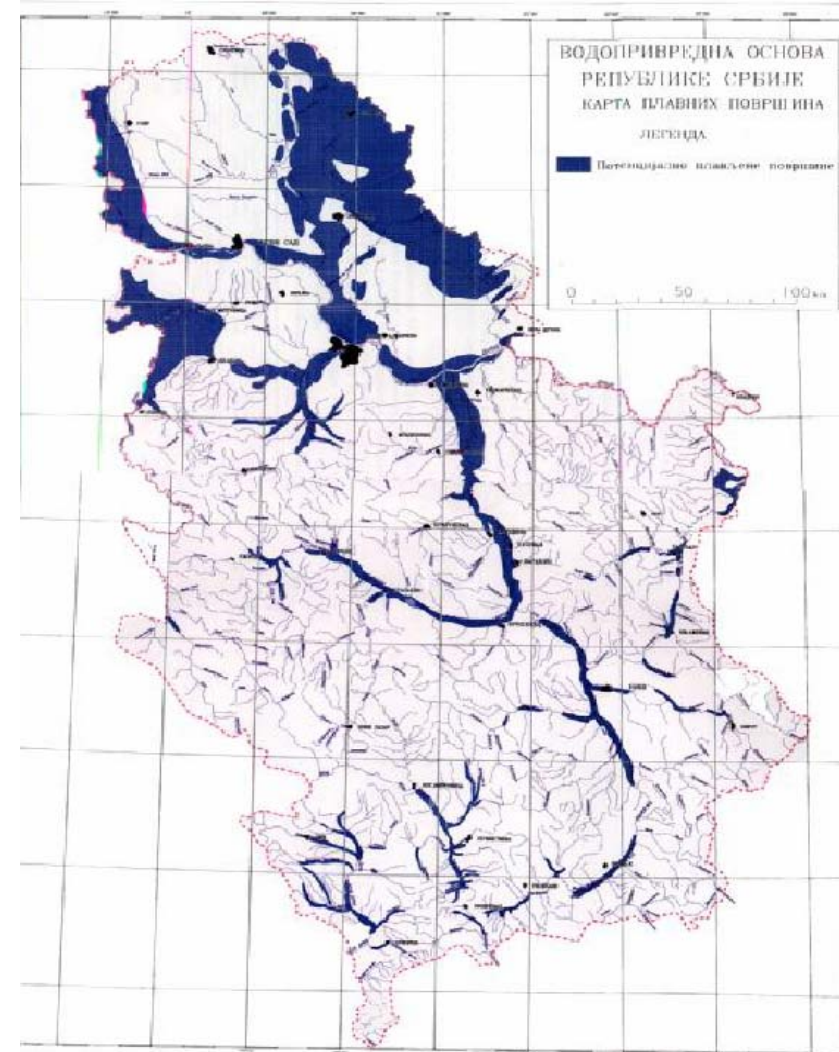
## Ex-YU flood risk

- picture shows gauging stations in Serbia & Montenegro
- data collection is a major task: flow, topography, rainfall, soil/geology, land use, climate variation, human influence (i.e. extent of urban areas and control structures)





- several modelling methods available
  - historical
  - geographical
  - hydrological (rainfall)
  - hydrological (flow)
  - geographical-hydrological
- picture shows potential floodable areas for Serbia
- long path from these maps to probabilistic portfolio losses







# Natural Hazards Modelling in ex YU

## Ex-YU flood risk

- indicative flood plain map for the former Yugoslavia

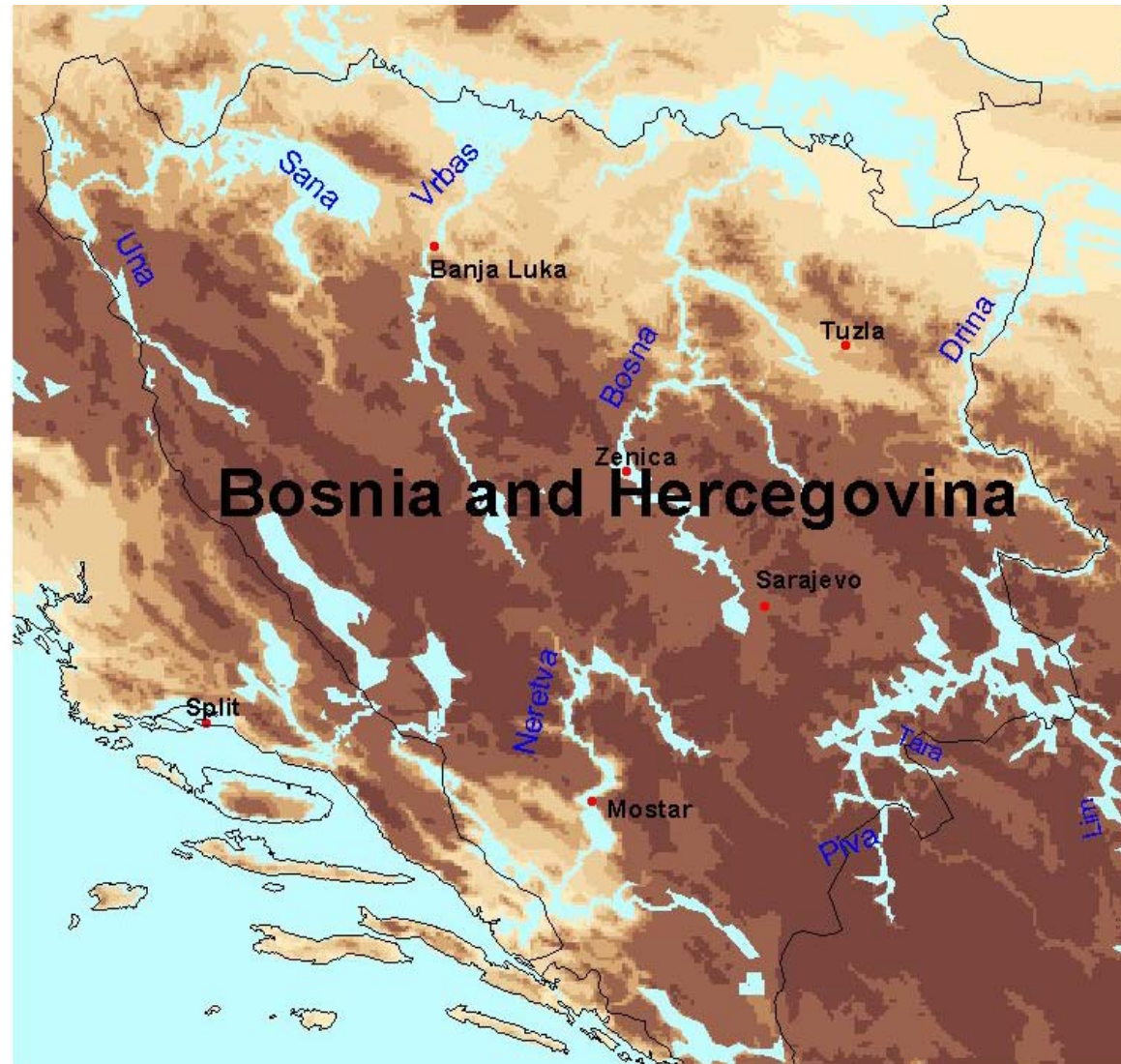




# Natural Hazards Modelling in ex YU

## Ex-YU flood risk

- indicative flood plain map for Bosnia and Herzegovina







# Natural Hazards Modelling in ex YU

## Ex-YU flood risk



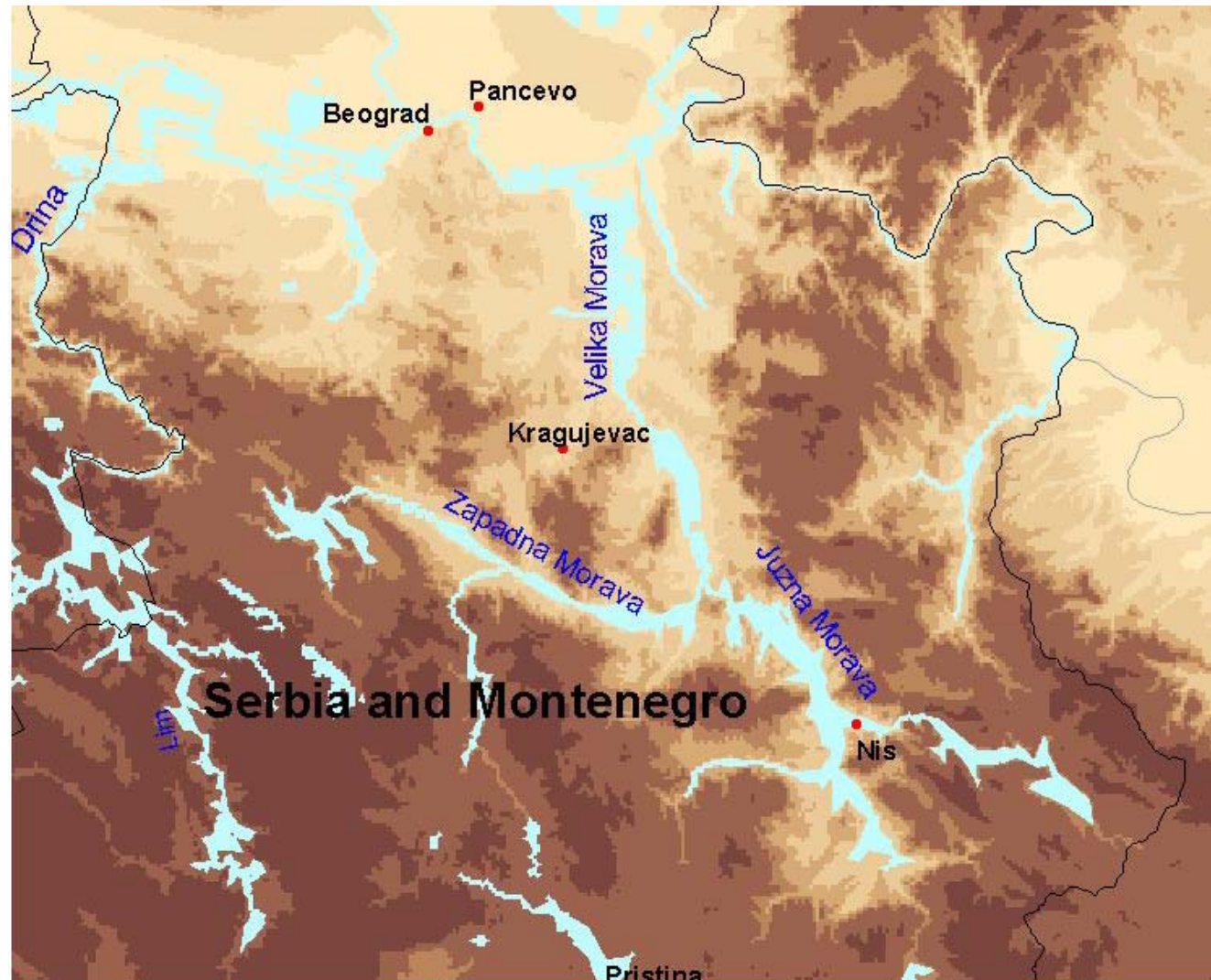
- indicative flood plain map for river Sava



# Natural Hazards Modelling in ex YU

## Ex-YU flood risk

- indicative flood plain map for river Morava







# Natural Hazards Modelling in ex YU

## Ex-YU flood risk

- indicative flood plain map for river Vardar





# Natural Hazards Modelling in ex YU

## Ex-YU other risks

- other natural hazards (hail, landslides etc.)
- mixture of actuarial and natural hazard modelling

Former Yugoslavia





- CEE insurers need Reinsurance Support
  - 2002 Flood Loss was 140% of Czech Market Shareholders Funds
  - Flood losses were 316% of Czech Property Premium income
- Reinsurers now looking for reasonable potential of profit
- Reinsurers required minimum rates to be applied
  - for both FLEXA and Flood Risks



- Stress of Reinsurance costs will lead to
  - Mergers
  - Closures
- Need for Modelling and Risk Quantification to
  - Reduce price of Cat X/L
  - Quantify Limits needed
- Market will look at Pooling Nat Cat Risks
  - However there are political and commercial restraints
- Cat increasingly commoditised
  - therefore need a Broker who is the market maker





- Thanks for your time
  - Questions?



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