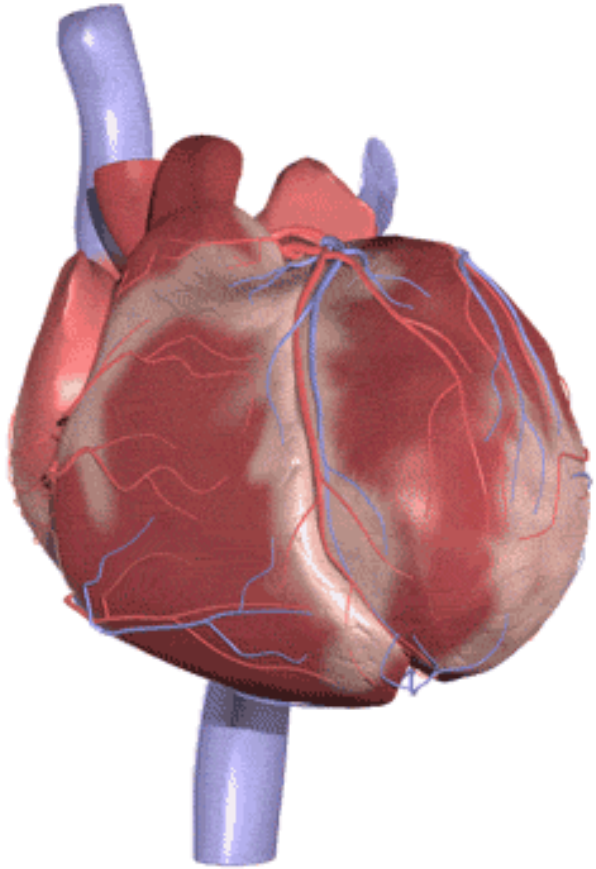
The Actuarial Profession
making financial sense of the future

GIRO 2011: Plenary 4
Domenico del Re & Phil Ellis

Testing the ORSA to extreme events

The ORSA

"The ORSA is the beating heart of Solvency II"



This session is …

- Not another “Introduction to ORSA”
- In two parts:
  - How modelling companies work and learn post event
  - What the ORSA process might look like in practice
- Disappointingly thin on Physics

http://japantsunami2011.wordpress.com/

What challenges do you face?

- Email from CEO “Hi John, bad news, when will we know what our loss estimate is?”
- Press releases from modelling agencies:

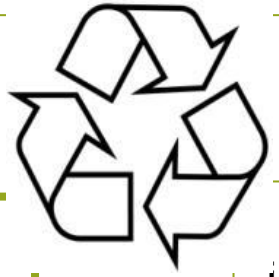
> **“.....** estimates total insured **losses** at **$12 - 25** Billion USD.....”
>
> or
>
> “.. this translates to a range of between **15 billion** USD and **35 billion** USD .....”

This section will focus on the **modelled loss estimates,** use the Tohoku EQ to show the **tools** from modellers and **uncertainties + MI and post-event world**

Sources of loss estimates vary with time

Benchmarking to market losses
through market share, local insurance association experts

Pros/Cons:
Can be poor comparison to own book
Does not identify “private catastrophe”



Vendor models with modelling parameters provided by vendor

Pros/Cons:
Immediate answer
Incomplete model scope
Multiple sources of modelling uncertainty

Own estimate from underwriting judgement, early accumulation of own exposure and claims development patterns

Pros/ Cons
Better for small number of locations
No local presence?
No loss experience, emerging market?

Cat models are for probabilistic loss estimates

But components can be used for single events:

1. Event footprint (i.e. How large/strong is the event)
   - EQ: USGS, local agencies
   - Wind: MeteoFrance, Met Office, Japan Met Agency, some mobile wind stations in US
2. Pick similar events from the model stochastic event set
3. Share selected events with users (often weighted)
4. Apply industry and own company exposure
5. Loss range (+ unmodelled losses)

Model scope is [illegible]s estimates

Data from field

But comp[illegible]nts can be used for single events

1. Eve[illegible]otprint (i.e. How large/strong is the e[illegible]nt)
   - [illegible]EQ: US[illegible]
   - [illegible] Wind: M[illegible]pan Me[illegible]gency, some mobile wind stations in US
2. [illegible]ck similar events from the model stochastic[illegible]vent set
3. [illegible]are selected events with users (often w[illegible]ted)
4. A[illegible]ly industry and own company expos[illegible]
5. Los[illegible]range (+ unmodelled losses)

"Continuous cycle of validation"

Update parameters and estimates

Take uniqueness out with field data

- Tsunami/flood is large challenge
- From the field
  - Reconnaissance teams
  - Disaster agency data
  - .. phone-ins on local radio

Galle, Sri Lanka, Jan 2005

Kao Lak Resort, N. Phuket Source: EEFIT

Geospatial data has made great leaps

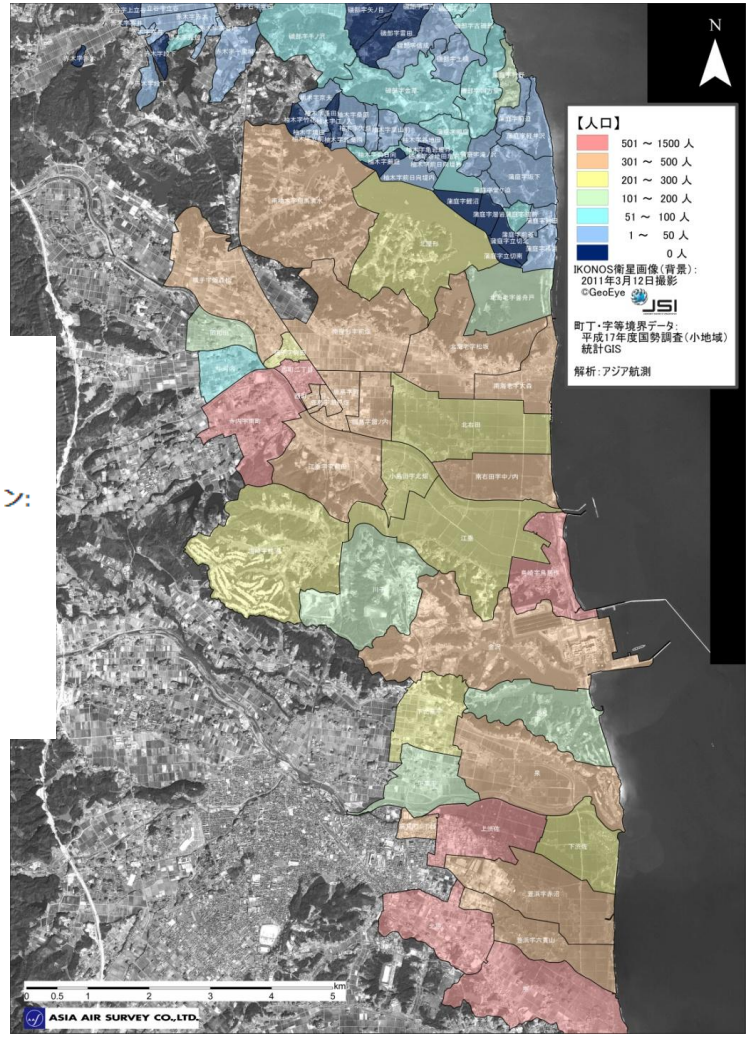
- Tsunami accumulation maps

GDMS 防災情報マッシュアップサービス研究会
Geospatial Disaster management Mash-up Service Study

津波浸水範囲（平成23年4月22日更新）

カテゴリ: 津波データ
公開日: 2011-04-22 21:26　サイズ: 321.57 KB　バージョン:
MD5: ee7e05343af98b4b70e408be2993d24a
提供者: Admin　Web: http://113.37.94.100/gdms
評価: 0.00　ダウンロード数: 368

DOWNLOAD



- Derive accumulations zones for flooded areas
- Kmz files direct on Google Earth

Extrapolate from Japan Disaster Agency Data

- Drill into the model assumptions to update aggregate losses
- Find granular benchmarks to past experience

別紙１

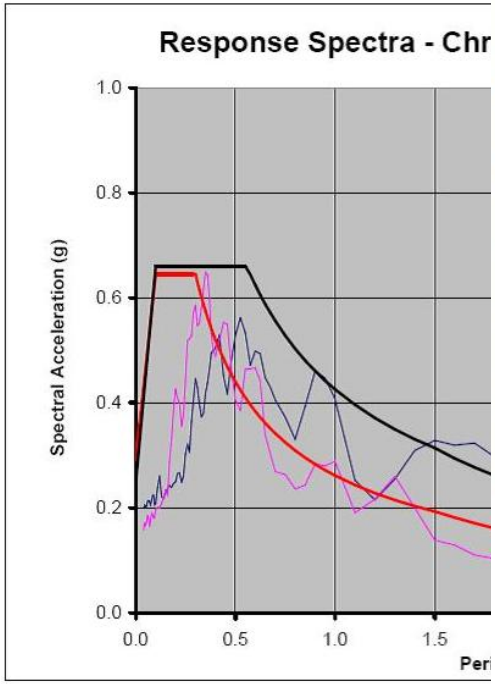
台風１５号による被害状況について

都道府県名	人的被害				住家被害					非住家被害		崖くずれ
	死者	行方不明者	負傷者		全壊	半壊	一部破損	床上浸水	床下浸水	公共建物	その他	
			重傷	軽傷								
	人	人	人	人	棟	棟	棟	棟	棟	棟	棟	箇所
北海道				1			33		1			
青森県				1				143	76			
岩手県	1			2	2	1	5	91	101	1	7	24
宮城県	2			1	3	1	6	363	969		1	94
秋田県												1
山形県												

FDMA Sep.26 2011 16:00 JST					
	# of damaged Houses			# of Flooded Houses	
	Collapse	Half Collapse	Partially Collapse	above the floor	under the floor
Hokkaido			33		1
Aomori				143	76
Iwate	2	1	5	91	101
Miyagi	3	1	6	363	969

Still lessons to be learnt

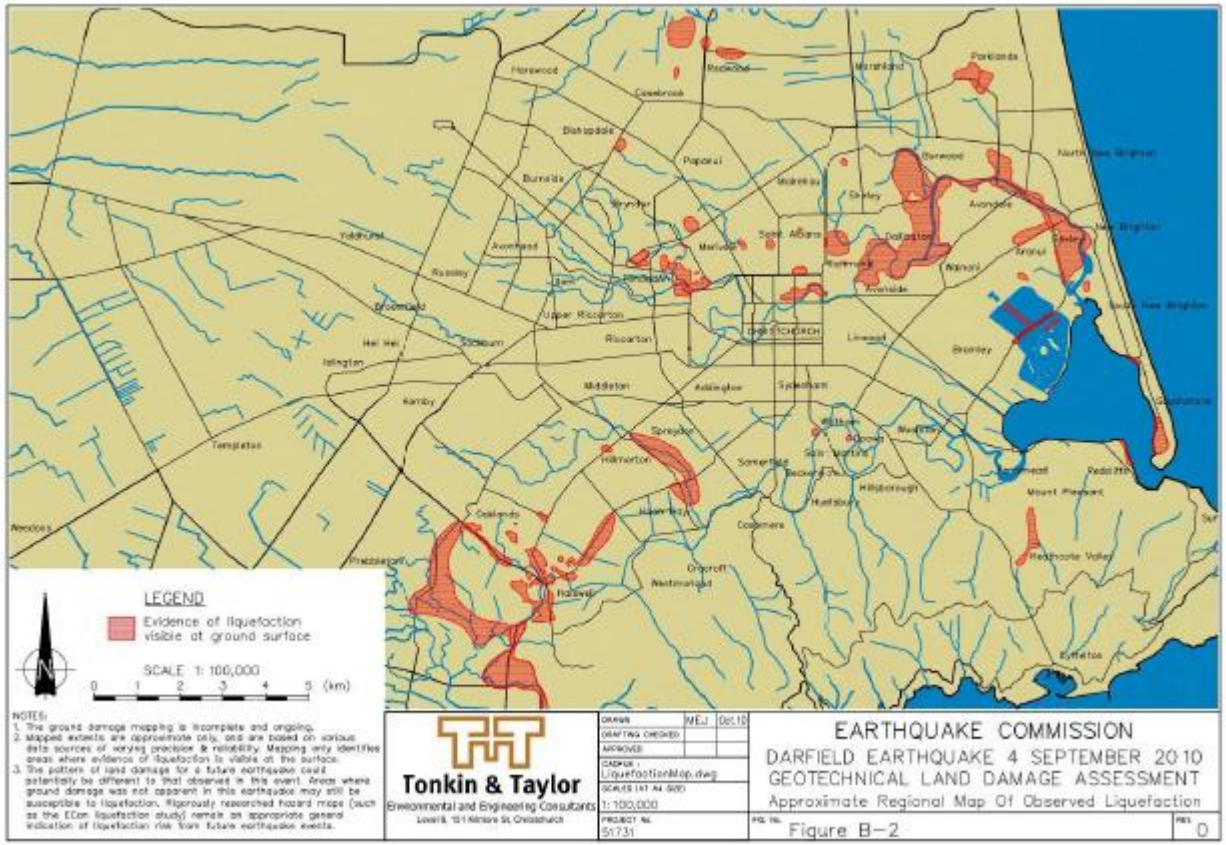
- Earthquakes, as do storms, kick up surprises
- Take example of New Zealand, Sept 3rd 2010



"FORCE"

PERIOD OF

http://mceer.buffalo.edu/research/reconnai
reports_steel.asp



www.**tonkin**.co.nz/canterbury-land.../T&T-Stage%201%20**Report**

Loss estimate uncertainties (partial list)

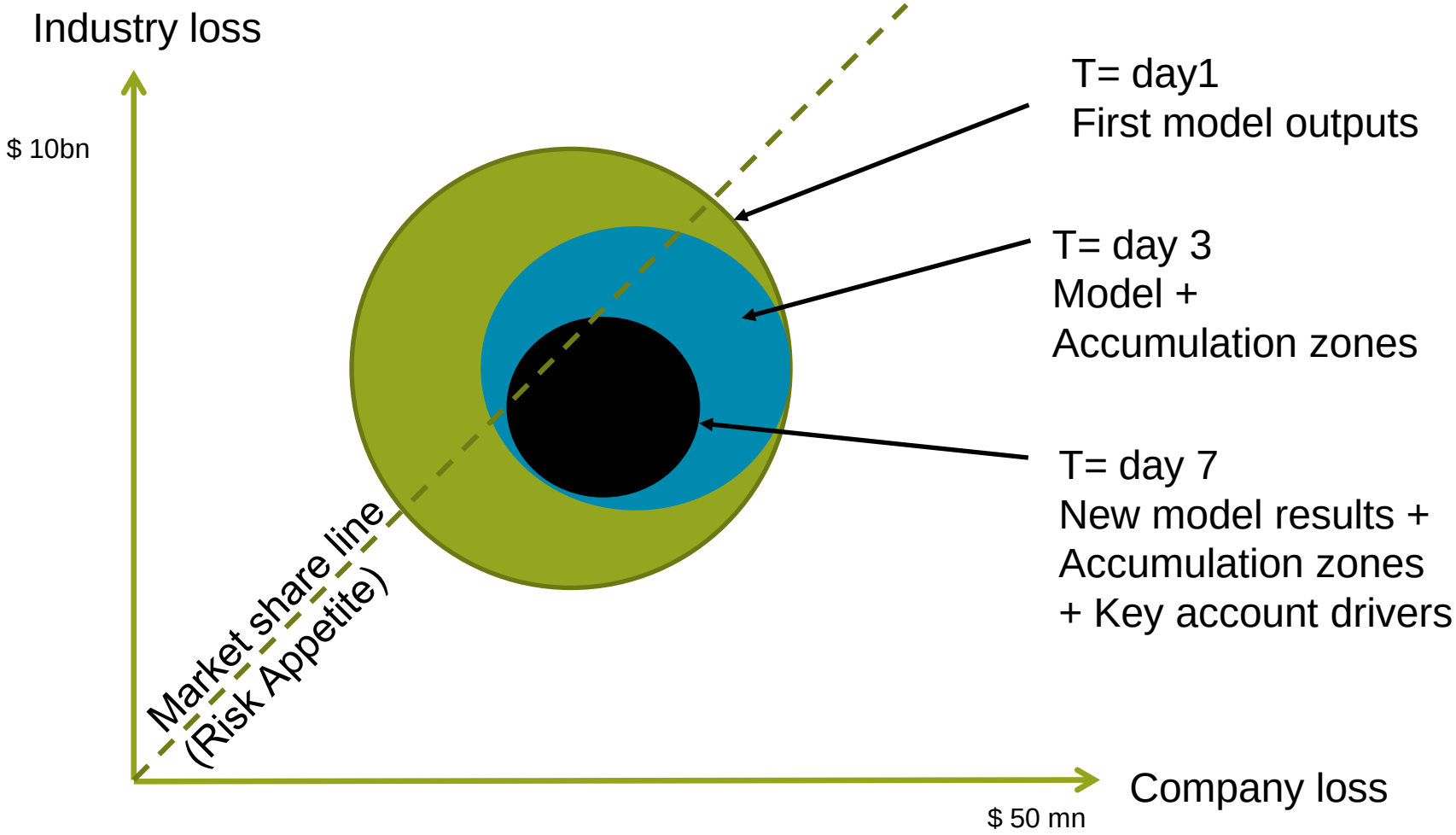
You are responsible for:

- Completeness of data
- Accuracy of data (JP multi-location policies)
- Data appropriate to model
- Non-modelled endorsements (CBI)
- Using your past experience

You rely on modellers for:

- Completeness of event footprint
- Sub perils? (flood/ surge)
- Non-modelled factors? (tree fall, power outage)
- Loss amplification (political/ societal)

When to go public?



Industry and Company Losses Normalised To Market Share (e.g. 0.5%)

Post event ORSA world

Phil will mostly pick this up ...

- Modellers response
  - Incremental learning – things we knew but were difficult to model – physical (flood/ surge/ tsunami), economical/ financial (CBI, BI, Political response)
  - Time lag to change in models. What is proportionate?
- Change in model use in management/ ORSA
  - Change in confidence/use of models?
  - Do I have to update my RDS/ stress scenarios? Aggregations for emerging risks?

Now come forward a few years

- Solvency II implementation is a warm, happy memory
- Let's look inside a good London Market operation

- ORSA process is proportional to risks
  - Quite big risks, so quite big process(!)
- Owned by Board and used in decisions
- Clear organisational responsibility *(… you, the CRO say)*
- Integral to strategy
- Considers both short and long term (out to 3-5 years)

The PONI tale

- Our “PONI” process is well established
  - Intentionally never called “ORSA”
- Quarterly dashboard suite with KRI, KPI, RAG, CAFC
  - Large parts are automated
  - Core elements, seasonal additions, bespoke items
  - Reported to Board for decision making
- Plus planned “In case of emergency break seal” version
  - Generic planning and guidance documents
  - Help to ensure swift, comprehensive approach

Day 1 (1) – Our people

Our people

- Are any staff directly affected?
  - Permanently based in the area
  - Visiting (business or holidays)
  - Agents
- If so, are we doing all we can?

Day 1 (2) – Size of loss

- Initial guess of likely impact
  - Class(es) affected
  - Coverages, perils, wordings, … uncertainties?
  - Unexpected clash potential?
  - Zonal aggregates and underwriting limits
  - Largest contracts exposed
  - Plausible PML percentages
- Worst plausible case
- Range of possible “central estimates”

Day 1 (3) – Solvency Position

- Need to demonstrate continuous solvency
  - Big picture liability position, given size of loss guess
  - Immediate asset impact?
  - Impact of/on reinsurance
- Do we need to talk to regulators?
- Can we continue to underwrite as expected?
- Do we need other immediate changes:
  - reduce asset risk?
  - seek additional reinsurance?
  - request parental or shareholder support?

Day 1 (4) – Investment Position

- Quantify immediate impact on our assets
- Consider investment risk appetite, given
  - Own position on solvency, etc
  - Investment market reaction (over-reaction?)
  - Likely government responses
- Stochastic models with various sensitivities
- And scenario based models
  - Including reinsurer delays or failures
- Liquidity & matching more a focus than normal

Day 1 (5) – Communication

- Consider need to communicate
  - In house, to key staff
  - To significant market counterparties
  - To shareholders and other stakeholders
- Unlikely to need to put anything out this early
  - But assess the need, and be prepared to

Day 2 – Second order effects

- Anything we may have missed so far?

Possible examples:

- Impact of event on prospective reinsurance,
  - e.g. if our main cover is blown, then future RDS events are higher net unless we buy more R/I
  - e.g. if we've an inner aggregate and lots of sideways cover then future RDS events are now lower net
- Others …

Week 1

- Revisit all of the above
- As information emerges
  - Reports from Cat model companies
  - Information from insureds and cedants
    - Especially pro-rata covers in the case of Japan
  - Own analyses of underwriting portfolio
  - Preliminary intelligence from competitors
  - Possible calls on reinsurers
- Continuous solvency plus impacts on reserving, market & liquidity risk

Weeks 2 & 3

- Revisit all of the above
- As information emerges
  - Reports from Cat model companies
  - Information from insureds and cedants
    - Especially pro-rata covers in the case of Japan
  - Own analyses of underwriting portfolio
  - Preliminary intelligence from competitors
  - Possible calls on reinsurers
- Continuous solvency plus impacts on reserving, market & liquidity risk

ASAP – Strategy

- A big loss may cause us to change our risk appetite
- And have significant impacts on our business plan
  - Potentially all aspects (i.e. whole strategy)
  - Both short term
  - And long term

- The sooner we start to consider strategic implications the better

A strategy checklist might start …

- Underwriting
  - Quantum of underwriting
  - Mix of account
  - Limits / aggregations
  - Individuals involved
  - Cat model usage
  - Expected cat model changes
  - Etc, etc
- Reinsurance
  - Form
  - Retention
  - Limit
  - Quantum
  - Counterparties
  - Collateral / Cash loss clause
  - Etc, etc

Everything impacts on everything – iterate as required

When the dust starts to settle

- Validation & back testing
  - Process
    - Monitoring plans, templates, “lead” indicators, …
  - Operational aspects
  - Impact on SCR and stress tests
  - RDS assessments realistic?
  - Cat models effective, well understood?
  - Was the PONI process effective?
    - Doing the right things, in the right way, at the right time?
    - Evolution should be expected, especially when “run in anger”

But isn't this just ERM …
and aren't the best insurers doing this anyway

- Yes … and yes (in part)

I hope this response looks

- Comprehensive, Organised, Strategic, Holistic, Useful,
- Planned, Evidenced, Documented, etc,

And I know it's not rocket science

(though I would love us to talk to about rocket science sometime)

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An ORSA song
c/o friends at RBS

First we were afraid, we were petrified,

Kept thinking we could never live with ORSA by our side,

But we spent oh so many nights

Just thinking how this could go wrong

Then we grew strong and we learned how to carry on!

Oh no not us, we will survive (Oh yeah!)

…