A perspective on the current state of natural hazard risk management in New Zealand

Kelvin Berryman
Principal Scientist, GM Strategic Relationships
GNS Science
K.Berryman@gns.cri.nz

Overall Assessment Mark: C-

- Not doing too bad but plenty of room for improvement

- **Accept:** do we know what acceptable risk looks like?
  Do we manage this consciously or quantitatively? Are the public in the conversation?

Mark = Fail

- **Reduce**: some progress, but mostly lip service to Sendai Framework best practice (so far)

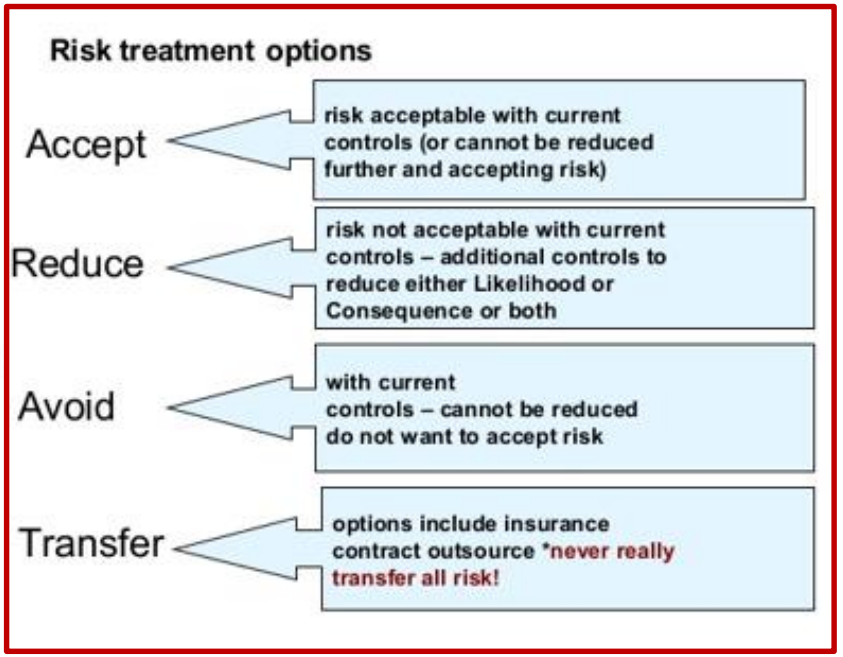
Mark = C

- **Avoid:** plenty of potentially good legislation and guidance but sometimes contradictory; codes and guidance in some areas significantly out of date

Mark = C+

- **Transfer:** pretty good via EQC, NDF, and engagement with offshore insurers/ reinsurers. Perhaps overdoing insurance at the expense of other risk treatment options. Are we getting enough when we need it

Mark = B+

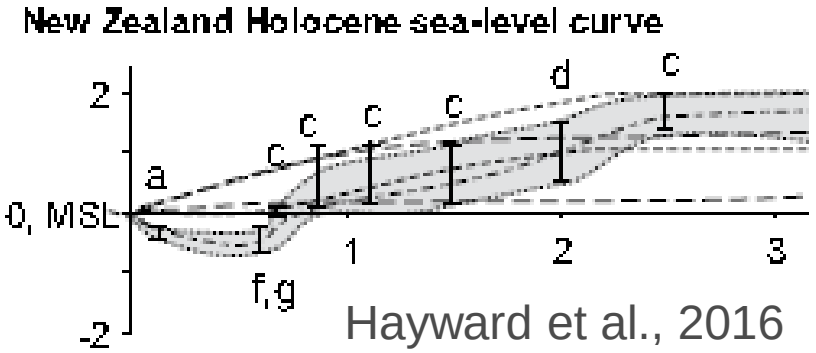


Content – I will support my scorecard with brief comments on:

- Hazard, risk, consequences knowledge and modelling
- Is science being used in practice
- How is our leadership and governance of risk
- What is the capacity across sectors to undertake good DRM
- Use of economic analysis to guide effective investment in ‘resilience’
- Competing issues – eg. natural hazards vs climate change
- Future risks – disruptive technologies, demographics, fake news – the ‘dark-side of globalization’, cascading failures, hybrid threats, cyber ……..are we on top of them?

Hazard Knowledge

- A long track record of producing hazard models
- Still a great deal to learn
  – recent events have thrown up surprises
- Uneven knowledge and uneven modelling of each hazard
  - in Nat Haz earthquake rather better quantified than volcano or landslide
  - probabilistic versus scenario
  - cascading hazards only now being appreciated
  - uncertain cause and effect – rising sea levels doesn't automatically mean faster coastal erosion
  - short historic records make long term forecasting difficult



Hayward et al., 2016

Risk and Consequences

These words need to be at the heart of the science to practice conversation

- The ability to quantify risk is improving rapidly
- Access to data is fundamental to risk modelling
- Direct losses in terms of injury, insured loss, and business interruption are mainstream particularly for scenario events
- Indirect losses such as community/health impacts, and broader economic impacts are currently more difficult

Science to practice

Only a small percentage of current knowledge is used in disaster risk management

Why is this?

- Research results are inaccessible to non specialist audiences – need for ‘translation’
- Research is often driven by academic excellence rather than uptake in the user community
- The user/policy community either not vocal, not influential, not funding research
- Too much information can be an impediment to policy formulation
- Impacts are not presented on a common basis – the testosterone effect – ‘my hazard is bigger than your hazard’
- The user community is afraid of science?

Risk management leadership and governance – Sendai Framework

Indicator	Descriptor	Assessment wrt NZ
28a	Mainstream and integrate disaster risk reduction within and across all sectors	Partial at best. Central Govt agency autonomy inhibits 'mainstreaming'
28b	Adopt and implement national and local disaster risk reduction strategies and plans	No such plans exist
28c	Carry out an assessment of the technical, financial and administrative disaster risk management capacity to deal with the identified risks at local and national level	Marginally in some CDEM group plans, but not in the context of DRM
28e	Develop and strengthen, as appropriate, mechanisms to follow-up, periodically assess and publicly report on progress on national and local plans	No official evaluation, no public scrutiny, accountability not clear
28g	Establish and strengthen government forums composed of relevant stakeholders at national and local levels, such as national and local platforms for disaster risk reduction	Currently only central govt. agencies under National Security Framework – not connected to all-of-government, business and civil society
28h	Empower local authorities, as appropriate, through regulatory and financial means to work and coordinate with civil society, communities in disaster risk management at the local level	Some degree of regulatory encouragement, but no financial incentives. Engagement with the private sector is weak
28i	Encourage parliamentarians to support the implementation of disaster risk reduction through developing new or amending relevant legislation and setting budget allocations	Some shift in focus toward DRM but political engagement limited to MP's or single Minister. No parliamentary grouping

Progress on a unifying national approach – National Disaster Resilience Strategy

MCDEM in development

Capacity across sectors to undertake good DRM

Highly variable

- Overall a tendency to look toward insurance as the panacea
- Local government asset management area quite weak
- I don’t see the 4 levers in risk treatment (accept, avoid, reduce, transfer) used together to find the ‘sweet spot’
- The language in many sectors continues to be hazard rather than risk or consequences – so weak understanding of risk treatment
- Although risk reduction and resilience are at the heart of NZ conversations, risk continues to grow

Economic drivers – investment for 'resilience'

Imperative to put $$$ into the risk reduction investment discussion

- A first step can be determining the cost of doing anything
- What are the likely losses now and in the future without improved risk treatment/reduction reduction/not creating new risk
- The economic costs of events globally are rising much faster than the ability to pay for recover
- Modelling economic losses must include indirect and compounding losses through loss of income (personally & nationally), community and health costs, and 'upstream and downstream' losses due to interdependencies
- ROI of 5-10 on risk reduction investment has been identified in many case studies.

Seismic strengthening costing
$6M million is estimated to have saved Orion $30-50M
in direct asset replacement costs.

Natural hazards versus climate change

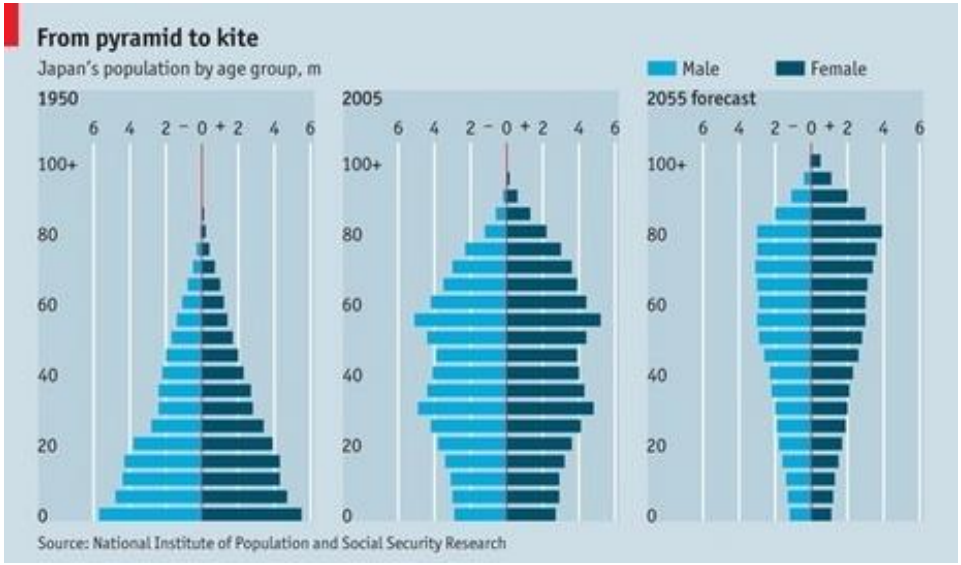
Not either/or but both – part of the current ‘my hazard is bigger than yours’

- A lot of rhetoric at present about the future costs of climate change in isolation of other threats – biosecurity, cyber, natural hazards, pandemic etc etc
- $19 billion of assets said to be at risk from SL rise in next 50 years. Annualised natural hazard losses have been estimated at $5 billion
- Mitigation and/or adaptive capacity are crucial and investment needs to consider all risks and seek co-benefit ROI
- Land use planning is at the centre of creation of new risk – pertinent to natural hazards and weather events alike
- In New Zealand we are surrounded by risk which cannot be reduced to zero
- Key question is ‘what is acceptable risk/impact’ – this isn’t happening

Future risks

Coordinated horizon scanning and information sharing is crucial for management

- disruptive technologies – extreme rate of change
- Aging communities
- fake news – the ‘dark-side of globalization’
- cascading failures
- hybrid threats - an adversary that simultaneously and adaptively employs a tailored mix of conventional weapons, irregular tactics, terrorism, and criminal behaviour to obtain their political objectives – is this happening to us?.



Conclusions

- New Zealand does quite well in DRM but could do a lot better
- We are assisted by geographic isolation, small population, relatively connected and small bureaucracy
- We don't make DRM decisions based on balancing the 4 basic risk treatment options
- NZ agencies do not share data or intelligence to maximise good DRM
- Risk literacy is low and holding us back
- Investment in risk reduction is piecemeal and generally of unknown value without appropriate economic modelling
- New Zealand's future risk is more complex because of interdependencies
- Drive for efficiency with 'just in time' delivery and manufacturing etc is reducing redundancy, backup systems, spare parts etc and resilience is decreasing as a result
- Creation of new risk is occurring without understanding:
  - were hazards considered in establishing special housing areas in 2015?
  - for natural hazards and weather events (coast, river) land use planning, building regulations and cumulative losses needs to underpin acceptable/sustainable development decision making