

Weather-related hazards and coasts on edge

Rob Bell & Richard Turner
NIWA
New Zealand

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Drivers influencing hazards research

- Risk reduction– more emphasis e.g. [Sendai](#), [DPMC](#), [NDRS](#), [EQC](#), [LINZ](#)
- Managing significant risks: matter of national importance ([RMA s 6](#))
- Floods are NZ's No. 1 weather-related hazard – call for action e.g. [Economic Development, Science & Innovation Select Comm. \(Nov 2018\): *Impacts of severe weather – Chasing resilience for NZ \(NIWA submission\)*](#)
- Tools for estimating rainfall runoff and floods e.g. [Envirolink flood estimation](#), [HIRDS v4](#)
- Growing demand for hazard forecasting services (weather + hazard)
- Move to risk-based premiums by insurers + re-insurance + banks
- Robust & defensible guidance ([MfE](#), [NZCPS guidance](#))
- Design codes & protocols for national consistency e.g. [Wind Action code](#), [LiDAR protocols \(LINZ\)](#), [NZ Rainfall & Runoff Guidelines??](#)
- Plus

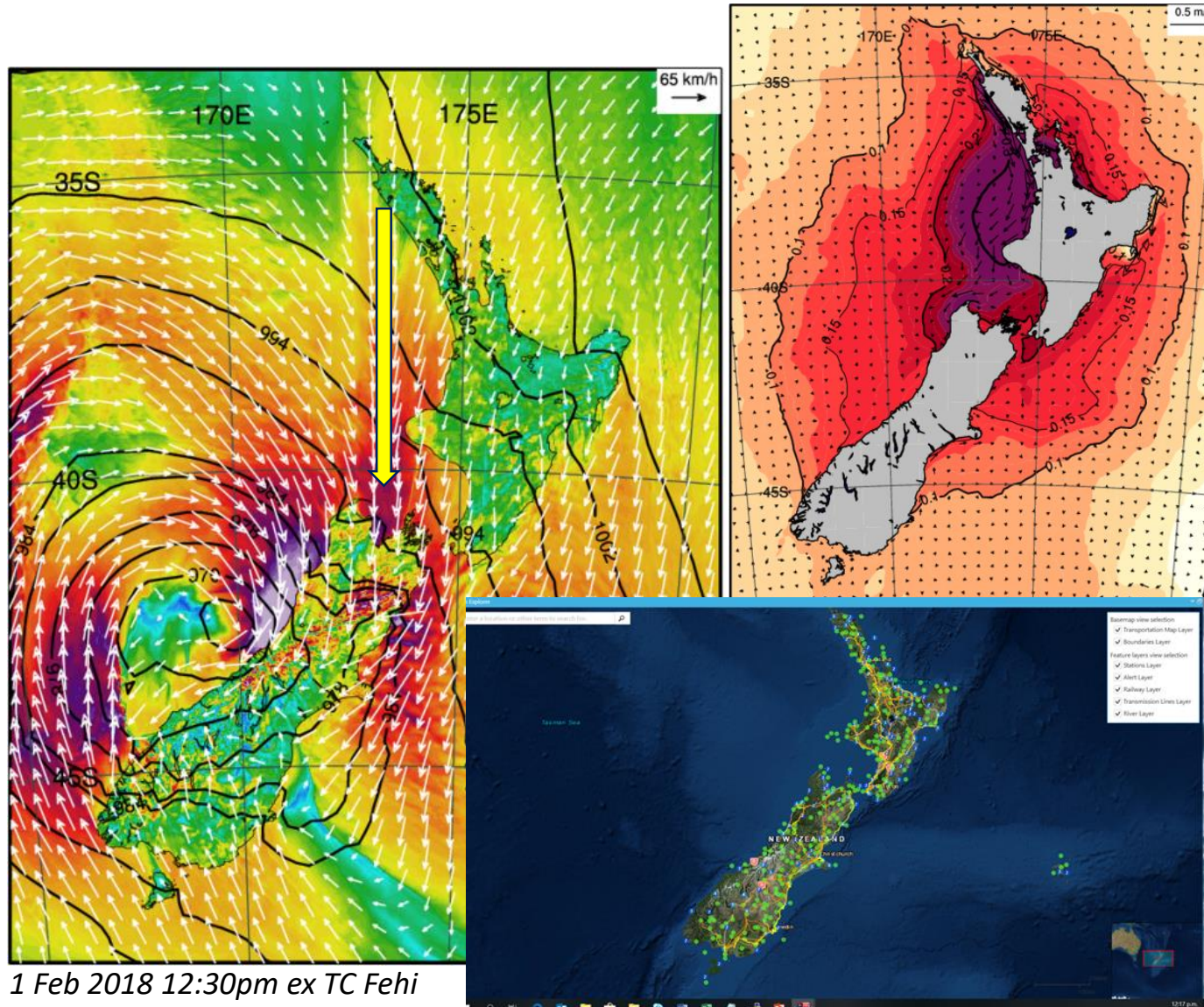


Sven Martin



Alan Blacklock

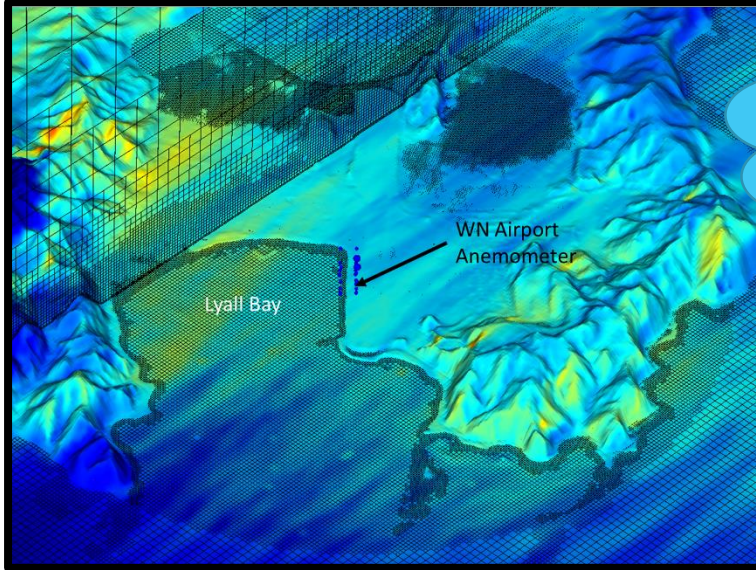
Forecasting weather hazards



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- UK Met Office consortium: developing and improving the Unified Model (UM) – also Regional Climate Model (e.g. [MfE projections](#))
- Developing EcoConnect and National Fire Service operational systems e.g. [2017 Port Hills wildfire](#)
- Focus on “what the weather does”
- Regional diagnostic and evaluation exercises: [DeepWave – Southern Alps](#) (NSF field campaign)
- Ensemble forecasting (improve uncertainty)
- Reanalysis (hindcast & future-casts)

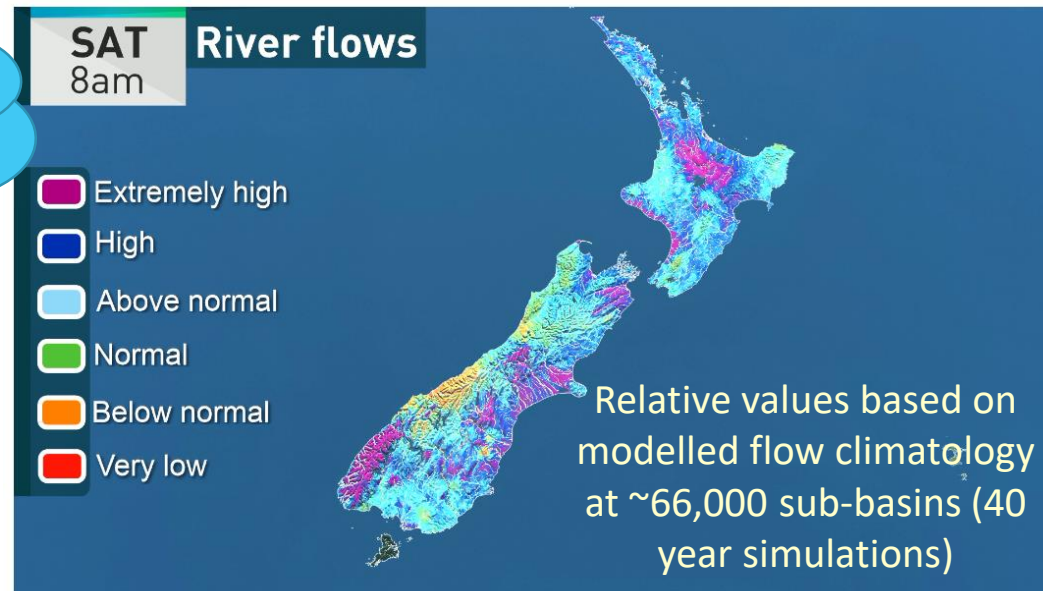
Weather-driven hazards



Wind action code
2020 update:
ASNZS-1170

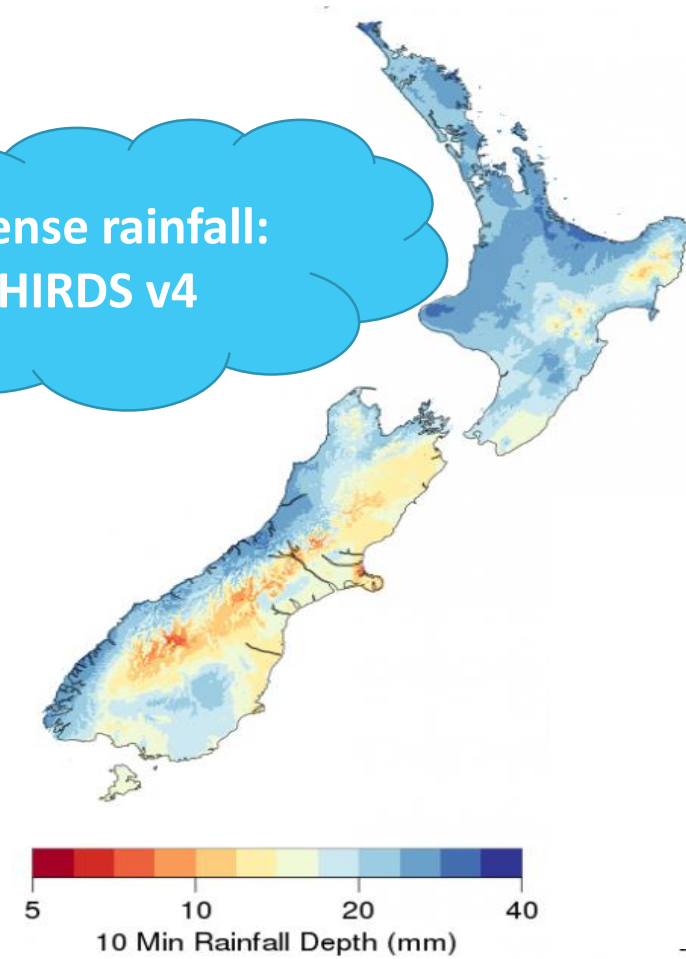
Improved hill-shape and
downslope multipliers: 1.5 km
NZCSM simulations – Wgtn
(with Wsp Opus)

National
categorical flow
forecast model

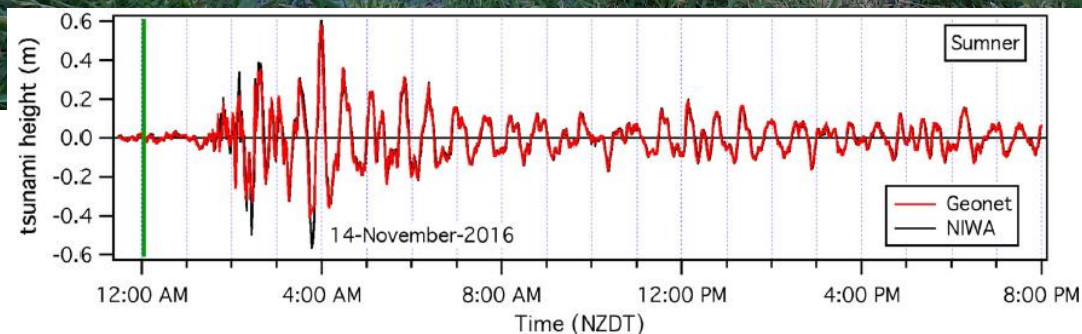


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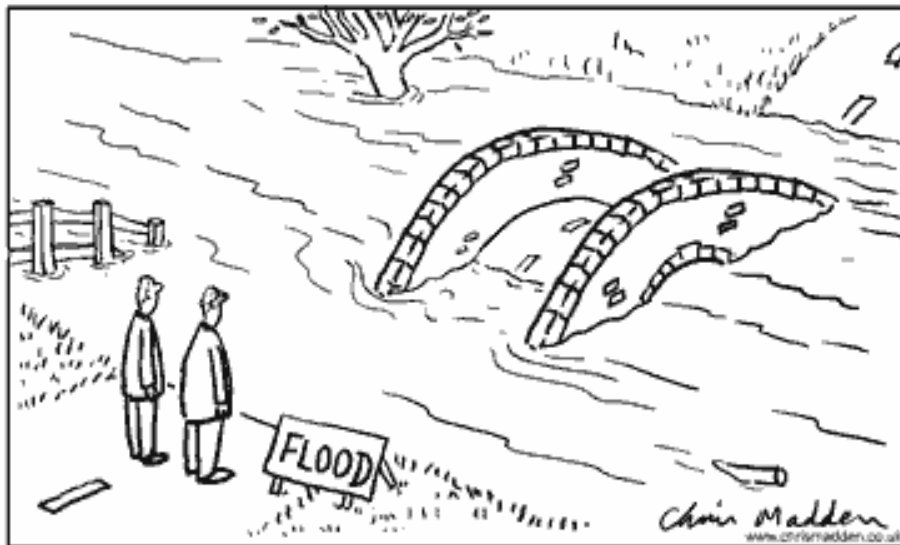
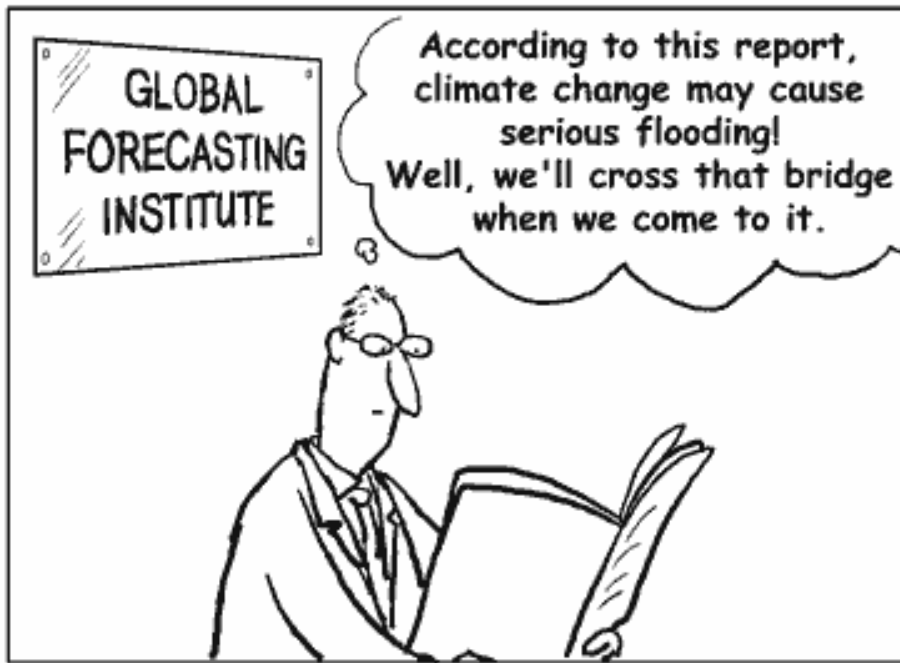
Intense rainfall:
HIRDS v4



Coasts: On edge



- Red-alert high tide calendars
- Tsunami: TEP and submarine landslide source mapping & modelling
- Sea-level network – open coast since 1994 + Moturiki (now 45 yr record)
- Coastal calculators – joint AEP levels for wave setup, runup and storm-tide
- Waves and storm surges – present + future (Univ Auckland led)
- National scale coastal risk exposure (PCE- 2015 and Deep South- 2019)
- New EEZ Tidal Model (Joining Land & Sea – LINZ partnership)



Herd of elephants ?



R Bell, NIWA

Groundwater
rise & salinity



R Bell, NIWA

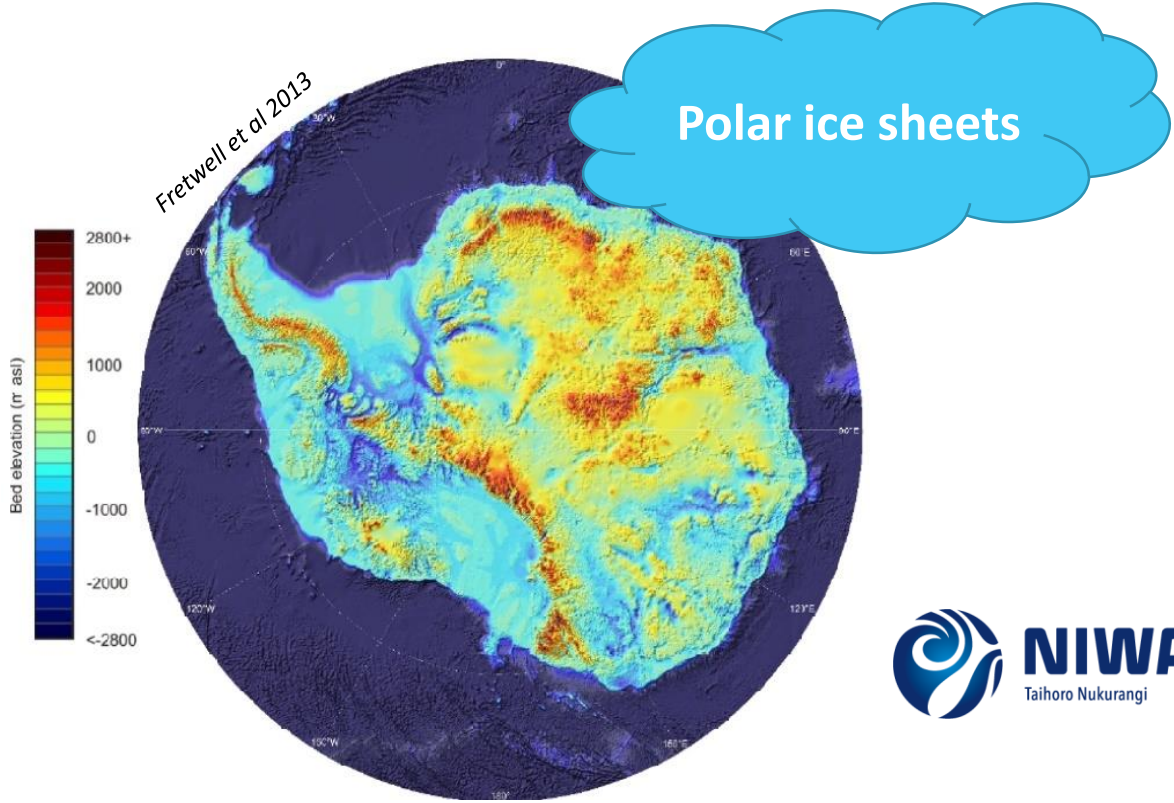
Environmental
change

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Chris Heeley New Lynn, Mar 2017

Intense rainfall:
flash flooding &
landslips



Polar ice sheets

Research Strategies or Think Pieces

Priority 5: Hazard Risk Management *Regional Council RS & T Strategy 2016*

- Better tools to address hazards, interpret 'risk', and reduce consequent societal risks
- Ascertain the recommended resolution of topographic data for hazards identification and evaluation (e.g. LiDAR)
- Forecasting rainfall events to improve community response to floods
- Understanding future geomorphological change to improve the long-term outcomes of flood management decisions

Hazard Risk Management *LGNZ, Insurance Council NZ (2014)*

- Support risk-reduction emphasis – consistent information
- Development of national/regional level data, tools and guidance
- More research on flooding hazards and increasing intense rainfall
- Prioritize hazards through proper risk analysis (+ climate change)
- Multi-hazard (compound) and cascading hazards

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Managing natural hazard risk in New Zealand – towards more resilient communities

A think piece for local and central government and others with a role in managing natural hazards

October 2014



Thank you

Rob Bell (PhD, CPEng, CMEngNZ)

+64 27 2332324

rob.bell@niwa.co.nz

