

# Extreme weather, climate change, and weather-related EQC claims

Professor Ilan Noy, Dr. David Fleming, Jacob Pástor-Paz & Sally Owen  
contact: ilan.noy@vuw.ac.nz

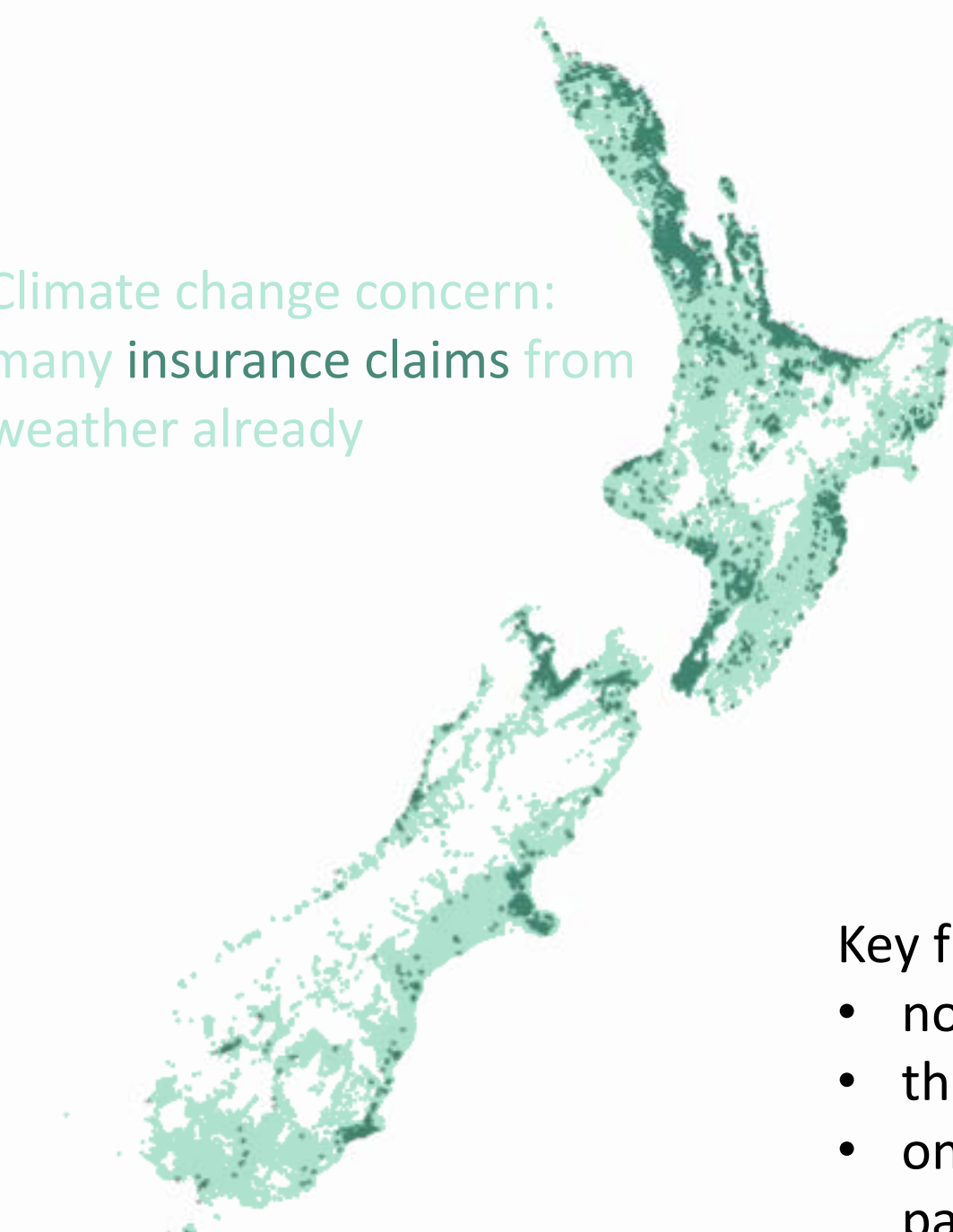
## part one: past trends in weather-related insurance

The Earthquake Commission (EQC) insures all New Zealand home-owners who have private insurance cover for residential fire damage, including insurance for some damages by storm or flood, and landslips.

These weather-related claims have implications in the context of climate change. We explore EQC claim and property data to investigate patterns in weather-related claims from 2000-2017.

We also examine the Historic Weather Events Catalog (NIWA), neighbourhood demographic and socio-economic information from the NZ Census (Statistics NZ), geo-spatial terrain and hydrological features (LINZ), and aggregated private insurance payments for each weather event (Insurance Council NZ).

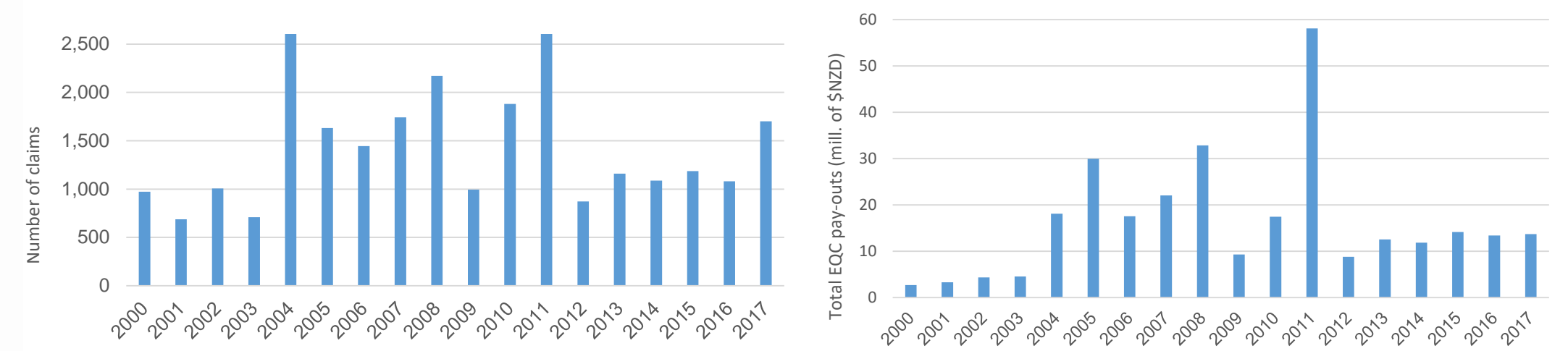
Climate change concern: many insurance claims from weather already



Properties in NZ - darker points represent landslip/storm/flood claims to EQC between Jan 2000 and March 2018

Since 1980, EQC has received over half a million claims. Around four percent of these have been classified under the "landslip/storm/flood" category. This represents more than 26,000 claims paid by EQC as a consequence of weather shocks in the last 18 years. These have a total value close to NZ\$ 300 million.

There is no upward trend yet emerging in number of weather related-claims or amounts paid.



Key findings include...

- no clear upward trend yet emerging in the number of claims or their value
- the northern regions of both islands are the source of most claims
- only a handful of weather events caused a large proportion of EQC's weather-related pay-outs
- the average property lodging a weather-related claim is twice as close to the coast as the national average
- properties with claims are cited on steeper land than the typical property
- higher income neighbourhoods appear to be those most benefiting

## part two: impact of insurance on local economic recovery

We investigate weather-related claims to measure the impact of public insurance on recovery from weather related events.

The dynamics of short-term local economic recovery from disasters are globally under-researched. Why? It has been difficult to measure recovery - consistent, frequent and spatially disaggregated indicators of economic activity have historically been rare. However since 2012, NOAA publishes global average night-time light radiance monthly, a useful proxy.

We use night-time light to analyse three extreme weather events between 2000-2017. We include only households which were exposed to the extreme weather hazard - specifically those which experienced over a threshold of rainfall during the event, using observed precipitation data (NIWA).

$$\text{recovery}_i = \alpha + \beta_1 \text{damage}_i + \beta_2 \text{claimed}_i + \delta X_{1i} + \varepsilon_i$$

- *recovery* denotes the difference in nightlight (NL) from two months after the event
- *damage* is the difference in average night-time radiance in the month of the loss
- *claimed* is an indicator for whether an EQC claim had been made against the property for that event
- $X_1$  is a vector of property, geographic and hydrological control variables

	Dependent variable: recovery					
	June 2015 Storm		November 2016 Flooding		March 2017 Storm	
	(1)	(2)	(3)	(4)	(5)	(6)
damage	-0.527*** (0.002)	-0.419*** (0.005)	-0.091*** (0.005)	-0.084** (0.035)	-0.612*** (0.001)	-0.513*** (0.002)
claimed	0.565*** (0.069)	-0.087 (0.156)	0.732* (0.410)	-0.0182 (0.304)	0.612*** (0.184)	0.009 (0.089)
slope	-0.018*** (0.001)	0.005*** (0.002)	-0.068*** (0.002)	-0.009*** (0.002)	-0.017*** (0.002)	-0.025*** (0.001)
other controls	YES	YES	YES	YES	YES	YES
constant	YES	YES	YES	YES	YES	YES
sample	over 50mm	over 100mm	over 50mm	over 100mm	over 50mm	over 100mm
observations	156,090	18,036	40,059	4,388	574,761	108,224
Adjusted R <sup>2</sup>	0.379	0.046	0.060	0.087	0.326	0.321

Note: \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Key findings:

- EQC claimants being present in the community are correlated with stronger recovery across areas which moderately experienced the event
- this effect diminishes when we isolate those properties which experienced the event more intensely

Extreme weather and nightlights: recovery not linked to insurance

We are grateful to the Impacts and Implications Programme of the Deep South National Science Challenge for supporting this work.

### Further reading...

Fleming, Noy, Pastor-Páz & Owen (2018) Public Insurance and Climate Change (part one): past trends in weather related insurance in New Zealand. Motu Working Paper Series.

Noy, Owen & Fleming (forthcoming) Public Insurance and Climate Change (part two): Measuring the Impact of Insurance on Residential Recovery using Night-Lights. School of Economics and Finance Working Paper Series, Victoria University of Wellington

National  
SCIENCE  
Challenges

THE DEEP SOUTH

Te Kōmata o  
Te Tonga