



Creating resilient rural value chains in the 'Top of the South', New Zealand

Jo Fountain, Lincoln University

Nick Cradock-Henry, Manaaki Whenua Landcare Research

RESILIENCE
TO NATURE'S
CHALLENGES

Kia manawaroa
– Ngā Ākina o
Te Ao Tūroa

National
SCIENCE
Challenges



Manaaki Whenua
Landcare Research



LINCOLN
UNIVERSITY
TE WHARE WĀHAKA O AORAKI

Introduction



- Exposure to risks and hazards – earthquakes, extreme weather events – have significant impacts for rural regions in NZ
 - Populations are small and often dispersed over large areas
 - Critical infrastructure and lifelines may pass through highly exposed areas, making them vulnerable to failure
 - ‘hollowing out’ of rural regions through depopulation, loss of services decreases capacity for responding to disasters.

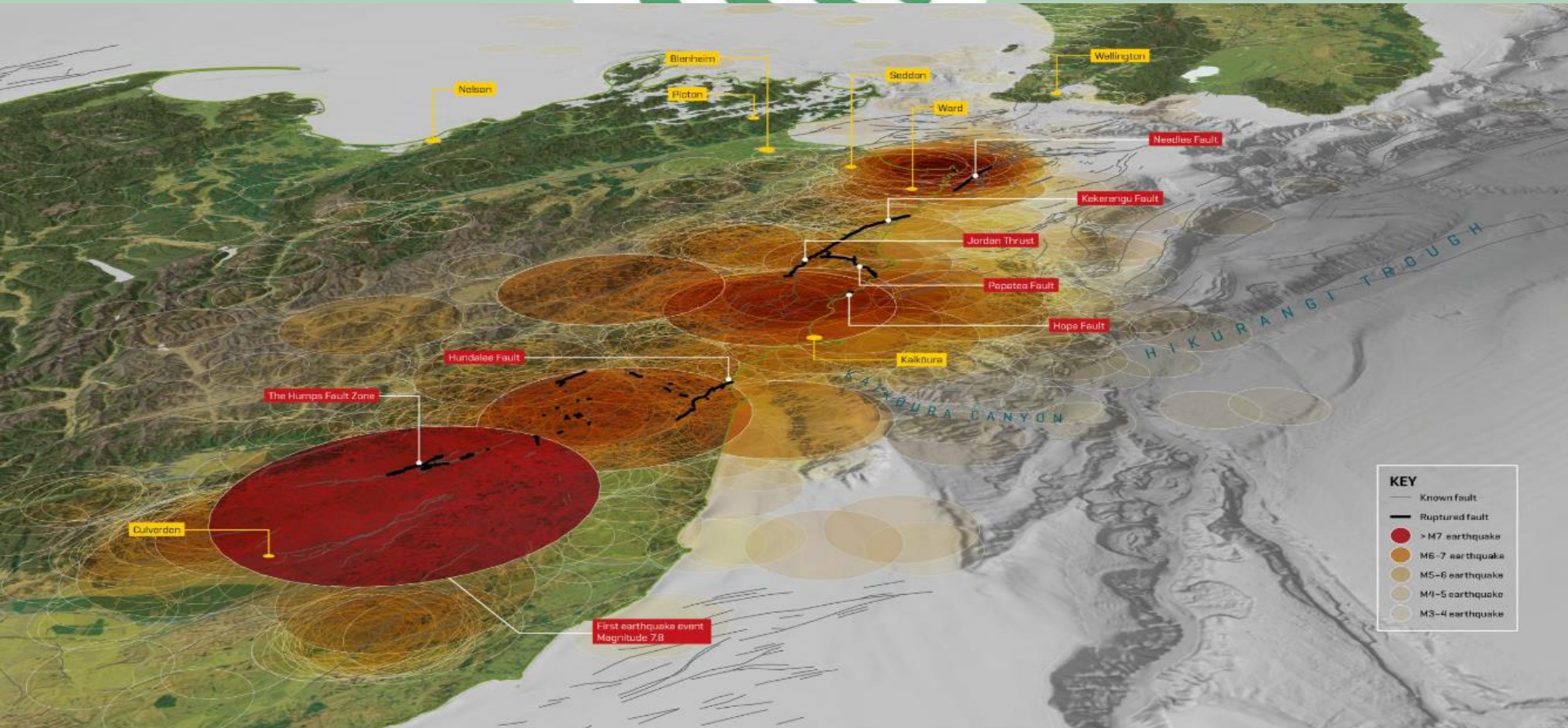
Introduction



- Cascading and compounding disruptions affect flows of agricultural products and tourists
- Flexible and adaptive response mechanisms along the value chain are required for long term recovery trajectories
- 2016 Earthquake response case studies:
 - Kaikōura food value chain
 - Marlborough wine industry



November 14 2016 Earthquake



November 14 2016 Earthquake



- The 14 November Kaikōura-Hurunui earthquake struck just after midnight
- 7.8 M_w event saw 21 faults ruptured and 80-100,000 landslide events
- Serious and significant impact on logistics
 - Blocked roads, dammed rivers (creating significant flood risks)
 - Surface faulting disrupting critical infrastructure including roads, rail and ports

Kaikōura: a vulnerable destination



- Kaikōura is significantly reliant on tourism
 - 34% of district's GDP from international tourists
 - In town, 80% of businesses cater to international visitors to some extent
- 2016 Earthquake occurred at the start busy tourism season
 - Many of those in township were visitors
 - Road access cut stranded tourists
 - 1200 evacuated; 300 rental vehicles abandoned



<https://www.radionz.co.nz/news/national/256670/top-award-for-whale-watch-kaikoura>

Kaikōura: a vulnerable destination



- Lack of diversity in local economy
 - Milk factory closed
 - No local meat processing facilities
 - Compliance issues
- Isolation exacerbates issues



Earthquake impact on Kaikōura tourism



- Massive impact on visitor numbers
- Changing characteristics and patterns of visitors – e.g. engineers and road repairs
- Hospitality businesses had government subsidies, but no customers



Transforming rural futures



- *“To be honest, Kaikōura could have survived [on local food] for a long time quite happily if we had been a bit more organised... [if we were] able to get round any rule”*
- *We had shops that would sell two cups of coffee in a day, \$8 dollars worth, it cost \$100 to keep the staff there, day after day, but we kept it open*
- Locals recognised potential to transform rural futures:
- Getting organised; strengthen networks
- Getting around rules: *“thinking outside the square”*



Reimagine Kaikoura
Pōhewatia anō a Kaikōura

A sustainable future for the Kaikoura District

Ongoing transformation? ?



- Harnessing/extending existing relations and social capital can create adaptive response mechanisms
- Barriers to ongoing transformation
 - Return to existing ways of doing things
 - Globalised supply chains & rationalisation of processing facilities

Three years on from 7.8M earthquake, is Kaikōura just as vulnerable?

Alice Angeloni • 12:05, Nov 13 2019



BECKY WILSON/STUFF

Kaikōura was picked as a perfect "case study" four months before a 7.8-magnitude earthquake hit.

Rebuilt and resilient, but, three years on, is Kaikōura any better equipped to deal with another massive earthquake? Alice Angeloni reports.

In mid 2016, a team of researchers set about looking for a "case study", to explore how a remote community would or could respond in a natural disaster.

Kaikōura was perfect, they thought. They were right.

The coastal town had a small population, was reliant on tourism and agriculture, had a "lifeline highway", and was set in a "dynamic, multi-hazard" landscape.

<https://www.stuff.co.nz/national/117034044/three-years-on-from-78m-earthquake-is-kaikura-just-as-vulnerable>

The Marlborough wine industry



2016: A SNAPSHOT

- 2016 Marlborough vintage 326,000 tonnes, ca 235 million litres
- Marlborough accounted for 76% of national production across all varieties, 72% of all Sauvignon Blanc produced in New Zealand
- 2016 vintage was 39% up on the previous year

TOTAL PRODUCING AREA **36,192 HA**

TOTAL PRODUCING AREA BY VARIETY

RED **7,960 HA**

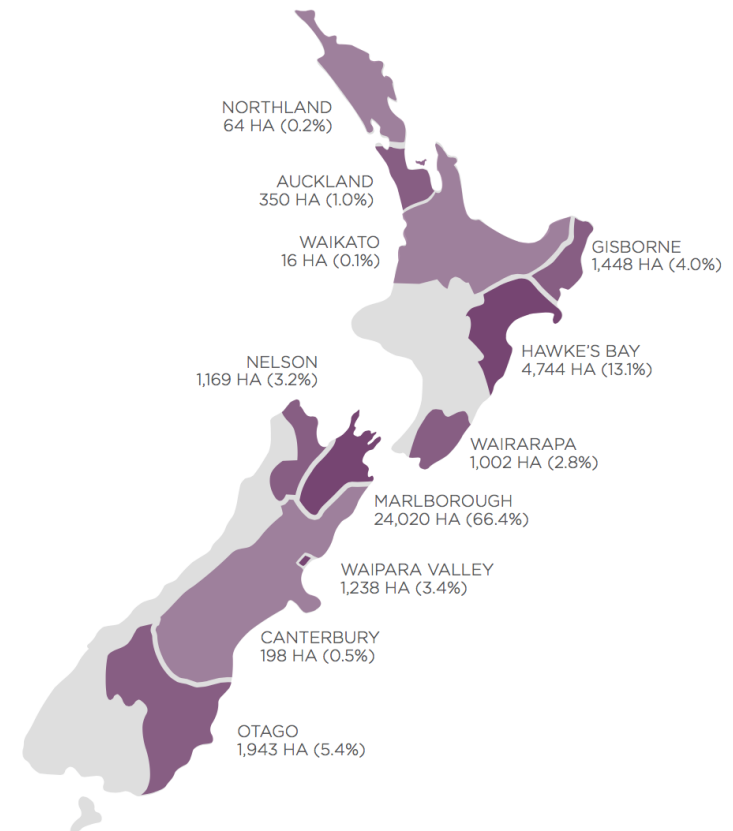
WHITE **28,231 HA**

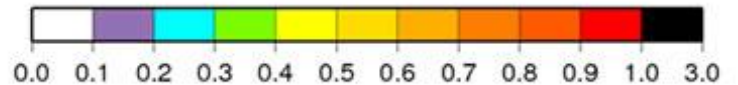
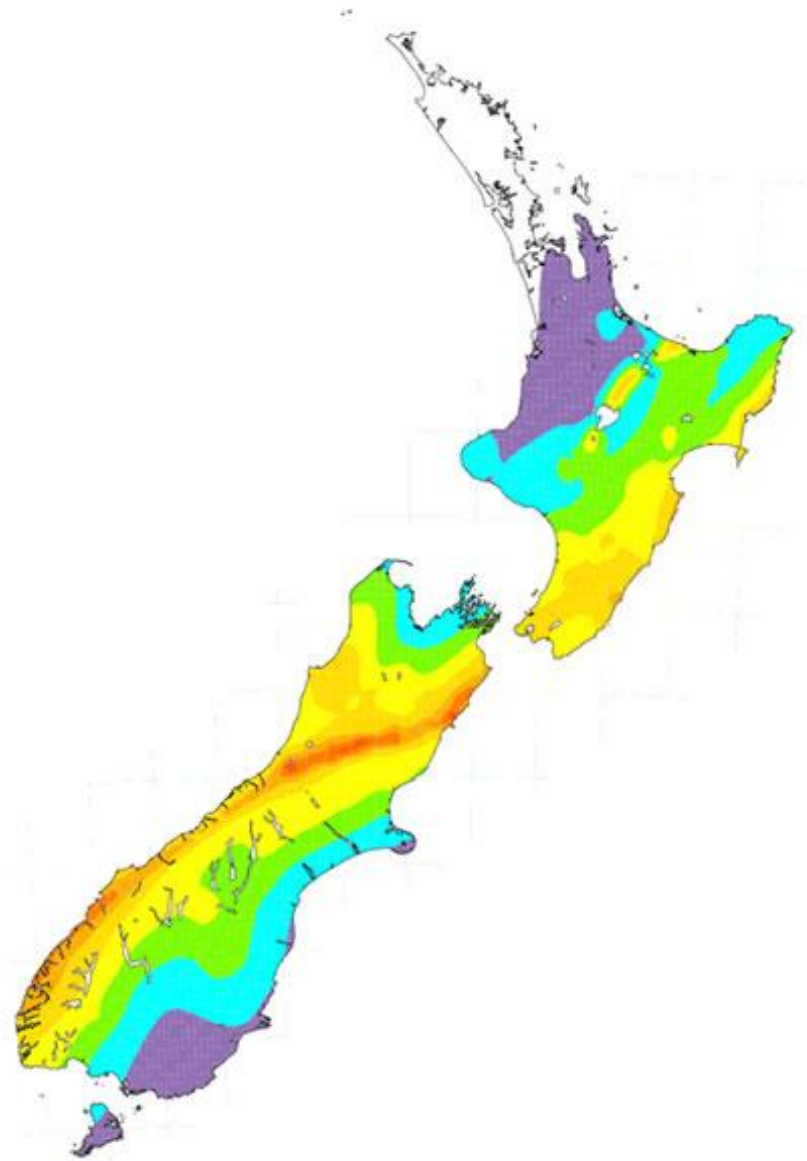
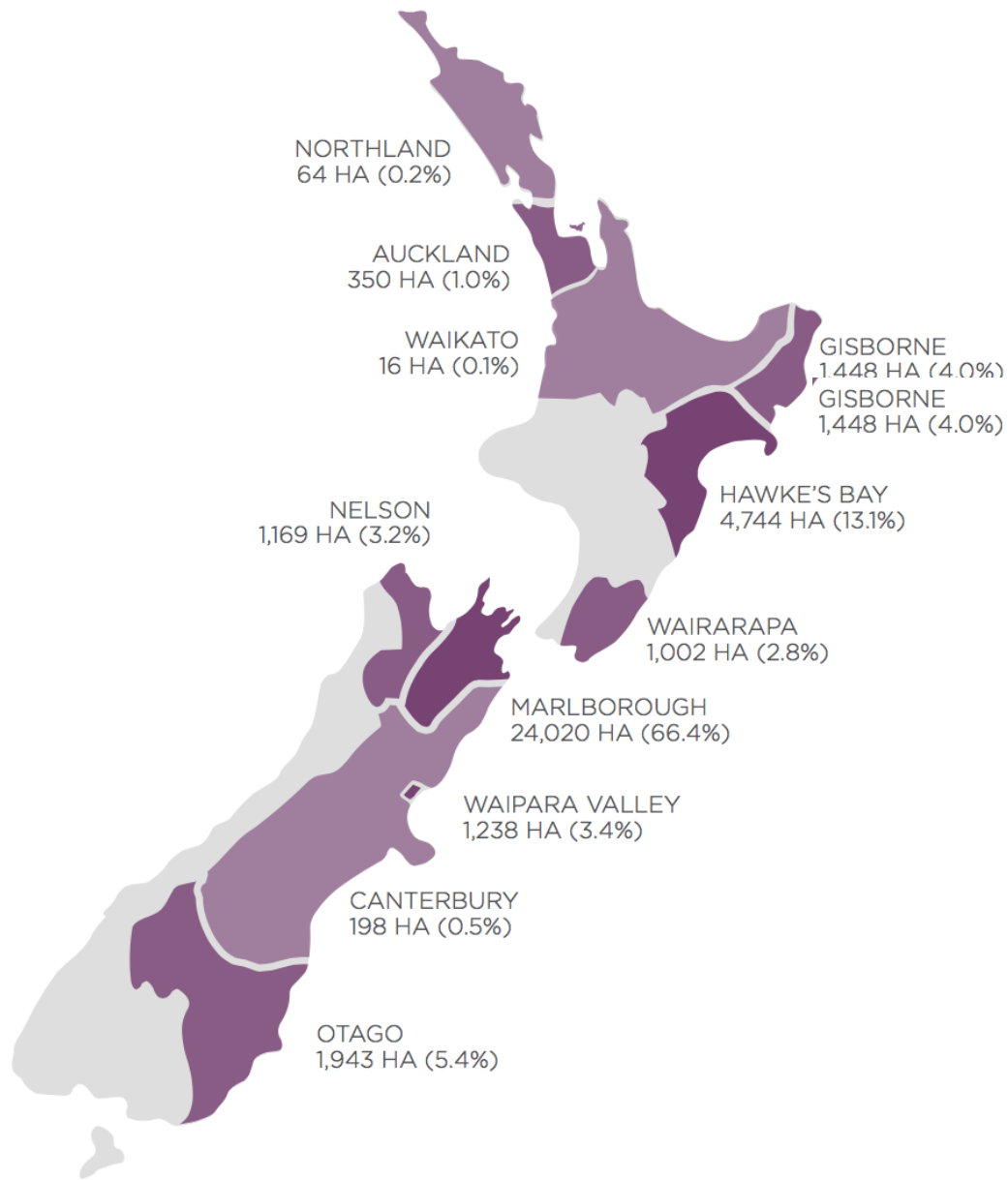
PRODUCING AREA OF SAUVIGNON BLANC **21,016 HA**

NUMBER OF VINEYARDS **2040**

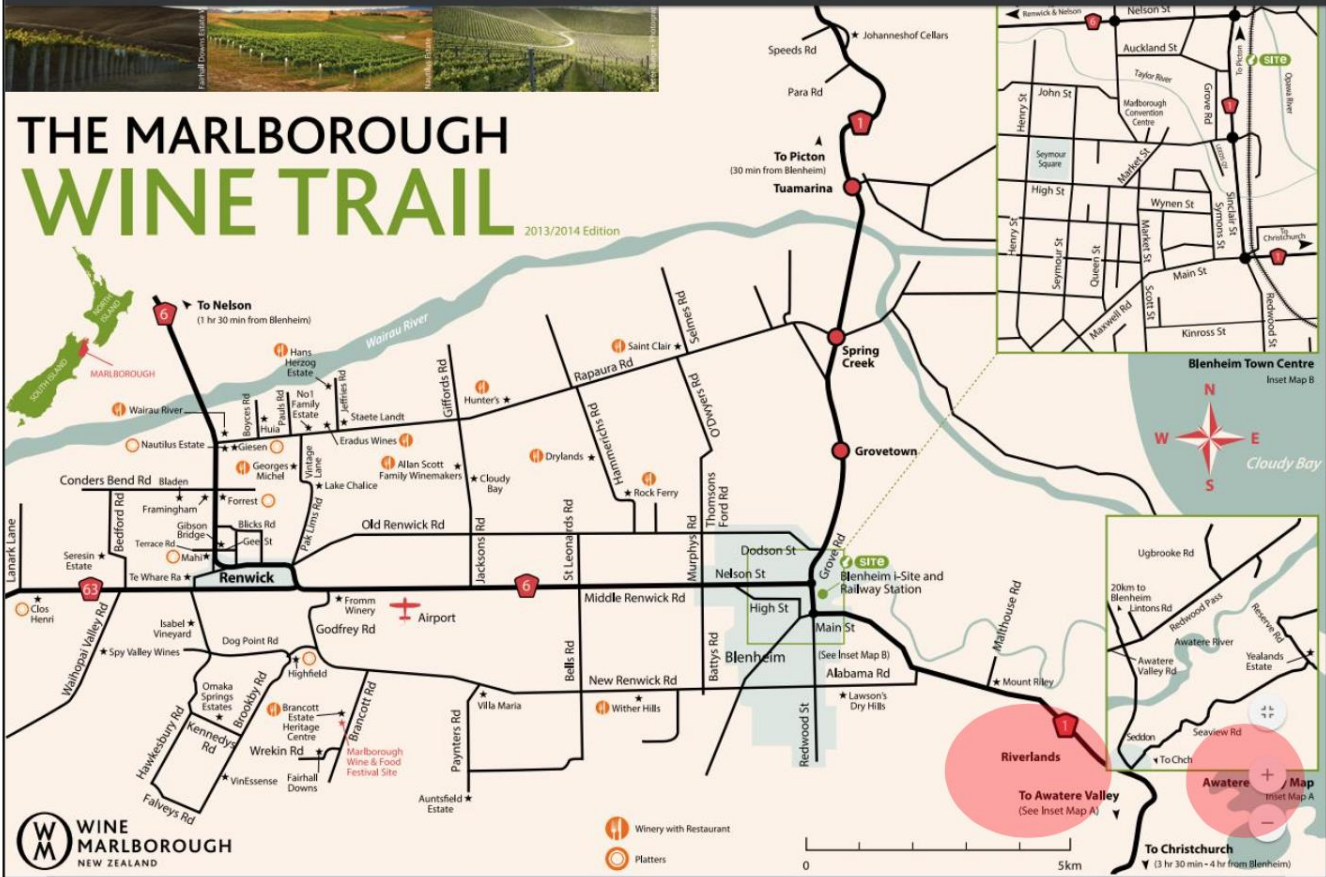
AVERAGE AREA OF VINEYARD **17.4 HA**

2016 PRODUCING AREA BASED ON PROJECTIONS SUBMITTED IN 2015 VINEYARD REGISTER





PGA (units of g) with a 10% probability of exceedance in 50 years on Class C (shallow soil) sites



- Most wineries experienced moderate to severe shaking
- Riverlands zone ca. 65% of processing capacity for region; heavily impacted
- Zones impacted in 2013 quake also impacted heavily by 2016 quake

Impacts on the wine industry



- Wine loss
 - 5M litres (2% of total of production)
- Human resource capacity
 - Damaged homes; access issues, mental health
- Tank capacity
 - 60M litres of tank capacity lost
- Vineyard damage
- Transportation and logistics
 - Port and road closures



Barrel hall, Riverlands, Blenheim



SH1, near Ward

Supply chain response

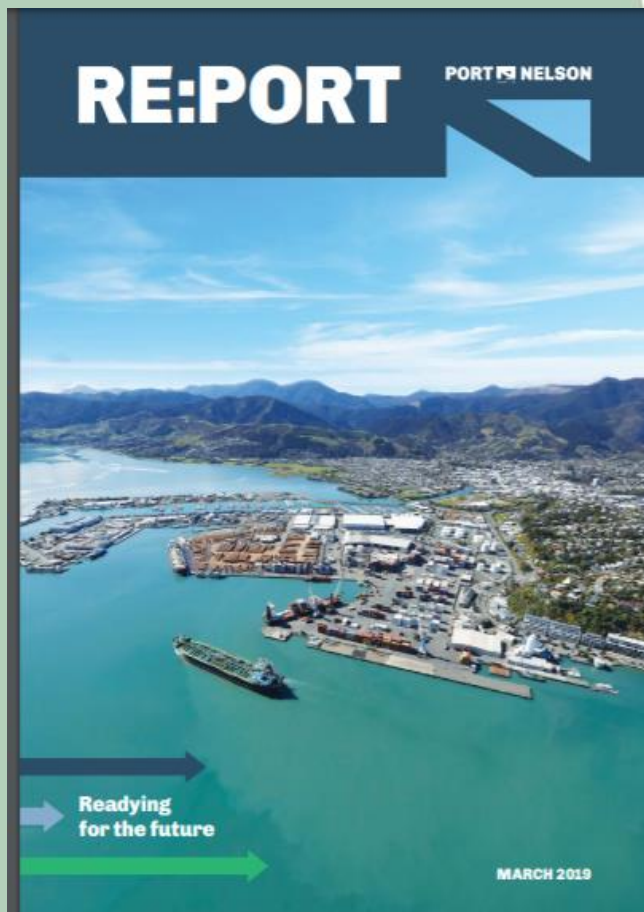


- Tank damage required wine to be shifted out of region
 - *“We took the opportunity after the earthquake to empty as much wine out of the winery as possible and move it into the wider network or bottle off early.”*
- Road and port access limitations caused severe logistical issues
- Existing relationships with Port of Nelson strengthened, and new relationships formed



Moving product, Riverlands, Blenheim

Port of Nelson: enhancing resilience



- Working to develop innovative wine logistics solutions in close consultation with wine industry
- Re-thinking transport logistics
 - Reduced truck journeys by more than half between Nelson & Marlborough
 - cut time trucks on road by 10,000 hours
 - Saved 348,436 litres of fuel; 1,602 tonnes of CO₂ equivalent in first year

Port of Nelson: enhancing resilience



Won 'Resilience to
Climate Change' category
in the national 2017
Green Ribbon Awards



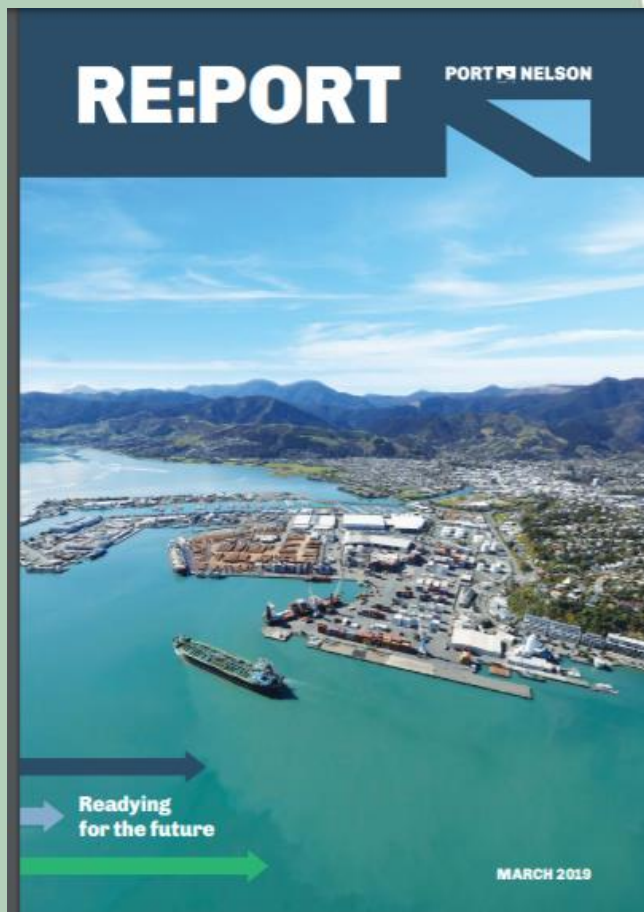
Patterson Logistics Centre

- Commenced early 2016
- approx. 20,000 sq.m.
- Holds 32,000 pallets (mostly wine)
- “Over the last few months we’ve been recruiting logistics and transport staff for the facility to meet demand, which intensified after the 2016 Kaikoura earthquake when we became a key logistics partner for Marlborough wine producers after their traditional transport routes became unusable.
- Supported by rebuilding wharf, new tugs

Port of Nelson: enhancing resilience



Blockchain security



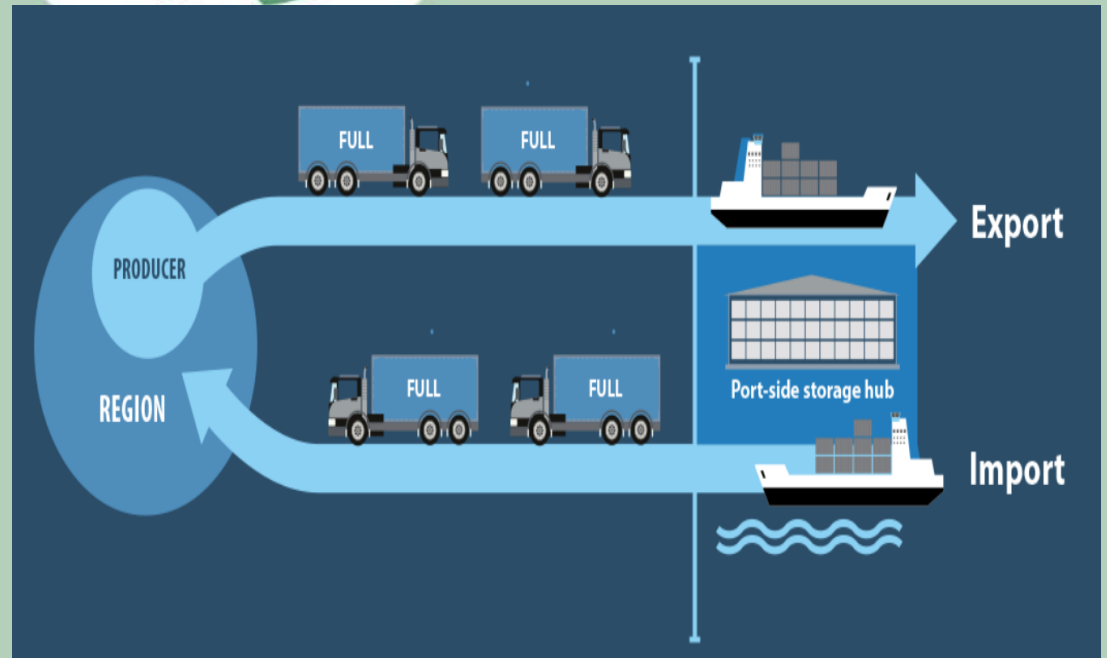
Pelorus - intuitive system giving total visibility as your cargo travels along the supply chain while delivering on-time information direct to users.

- www.pelorus.wine

Port of Nelson: enhancing resilience



Wine waiting for export



Reflections



- Harnessing existing relations and social capital – and extending these networks – can create novel pathways for disaster risk reduction and enhance resilience through value chain relationships
- Transformation is often experienced after a disaster, before a system falls back to re-existing forms and structures
 - Hindered by governance structures
 - Return to ‘old habits’
 - Political resistance to change
- **Foster an environment for continued evolution**

Future research



- Build on existing networks and knowledge
- Share results – within and beyond community
- Explore barriers to transformation community and businesses:
 - Scale of operations; Structures of decision making
 - Value chains between producers → hospitality
- Cradock-Henry, N., Fountain, J. & Buelow, F. (2018) 'Transformations for resilient rural futures: The case of Kaikōura, Aotearoa-New Zealand', *Sustainability*, **10**, 1952. <https://doi.org/10.3390/su10061952>

Resilience in tourism. Lessons learned from Kaikoura

From [Nine To Noon \(/national/programmes/ninetonoon\)](#), 9:43 am on 14 March 2019



Post Kaikoura's 2016 quake how is the tourism sector recovering?

Lincoln University's Joanna Fountain tells Kathryn Ryan that a need to improve food networks in the days and weeks following the quake has had a positive effect on Kaikoura's food story.