NATIONAL
EMERGENCY
RESPONSE
Official Journal of the Australasian Institute of Emergency Services
A.I.E.S.
VOLUME 32 NO. 2 WINTER 2019
PRINT POST PUBLICATION NO. PP100018976

AFL SUPPORTS EMERGENCY SERVICES

STACKS
GOUDKAMP

COMPENSATION AND DISPUTE RESOLUTION SPECIALISTS

Concerned about your entitlements to compensation, disability payment or superannuation?
Our team is professional, experienced and compassionate.

Why not call us today?

Your first consultation is free.

1800 25 1800

stacksgoudkamp.com.au

Sydney, Liverpool, Newcastle

Your compensation partners

Official Publication of
AUSTRALASIAN INSTITUTE OF EMERGENCY SERVICES

Print Post Approved
PP 337586/00067

MAILING AMENDMENTS OR ENQUIRIES
For any amendments or enquiries regarding mailing, please email: secretary@aies.net.au

NOTICE TO ADVERTISERS
This publication is the official journal of the Australasian Institute of Emergency Services. It is published by Countrywide Austral for the Australasian Institute of Emergency Services and will be distributed to its members.
An illegal practice is presently operating where advertisements from some of our publications are used to produce unauthorised publications and our advertisers are contacted for payment for the unauthorised advertisement.
If you are approached to place an advertisement or with a request for payment for another publication, you should verify that the advertisement has been authorised and establish the bona fides of the company.
The invoice and any correspondence should have the company name, ABN, and an address (not just a PO Box) and you should ask for proof of publication.
If you do receive a request for an unauthorised advertisement, or have concerns about the bona fides of a company, we suggest you refer it to the Office of Fair Trading in your capital city.

PUBLISHER
National Emergency Response is published by
Countrywide Austral

countrywideaustral

Level 2, 310 King Street, Melbourne
GPO Box 2466, Melbourne 3001
Ph: (03) 9937 0200
Fax: (03) 9937 0201
Email: admin@cwaustral.com.au
ACN: 30 086 202 093

EDITORIAL TEAM
Editor: Kristi High
Associate Editor: Ron Jones LFAIES

Send articles for inclusion to:
Email: editor@aies.net.au

WEBSITE
www.aies.net.au

WEBSITE CONTENT
The website has sections for each State as well as National Areas. If you have ideas for State Division content, please contact your State Secretary, for National content, email web@aies.net.au
Please be aware that all content must go past the National Secretary prior to web publication to ensure it meets required guidelines.

NATIONAL EMERGENCY RESPONSE
Official Journal of the Australasian Institute of Emergency Services

Winter 2019 • National Emergency Response

CONTENTS

REGULAR COLUMNS

FEATURES

FRONT COVER
The inaugural Emergency Services Match was played at the MCG on 5 July between Hawthorn and Collingwood football clubs.
Photo supplied by Hawthorn FC

NEW MEMBERS

The Australasian Institute of Emergency Services is pleased to announce the following emergency services people joined the AIES between January and April 2019.

NAME	ORGANISATION	DIVISION
Jarrod Bell	State Emergency Service	VIC
Andrew Bennett	State Emergency Service	NSW
Luke Freeman	State Emergency Service	NSW
James Henderson	Fire & Rescue	NSW
Peter Jenkins	Police	NSW
Stephen Keating	Country Fire Authority	VIC
Reece Milburn	BCC Disaster Management	QLD
Skye Moxham	St John Ambulance	WA
Opstar Pty Ltd	Corporate membership	NSW
Simon Osborne	Volunteer Rural Fire	New Zealand
Dean Webb	Rural Fire Service	NSW

www.facebook.com/aies.online

https://au.linkedin.com/company/australian-institute-of-emergency-services or log in at au.linkedin.com and search for 'Australian Institute of Emergency Services' under 'Companies'.

Articles, photographs and short stories are sought for the *National Emergency Response Journal*. Please submit items for the next edition to editor@aies.net.au by 2 September 2019. There is an annual award for the best article submitted by an AIES member.

FROM THE PRESIDENT'S DESK

Steve **Jenkins,** FAIES

National President

On Friday 5 July 2019, I had the pleasure of attending the formal retirement function for Queensland's 19th Commissioner of Police, Ian Stewart APM.

I have known Commissioner Stewart in various capacities during my own policing career in the Queensland Police Service (QPS) over the past 30 years. Commissioner Stewart was also the inaugural Patron of the Queensland Division of the Australasian Institute of Emergency Services (AIES). The function was held on the Speaker's Green at Parliament House; a very fitting location to farewell a fine police officer and commissioner. I wish Mr Stewart and his wife Carol all the best in retirement.

While at Commissioner Stewart's function, I also had the pleasure of meeting former QPS Commissioner Bob Atkinson APM and then Commissioner Designate Katarina Carroll APM, both of whom I had also previously worked with in varying capacities. Prior to being appointed as the Queensland Fire and Emergency Services Commissioner in December 2014, Commissioner Carroll was an Assistant Commissioner with the QPS, notably in the Far Northern Region when Tropical Cyclone Yasi impacted the North Queensland coast in the Tully, Mission Beach and Cardwell areas in January 2011, and commander of the G20 Group and Operation Southern Cross that provided security for the G20 leaders' forum and associated events in 2014. Commissioner Carroll has some outstanding achievements to her credit from her time at QFES and I am confident that she will continue to make significant achievements at the QPS.

I would like to welcome Victorian Division Management Committee Vice-President Doug Caulfield to the Board. Doug was recently appointed to the Board as an Independent Director. Also, Jim Pullin (NSW) has now formally taken over as Company Secretary. Welcome, Jim. Luke Freeman has also been appointed to the NSW Division Management Committee in place of Brett Henderson who has stepped aside for personal reasons. I thank Brett for his input whist a member of the NSW Committee and wish him well. I hope to see him return to the committee in due course.

My congratulations to Jennifer (Jenny) Crump (Qld) and William (Bill) Hoyles (NSW) and on being elevated in status to Fellow of the Institute. Jenny is the Institute's National Treasurer and a member of the Queensland Division Management Committee. Bill travels frequently, and writes articles about the places he visits for the *National Emergency Response* journal. Both are very worthy of being admitted as Fellows of the Institute.

> *"My congratulations to Jennifer (Jenny) Crump (Qld) and William (Bill) Hoyles (NSW) and on being elevated in status to Fellow of the Institute."*

Each year the Institute is a partner for the Australian and New Zealand Disaster and Emergency Management Conference. As part of the Partnering Agreement, the Institute receives a number of complimentary registrations to attend the conference. This year the conference was held at the RACV Royal Pines on the Gold Coast. The complimentary registrations were awarded to three members: Murray Middleton (Country Fire Authority and Ambulance Victoria), Luke Freeman (NSW State Emergency Service), and Sven Nilsson (St John Ambulance NSW and Sydney Local Health District). The Institute also has a booth in the exhibition hall during the conference. The booth was staffed this year by Jenny Crump (Qld) with assistance periodically from other AIES attendees. My thanks to everyone for their contributions.

A reminder also that the AIES is entitled to nominate members to attend Volunteer Leadership Programs (VLPs) conducted on behalf of the Australian Emergency Management Volunteer Forum at various locations around the nation. Details of VLP dates, (including application closing dates), locations and nomination forms are available at: www.aidr.org.au/programs/volunteer-leadership-program/

For the remainder of 2019, VLPs will be conducted at Launceston (September), Adelaide (October) and Tamworth (November). The Board has also agreed to consider requests for travel assistance from members who are desirous of attending a VLP and who may have to travel a considerable distance. These requests will be considered on a case-by-case basis. Please remember that applications need to be endorsed by the nominating agency prior to being submitted.

Articles are always sought for the *National Emergency Response* journal. These can range from a photo with an accompanying paragraph to articles that span many pages. Submissions should be sent to editor@aies.net.au

Members submitting articles automatically become eligible for the Institute's annual Golden Pen Award. The Board decides the winner of this award during the annual face-to-face meeting and the winner announced at the Annual General Meeting.

TIME to INVEST

aps savings

aps benefitsGROUP
Protecting your financial wellbeing

LOYALTY REWARDS PROGRAM
LRP
APS Benefits Group

4.00% p.a.*
Fixed Term Investment

12 or 24 MONTH TERM INVESTMENT — **4.00% p.a.***

6 MONTH TERM INVESTMENT — **3.75% p.a.***

30 Day Notice of Withdrawal Investment Account — **3.50% p.a.***

APS Savings Ltd is offering these attractive interest rates on fixed term investments

Give APS Savings a call on 1300 131 809 or go to our website www.apssavings.com.au to access the prospectus and application form.

Interest is calculated daily, paid monthly and can either be added to the principal or credited to a nominated account.

*APS Savings Disclaimer. This is not a bank product, it is an unlisted deposit note. No independent assessment has been made about the risk to investors losing any of their principal investment. Applications for deposit notes can only be made on the Investment Application Form which accompanies the prospectus issued by APS Savings Ltd. Please read the prospectus carefully before deciding whether to make an investment.

TIME TO INVEST

aps savings

4.00% p.a.* Fixed Term Investment

aps benefitsGROUP
Protecting your financial wellbeing

APS Savings Ltd is offering these attractive interest rates on fixed term investments

4.00% p.a.*	3.75% p.a.*	3.50% p.a.*
12 or 24 Month Term Investment	6 Month Term Investment	31 Day Notice of Withdrawal Investment Account

Give **APS Savings** a call on **1300 131 809** or go to our website **www.apssavings.com.au** to access the **prospectus** and **application form**.

Interest is calculated daily, paid monthly and can either be added to the principal or credited to a nominated account.

PROFIT for members

*APS Savings Disclaimer. This is not a bank product, it is an unlisted deposit note. No independent assessment has been made about the risk to investors losing any of their principal investment. Applications for deposit notes can only be made on the Investment Application Form which accompanies the prospectus issued by APS Savings Ltd. Please read the prospectus carefully before deciding whether to make an investment.

VAN TASTIC – COMMUNITY-LED RECOVERY INITIATIVE

Paper presented at the Australian & New Zealand Disaster & Emergency Management Conference Gold Coast, Queensland, Australia, 12-13 June 2019

Sue **Rondeau**

Moyne Shire Council, Recovery Manager

Mat **Deans**

Moyne Shire Council, Recovery Case Manager

INTRODUCTION

Following a disaster, recovery managers are faced with the need to develop a recovery strategy that best meets the needs of an affected community. A common management structure used in Australia to coordinate and manage recovery is the establishment of a community recovery committee. These committees are formal and structured and membership usually consists of Council, agencies and a small number of community members who represent the broader affected community.

However, what we have learnt is that emergencies happen to actual people and people should be given a choice in how they engage in their recovery. Recovery shouldn't be prescribed by government or agencies. One common management structure may work in some communities but not others. Therefore, a choice of engagement strategies should be on offer and recovery managers should be flexible and adaptive to each community's needs and provide a strategy that fits.

The strategy that the South West Fires Recovery Team designed was based on the community's request that it be informal, flexible, adaptable and accessible.

With an understanding that communities with strong social networks[1] help each other to recover, the Recovery Team's goal was to not only engage with the community but to build social capital.

Map 1: South-west fires

To build social capital and to effectively engage with the affected community the Recovery Team developed a mobile outreach model in the form of a recovery van. The van was mobile and came to the affected community. "Van Tastic" or commonly called "the van", provided the heart of the recovery strategy and established a community hub from nothing. The van operated on the side of the road, in four separate locations across two local government areas and two fire sites, and was on the road for over 40 weeks. The van had over 700 visits from the community and has formed a connected community – one where people care, support and encourage each other.

THE CONTEXT

At approximately 9pm on 17 March 2018 a fierce wind storm hit the south-west of Victoria. In excess of 23 grass and scrub fires were ignited. Many of the fires were extinguished that night, however four continued to burn uncontrolled until the early hours of Sunday morning. The four fires destroyed 29 houses and killed thousands of livestock across three local government areas. Two of the fires impacted communities in the Moyne Shire; the Garvoc fire and the Gazette fire. Sadly, Garvoc was also impacted in 1983 during the Ash Wednesday fires – with many of the community impacted for a second time in 2018.

There were no townships directly impacted or public infrastructure lost, with the majority of the fires destroying private residences and farms.

THE COMMUNITY

Understanding the community context following any emergency is incredibly important as it helps to inform the recovery strategy. The task was complex as there were over 100kms of travel between both fires and they crossed three LGAs. All three councils came together and an agreement was made that Moyne Shire would manage the entire Gazette fire and work alongside Corangamite Shire with the community impacted by the Garvoc fire.

1 Aldrich D. 2012 Building Resilience Social Capital in Post Disaster Recovery University of Chicago Press

All communities are more complex than what people may think from the outside; they consist of people with different backgrounds, beliefs/religions and experiences. The demographics can also be challenging and in this case, the majority of the farmers affected were male and over 40 years of age. There was also long-held historical differences between some farming families and a clear difference of opinion was evident between people who lived in nearby towns (not directly impacted by the fires) versus the farming families who were directly impacted.

THE ESTABLISHED APPROACH VERSUS COMMUNITY-LED

Common management structures used in recovery include the establishment of recovery committees. According to the Australian Disaster Resilience Handbook on Community Recovery *"A recovery committee is the strategic decision-making body for recovery."*[2] Memberships of these committees usually consist of Council, agencies and a small number of community members, who represent the broader community. Committees are formal and bound by rules and process. Minutes are captured and distributed. The intended goal of these formal meetings is to provide *"visible and strong leadership and provide a mechanisim for local leadership and community self determination"*[3].

Six weeks post-impact, a series of meetings called "Following the Fires" were held across both fire sites. The timing and location of these sessions were crucial and well considered to fit farmers' routines.

The objective of these sessions was to provide a relaxed and informal space in which the Recovery Team could discuss recovery options that best met their needs as the affected community. The establishment of a recovery committee was proposed and discussed. All the attendees at the meetings absolutely refused the option of establishing a recovery committee.

Independently and across all of the meetings, the community unanimously demanded a model that was informal, flexible, accessible, adaptable and met their needs locally. To be truly led by the community requires the building of relationships and trust. Many have identified the importance of community-led recovery; Archer and colleagues (2015)[4] and Winkworth (2007)[5], along with numerous government handbooks. However, all too often in practice community-led recovery is not supported.

THE CHALLENGES

After extensive research it was determined that a model such as the one the community demanded didn't exist.

Challenges to overcome were:

- Farmers are traditionally isolated and work alone and can be difficult to engage with
- Due to the nature of their work, initially farmers have a need to be on their properties to attend to dead or injured livestock, build new fences and most importantly to rebuild their farming business
- Garvoc community was previously impacted by the Ash Wednesday Fires in 1983
- Suicide statistics of the Great South Coast doubled between 2009-2014 with 84 per cent of GSC suicides middle-aged men between 35 and 63 years[6].

Funding was also a challenge. As the fires did not destroy any public infrastructure the criteria were not met to activate the Natural Disaster Relief and Recovery Arrangements.

THE STRATEGY

In developing an effective strategy it was important to meet the needs of the community so the Recovery Team conducted some research. What we discovered is that:

- social strategies that encourage active participation in the community reduce stress[7]
- survivors with strong social networks experience faster recoveries[8]
- psychosocial support is best delivered as a community-based activity rather than within a medical health system[9]

With this understanding the Recovery Team met the community's challenge and devised a strategy that focussed on engaging with the community; not door-to-door but providing a neutral space for the community to come together. A van provided the perfect vehicle for the engagement to succeed. The van provided the heart of the strategy and established a community hub from nothing. It is an outreach model that brings services, information and support directly to the affected communities literally on the side of the road.

Surrounding the van are supporting strategies; they include home visits, telephone calls, texting and importantly a referral connection both ways to other agencies such as:

- South West Healthcare
- Department of Land, Water, Environment and Planning
- Forest Fire Management
- Agriculture Victoria
- Rural Financial Counselling Services
- Blazeaid

To best meet the community's need and to align with geographical distances it was decided that the van would visit four separate locations across two fire sites each week.

Initially the van provided the community with essential information and connected them with services and agencies. It was a neutral place where the community felt safe, where they could raise issues and concerns over a cup of coffee and a barbecue lunch. Their issues and concerns were solved quite literally on the side of the road. Because of the

continued on page 8

2 Australian Disaster Resilience Handbook Collection – Community Recovery, Australian Institute for Disaster Resilience; pg42
3 Australian Disaster Resilience Handbook Collection – Community Recovery, Australian Institute for Disaster Resilience; pg42
4 Archer F, McArdle D, Spencer C & Robert F 2015, Literature review: What does good or successful recovery look like?, Monash University Injury Research Unit, Melbourne.
5 Winkworth G 2007, Disaster recovery: A review of the literature, Australian Catholic University, Dickson, ACT.
6 Victorian Suicide Register (2009-2014)
7 Van Ommeren M, Sazena S, & Saraceno B, 2005, Mental and social health during and after acute emergencies: emerging consensus? Bulletin of the World Health Organisation 83 (1)
8 Aldrich D. 2012 Building Resilience Social Capital in Post Disaster Recovery University of Chicago Press
9 Inter-Agency Standing Committee 2007; International Federation of Red Cross and Red Crescent Societies, van Ommeran, Saxena & Saraceno 2005

continued from page 7

informality of the conversations between agencies and community it enabled relationships to establish and develop. These relationships enhanced community recovery and would not have occurred if not for the van and its welcoming and collaborative approach.

However, the van quickly transitioned from just providing essential information to being a place that provided a constant in people's lives. The van:

- Allowed peers to check in with each other in a non-intrusive manner
- Encouraged non-judgemental conversations
- Provided a safe place to share experiences
- Provided respite
- Connected people
- Was informal and non-threatening
- Engaged with a demographic that is notoriously difficult to engage with
- Improved the mental health of the impacted community
- Created a trusted environment where people felt comfortable to seek further mental health support
- Connected people with further support services
- Provided a means for Recovery Managers to monitor/evaluate the health and wellbeing of attendees and organise interventions when required
- Built resilience within an affected community
- Facilitated the opportunities for micro projects to occur

The strategy designed by the Recovery Team is a new option for Victorians after a disaster. It is a non-clinical, safe, supported community-based model. The concept of a non-clinical community-based model is further supported by the Australian Psychological Society's Psychological First Aid Booklet where it states *"It has been recognised both in Australia and internationally that psychosocial support in emergencies is best delivered as a community-based activity, rather than within a medical health system."*[10]

Victoria's Suicide Prevention Framework further supports place-based or community-based models by saying, *"Place-based approaches to suicide prevention are effective in reducing suicides."*[11]

The affected community have evaluated the model and have said, "It is a must and should be used in any community following any disaster". Evidence of this is provided in a video that was developed to capture why memb the of the community initially visited and van and why they continued to visit each week.

Van Tastic in operation on the Sisters-Garvoc Rd.

THE STATISTICS

Over 700 visits were made to the van with an average of 20.4 each week. The statistics below provide further details:

Communication and building of trust has proven outcomes for the community. The following communication statistics outline our commitment to conversation.

In addition to the stresses that a disaster has on a community, the Recovery Team were very cognisant about mental health of rural farming families.

[10] Australian Psychological Society Psychological First Aid An Australian guide to supporting people affected by disaster
[11] Victorian Suicide Prevention Framework 2016-2025. Department of Health and Human Services

VAN STATISTICS		TOTAL
Individuals who visited the van	71 (Garvoc) 33 (Gazette)	104 people
Gender	Males 20 (Gazette) Females 13 (Gazette) Males 43 (Garvoc) Females 28 (Garvoc)	Males 63 Females 41

	WEEKLY	TOTAL (40 WEEKS)
Sausages cooked at the van	48	1,920 sausages
Kilometres driven by the van	213.4 kms	8,536 kms
Fuel to fill up the van	40 litres	1,600 litres
Tim Tams eaten at the van	48 Tim Tams	1,920 Tim Tams
Hot drinks served at the van	36 hot drinks	1,440 hot drinks
Connections	416 connections	14,976

COMMUNICATION	WEEKLY	TOTALS (40 WEEKS)
Weekly SMS/Texting	160 messages sent weekly	6,400 texts 320 hours (mostly after hours)
Newsletter distribution	280 per month	2,800
Telephone conversations	12 calls weekly (on average)	480 calls 80 hours of conversations
Home visits	4 per week	160 visits
Non-judgemental conversations at the van	10 hours	400 hours

AGE OF MALES WHO VISITED THE VAN		TOTAL
Males (35-63yoa)	16 (Gazette) 23 (Garvoc)	39
Males (+63yoa)	3 (Gazette) 13 (Garvoc)	16
Males (<35 yoa)	7 (Garvoc) 1 (Gazette)	8

Recent research by the University of Melbourne using data from the Victorian Suicide Register (2009-2014) revealed that:

- Deaths from suicide in the Great South Coast region doubled between 2009-2014
- 84 per cent of GSC suicides were middle-aged men aged between 35 and 63 years
- 25 per cent of men who died by suicide were perpetrators of partner violence.

The van was extremely successful in engaging with men between the ages of 35 to 63 years which is a critical age group at a higher risk of suicide.

But more importantly it allowed all the community to come together. Another outcome was that the community organised their own functions such as the:

- Inaugural Fire Dam Regatta where 41 community members attended for a fun day of kayaking and laughter.
- Christmas dinner was held on the side of the road where Santa and 68 community members attended.
- Tree planting day where 70 trees were planted by 32 community members
- Pizza nights where 52 people were in attendance
- Ladies lunches where 47 people attend over four lunches

BUILDING RESILIENCE

On 6 February 2019, a grass and scrub fire was ignited by lightning in the same location as the Garvoc fire in March 2018. The community responded as one. The initial fire suppression was led by three separate community members coming together and by working as a team they stopped the fire spread prior to the arrival of Country Fire Authority. Other community members were phoning and checking on their neighbours' welfare and offering support to each other.

This is evidence of a community working together in the face of another potentially catastrophic disaster.

The community as a whole are also taking an interest in learning more about fire behaviour and understanding their risks. Some participants have joined their local Country Fire Authority Fire Brigade and other community members are interested to learn how they can support volunteer organisations in the event of another disaster.

THE LEARNINGS

When developing a recovery strategy Recovery Managers should:

- Understand the community context
- Listen to your community and be led by them and at their pace
- Build trust and relationships
- Be consistent
- Understand that although statistics are important, don't be consumed by them: they should come second to people's needs
- Appreciate that emergencies happen to actual people
- Know that people affected by a disaster come with a history
- Not process people
- Be brave and back yourself
- Know that death of livestock causes immense trauma for farmers. In some cases it is as traumatic as losing family members
- Know that what is said and done to the fire-affected individuals in the response phase affects their recovery

CONCLUSION

In the van's infancy, some members of the community thought that it was a lot of "hocus- pocus". They were sceptical about the outcomes that

continued on page 10

continued from page 9

could be achieved from such a unique strategy. However, they were amazed at its success and its ability to support them and build resilience. Although in its uniqueness it does align with The National Strategy for Disaster Resilience which was adopted by the Council of Australian Governments (COAG) in February 2011, which states that *"We need to focus on a shared responsibility"*.[12]

The National Strategy for Disaster Resilience further states that *"Resilient communities also share the importance of social systems, such as neighbourhoods, family and kinship networks, social cohesion, mutual interest groups, and mutual self-help groups."*[13] The van used those principles which allowed the model to be such an enormous success in the community.

Not only does the van align with the National Strategy for Disaster Resilience, it is also consistent with Victoria's Community Resilience Framework[14].

The success of the van is in its ability to engage with a broad stakeholder group which includes Council, community and agencies. It was flexible in design and adapted to the changing needs of a recovering community. It allowed people to recover at their own pace and enabled problems to be solved sometimes, immediately and face-to-face. It achieved our overarching goal of a community-led recovery.

Sue Rondeau
Moyne Shire Council
Recovery Manager
E: srondeau@moyne.vic.gov.au
P: +61 411 869146

Mat Deans
Moyne Shire Council
Recovery Case Manager
E: mdeans@moyne.vic.gov.au
P: +61 428 000 355

REFERENCES

Aldrich D. 2012 Building Resilience Social Capital in Post Disaster Recovery University of Chicago Press

Archer F, McArdle D, Spencer C & Robert F 2015, Literature review: What does good or successful recovery look like?, Monash University Injury Research Unit, Melbourne.

Australian Disaster Resilience Handbook Collection – Community Recovery, Australian Institute for Disaster Resilience; pg 42

Australian Psychological Society Psychological First Aid An Australian guide to supporting people affected by disaster

Inter-Agency Standing Committee 2007; International Federation of Red Cross and Red Crescent Societies, van Ommeran, Saxena & Saraceno 2005

National Strategy for Disaster Resilience Council of Australian Governments (COAG) in February 2011

Van Ommeren M, Sazena S, & Saraceno B 2005 Mental and social health during and after acute emergencies: emerging consensus? Bulletin of the World Health Organisation, 83 (1)

Victoria's Community Resilience Framework for Emergency Management Victorian Suicide Register (2009-2014)

Winkworth G 2007, Disaster recovery: A review of the literature, Australian Catholic University, Dickson, ACT.

[12] National Strategy for Disaster Resilience Council of Australian Governments (COAG) in February 2011
[13] National Strategy for Disaster Resilience Council of Australian Governments (COAG) in February 2011
[14] Victoria's Community Resilience Framework

afac19

powered by INTERSCHUTZ

A shift to the new norm: riding the wave of change

MELBOURNE CONVENTION AND EXHIBITION CENTRE

27 – 30 AUGUST 2019

Running concurrently with the:
Australian Disaster Resilience Conference
Institution of Fire Engineers Australia National Conference

afacconference.com.au #afac19

afac

bushfire&natural HAZARDSCRC

Deutsche Messe

Knowledge Centre Sponsor
Australian Institute for Disaster Resilience

Gala Dinner Sponsor
Firefighters Mutual Bank
Serving those who protect

Welcome Function Sponsor
ISUZU TRUCKS

Conference Delegate Satchel Sponsor
babcock

Lanyard Sponsor
GAAM Emergency Products

Cafe Naming Sponsor
Power equipment Est. 1990

German Pavilion
made in Germany
German Pavilion
Meet German companies at trade fairs worldwide

WE *ARE* BETTER TOGETHER...

Rain **Histen**

Ambulance Victoria Paramedic

It's the morning of the MCG Stadium Stomp; 30 June in Melbourne. The sun is out and I am feeling a bit uneasy – 7,600 steps in total – OUCH!

This event is a special one combining all the emergency services together for a united cause to raise funds for the Emergency Services Foundation Charity (ESFC). ESFC is dedicated to providing supportive strategies surrounding first responder mental health and wellbeing.

Paramedics often stick together; we know our breed and are quite comfortable with our peers, even in silence. Emotional intelligence is always improving but we can be guilty of "down play" when it comes to our personal stuff – I mean everybody else is worse off right?

Oh and we know we are terrible patients!

It's not all bad though because our culture has improved and we are encouraged to "talk about our stuff." That's when we raise our hands and announce that it is check in time – with a professional or a mate over *good* coffee.

This cycle is continuous due to our dynamic work stress and life's ups and downs. We signed up for it! Sure! Because of our innate Morse code telling us to "help others" – you either have it or you don't. We do.

Maybe the other services do mental health different? Or better? How will we ever know unless we ask, interact, *connect*? There really isn't time for a catch up at the multi-car accident is there? Not even time to ask, "Are you ok after that?" Like robots we ask for the police service number for our paperwork, but that's as close as we get to a form of connection.

We can learn a lot from our emergency services extended family, and *give* a lot too. After all, there is plenty of time to talk on all those stairs!

See you at the next one.

Tony Walker (AV CEO), Siusan MacKenzie (ESF CEO) and Andrew Crisp (Emergency Management Commissioner for Victoria)

Kylie Evans (MFB) Rain Histen (AV)

Lifesaving Victoria: Michelle Murphy, Brendan Smart, Rain Histen (AV) and Annie Coleman

EFFECTS OF CLIMATE CHANGE ON NEW ZEALAND DESIGN WIND SPEEDS

Paper presented at the Australian & New Zealand Disaster & Emergency Management Conference Gold Coast Queensland, Australia, 12 - 13 June 2019

Amir A. **Safaei Pirooz**

Department of Mechanical Engineering, The University of Auckland

Richard G.J. **Flay**

Department of Mechanical Engineering, The University of Auckland

Richard **Turner**

National Institute of Water and Atmospheric Research, New Zealand

Cesar **Azorin-Molina**

Regional Climate Group, Department of Earth Sciences, University of Gothenburg
Centro de Investigaciones sobre Desertificación – Spanish National Research Council (CIDE-CSIC)

INTRODUCTION

The long-term trends in near surface wind speeds (Roderick *et al*., 2007; McVicar *et al*., 2012), extreme weather events and gust wind speeds (Azorin-Molina *et al*., 2016) have been changing over the last few decades. Growing interest and concern about the effects of climate change on cities, infrastructures and people's lives raises the question: "how are design wind speeds influenced by different climate change scenarios?". Extreme winds have serious societal and environmental impacts on countries. New Zealand's vulnerability to extreme weather is well known, due to its position in the 'Roaring Forties', with many population centres and infrastructure assets located in exposed coastal or hilly areas (NIWA, 2019).

Structures are designed to resist the strongest winds likely to happen during the lifetime of a structure. Extreme winds can cause significant damage and costs to a country. In Europe, during the period from 1980 to 2009, extreme winds and storms were the most expensive natural hazard sharing about 32 per cent and 59 per cent of overall and insured losses, respectively (Wehrli *et al*., 2010; Suomi and Vihma, 2018). In the USA since 1980, there have been about 155 extreme wind-related disasters in which overall costs reached or exceeded $1 billion USD. The total cost of these 155 events exceeds $1.13 trillion (2018 USD) with over 6,000 deaths (NOAA National Centres for Environmental Information (NCEI), 2018). In New Zealand, the period from January 2013 to June 2018 has been notable for the high number of wind-related losses ($828 million 2017 NZD) (Figure 1). Therefore, accurate estimations of design wind speeds and investigating all the contributing factors in the prediction of wind loads ensure the safety and reliability of future buildings and infrastructures.

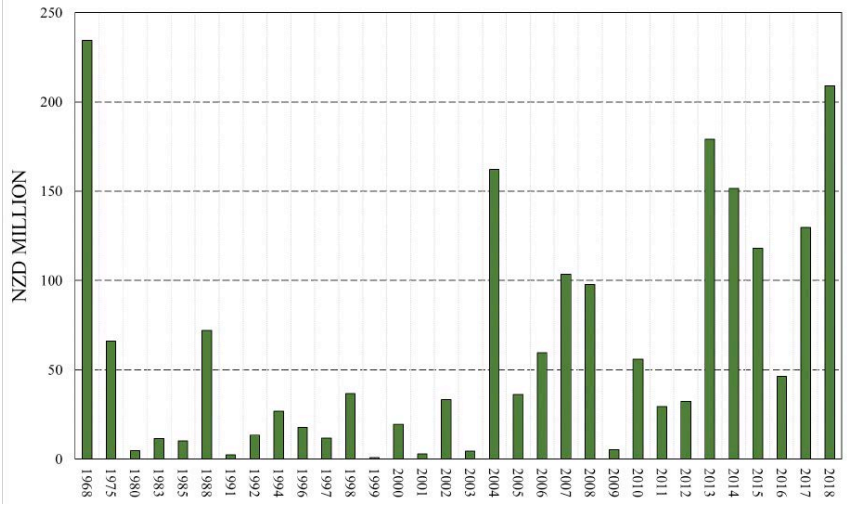


Figure 1: Time series from 1968 to August 2018 of insured losses in New Zealand (inflation adjusted to 2017 NZD) related to storm events where wind damage was a major factor (i.e., not counting storm events where losses were primarily due to flood or coastal erosion) contributing to losses (Insurance Council of New Zealand, https://www.icnz.org.nz; last accessed 6 June 2019).

In the calculation of design wind loads, the estimation of appropriate design wind speeds is a crucial first step, which are provided in wind-loading standards. AS/NZS1170.2 (2011), the reference wind-loading standard in Australia and New Zealand, defines the design wind speed ($V_{sit,\beta}$) as $V_{sit,\beta} = V_R M_d M_{z,cat} M_s M_t$, where V_R is regional gust wind speed, $M_d M_{z,cat} M_s$ and M_t are directional, terrain/height, shielding and topography multipliers, respectively. However, for the next version of AS/NZS1170.2, the Australian/New Zealand standard committee is considering adding a new multiplier called "climate change multiplier (M_c)", which allows for possible changes in long-term extreme wind speeds due to different scenarios of climate change. Currently, the value of M_c for New Zealand's wind regions is 1.0. Therefore, it is important to evaluate the long-term wind gust trends and determine whether or not the changes in wind trends are significant, and if yes, how these changes can be codified for the estimation of design wind speeds.

A number of recent studies regarding wind speed variability have been concerned with mean near-surface wind speed trends, particularly after observing a reducing trend in mean wind speeds in many locations around the world, which was termed "stilling" by Roderick *et al.* (2007). McVicar *et al.* (2012) wrote a comprehensive review on studies investigating the mean wind speed trends around the globe. However, the evaluation of long-term daily and annual-seasonal gust wind speeds has received less attention with only a few studies analysing gust wind speed trends, which have been briefly reviewed by Azorin-Molina *et al.* (2016). Studying daily gust wind speeds is essential for the assessment of wind-related hazard risks to countries (Azorin-Molina *et al.*, 2019).

Most of the studies of long-term wind gust variability have shown a declining trend that agrees with the stilling phenomenon. Azorin-Molina *et al.* (2016) analysed the trends in the frequency of daily gusts exceeding the 90th percentile of the entire days and the magnitude of average of daily peak wind gusts in Spain and Portugal for 1961-2014. Their results demonstrated that in general, more frequent and increasing daily gusts happened in the warm season (May-October), and less frequent daily gusts with a reducing trend were observed in the cold semester (November-April). Azorin-Molina *et al.* (2019) proposed an algorithm to homogenise daily peak wind gusts, which showed promising results in eliminating artificial breakpoints in Australia's daily gust wind speeds.

Having analysed 101 years of wind speed data recorded at five stations in the Netherlands, Cusack (2013) demonstrated that there was a declining trend in windstorm losses in the past two decades due to decrease in frequency of damaging storms. Another independent study analysing the extreme winds over the Netherlands (Smits *et al.*, 2005) also reported a decline in storminess. There have been other studies reporting decline in maximum wind speeds; for example works done by Németh *et al.* (2011) (Hungary), Hewston and Dorling (2011) (UK), Pryor *et al.* (2009) (USA), and Jiang *et al.* (2010) (China). On the other hand, some studies have reported increasing or constant extreme wind speed trends. Usbeck *et al.* (2010) reported significant increase in trends of both frequency and magnitude of storm damage in Switzerland by investigating 150 years of extreme-wind and storm-damage data. Kruger *et al.* (2010) identified the main mechanisms generating extreme winds in South Africa, and by analysing annual extreme wind gusts recorded at 94 meteorological stations, well distributed across the country, showed that the average annual maximum wind gusts has increased during 1993 to 2008.

When analysing extreme wind events, the magnitude of wind speed is not the only important parameter. It is essential to know how often these extreme events take place. The frequency of occurrence of extreme winds are of interest to various industries, such as wind loads on structures. To date no study has been conducted to homogenise New Zealand's wind speed time series in details. Also, there are only few unpublished reports on the short-term wind speed trends at some regions of New Zealand based on the data recorded prior to the 1990s (before the implementation of Automatic Weather Stations (AWS)). Recently, Turner *et al.* (2019) proposed a homogenisation and quality control algorithm to eliminate all the artificial (i.e. non-climatic) breakpoints and trends in wind speed time series. In addition, by way of example, they briefly reported trends in the magnitudes of average of maximum daily gusts and frequencies of occurrence of extreme winds at one location in New Zealand, namely Wellington Aero station.

In this paper, initially the observed daily gust wind speeds at the four stations were quality controlled and homogenised. Then, trends in the magnitudes and frequencies of annual and seasonal maximum gust speeds were assessed. Lastly, the findings of this study were briefly compared with IPCC 5th assessment projections for New Zealand reported by Ministry for the Environment (2018).

DATA AND HOMOGENISATION PROCESS

STATIONS AND DATA

Four stations, namely Wellington, Auckland, Christchurch and Invercargill (see Figure 2) were selected based on the available length of wind data series, quality of data, and minimal disruptions in time series due to changes in instrumentations and mast relocation. In addition, all these stations are well-exposed sites, i.e. airports, which ensure less immediate surrounding environmental changes. Lastly, Azorin-Molina *et al.* (2014) pointed out that few stations are enough for capturing the long-term wind speed variability and trends.

Daily and hourly maximum gust speeds, 10-minute mean speeds and directions were extracted from NIWA's[1] climate database (NIWA, 2018) for 1972-2017. Table 1 describes information and metadata of the stations used here. In New Zealand, before the 1990s, mainly heavy-cup Mark II Munro (hereafter MK II) anemometers with chart recorders were used and then replaced

continued on page 16

[1] The National Institute of Water and Atmospheric Research (NIWA), is a Crown Research Institute of New Zealand. Established in 1992, NIWA conducts commercial and non-commercial research across a broad range of disciplines in the environmental sciences. https://www.niwa.co.nz/ (last accessed 6 June 2019).

continued from page 15

with light cup anemometers (Vaisala WAA151 and Vector A101 anemometers) with digital recorders. Before the digital recording systems, the effective gust duration was only a function of the anemometer response, which for MKII was about 1 s (Safaei Pirooz and Flay, 2018b). However, since the 1990s, the WMO-recommended 3-s moving average definition has been accepted and adopted by meteorological stations.

HOMOGENISATION ALGORITHM

Wind speed data series can be influenced by several factors, which may cause inhomogeneities contaminating any subsequent analyses. Historical hourly and daily gust wind speed series recorded at the four selected stations were subjected to a robust quality control and homogenisation protocol (Turner *et al.*, 2019) to ensure all the artificial inhomogeneities resulting from factors like station relocations, anemometer height changes, instrumentation malfunctions, instrumentation changes, different sampling intervals, and observation environment changes, have been eliminated prior to any subsequent analyses. Several researchers (Masters *et al.*, 2010; Powell *et al.*, 1996; Safaei Pirooz *et al.*, 2018; Turner *et al.*, 2019) have demonstrated that using wind data observations without quality control and homogenisation can introduce significant errors, about 10-40 per cent in future analyses.

Figure 2: Selected stations across New Zealand

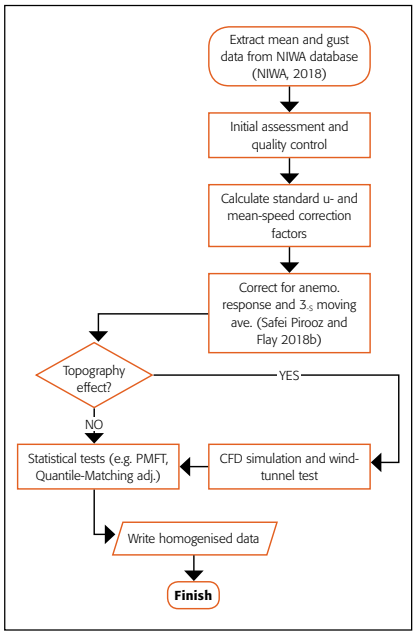


Figure 3: A summary of the homogenisation process (Turner et al., 2019)

In the current study, the homogenisation algorithm recently proposed by Turner *et al.* (2019) (see Figure 3) has been used to detect and eliminate all the artificial breakpoints and trends in time series, to ensure the accuracy and reliability of the trend analyses. The algorithm utilises various tools, such as wind-tunnel tests, computational fluid dynamics (CFD) simulations, statistical tests (i.e. Penalised Maximal F Test (PMFT) and Quantile-Matching adjustment (Wang, 2008)). In order to convert the gust wind speed measurements taken prior to 1993 (implementation of AWS stations) to equivalent AWS 3-s gusts, the wind-tunnel results of Safaei Pirooz and Flay (2018b) were used. Possible effects of local topography were removed using CFD simulations (Safaei Pirooz and Flay, 2018a; Turner *et al.*, 2019).

TREND ANALYSIS

For the estimation of design wind speeds, the upper tail of wind speed distributions is important, thus, here we evaluated the long-term changes in extreme winds. In this study, we analysed the spatiotemporal trends in two parameters of maximum gust wind speeds: *(i)* the magnitudes (in m s^{-1}) of annual and seasonal maximum

Station Name (ID)	Longitude (deg. E)	Latitude (deg. S)	Height a.s.l (m)	Wind data availability	Anemo. Type / Height (m)	Gust/mean duration (s)
Wellington (3445)	174.81	- 41.33	4	1972 – 1993	MK II / 11	~1 / 600
	174.81	- 41.33	4	1994 – 2017	WAA151 / 7	3 / 600
Auckland (1962)	174.79	- 37.01	7	1972 – 1993	MK II / 10	~1 / 600
	174.79	- 37.01	7	1994 – 2017	WAA151 / 10	3 / 600
Christchurch (4843)	172.54	- 43.91	37	1972 – 1993	MK II / 10	~1 / 600
	172.54	- 43.91	37	1994 – 2017	WAA151 / 10	3 / 600
Invercargill (5814, 11104)	168.33	- 46.42	1	1972 – 1993	MK II / 10	~1 / 600
	168.32	- 46.41	1	1994 – 2017	WAA151 / 10	3 / 600

Table 1: Description of the meteorological stations used in this study

gust speeds; and *(ii)* the frequencies (in days) of occurrence of maximum daily gusts exceeding 90th, 95th and 99th percentiles for 1972-2017. The nonparametric correlation coefficient of Mann-Kendall's tau-b (Kendall and Gibbons, 1990) was applied to assess the statistical significance of the linear trends at different time scales, i.e. annual and seasonal, by determining significant trends at two *p* value thresholds, namely at 0.05 and 0.10. The trend analysis is based on the application of the Sen's slope method (Gilbert, 1987), and trends in the magnitudes and frequencies are reported in m s^{-1} $decade^{-1}$ and days $decade^{-1}$, respectively. Seasons are as follows: spring (September-November; SON), summer (December-February; DJF), autumn (March-May; MAM), and winter (June-August; JJA).

	Wellington	Auckland	Christchurch	Invercargill
Annual	– 0.186	– 0.147	**– 0.503**	(– 0.435)
Spring (SON)	– 0.251	+ 0.252	+ 0.255	– 0.171
Summer (DJF)	+ 0.412	– 0.211	– 0.236	– 0.267
Autumn (MAM)	**– 0.531**	– 0.670	**– 0.689**	– 0.589
Winter (JJA)	– 0.362	– 0.455	– 0.615	**– 0.099**

Table 2: Annual and seasonal trends in maximum gust wind speeds (m s^{-1} $decade^{-1}$). Statistically significant trends are defined as those p < 0.10 (in bold) and p < 0.05 (in bold and in parenthesis)

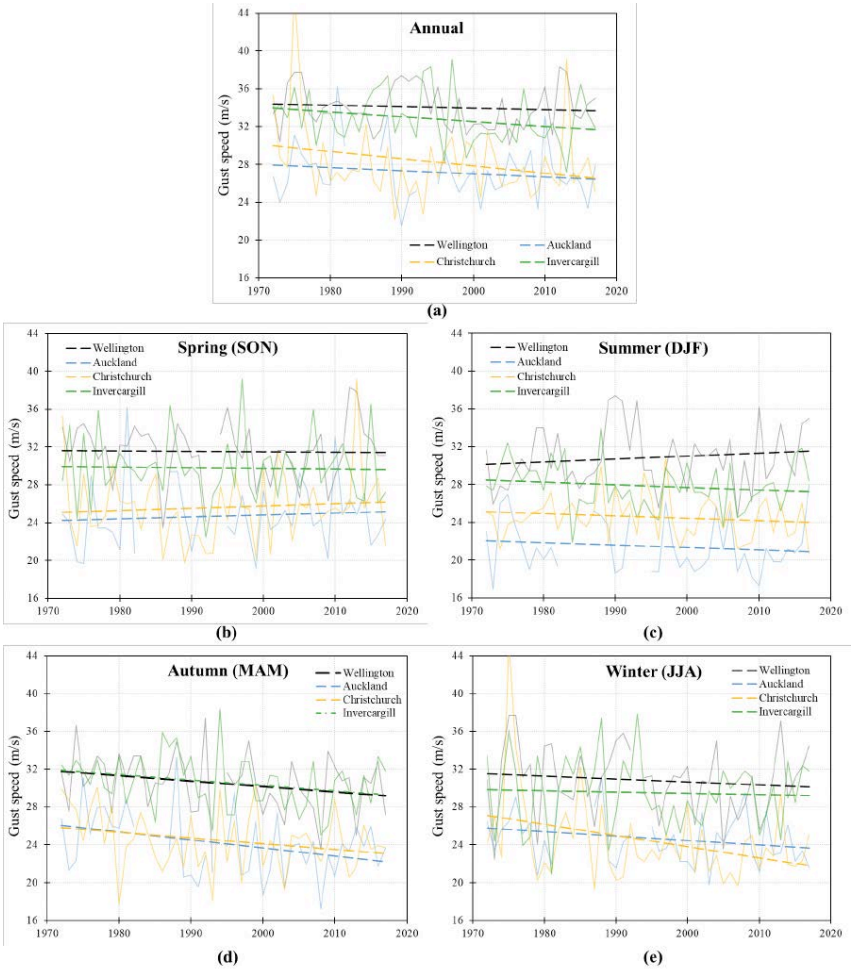


Figure 4: Trends in the magnitudes of maximum annual and season gust speeds. Dashed lines are the best-fit linear trends.

RESULTS

TRENDS IN MAGNITUDES OF EXTREME WINDS

Magnitudes of maximum gust speeds shown in Figure 4 generally have decreasing trends at all the stations in all seasons, except at Auckland and Christchurch stations where the trends are positive in spring; also at Wellington station in summer the maximum gust speeds showed a positive trend. It is evident that for all considered stations the trends are negative the majority of the time (see Table 2). Autumn and winter had the strongest downward trends (mostly significant at $p < 0.10$) at all the considered stations. Annually, all the stations experienced a decreasing trend, and the strongest trends happened at Invercargill (at $p < 0.05$) and Christchurch (at $p < 0.10$).

TRENDS IN FREQUENCIES OF EXTREME WINDS

Annual and seasonal trends in the number of days during which the daily maximum gust wind speeds exceeded the 90th, 95th and 99th percentiles of maximum daily gusts at each station during 1972-2017 are assessed in this section.

As can be seen in Figure 5, the only seasonal positive trend in the number of days exceeding the 90th percentiles has happened in spring at Wellington and in spring and autumn at Christchurch. In addition, annually there is a non-significant positive trend for Christchurch, and at the rest of the stations, the annual trends are negative. The most significant negative seasonal trends in 90th percentile occurred at Auckland in summer (at $p < 0.05$) and at Wellington in autumn (at $p < 0.10$).

For 95th and 99th percentiles (see Table 3), there is a declining annual trend at all stations, with the most significant trend at Invercargill station in 99th percentile ($p < 0.05$). Autumn and winter experienced the strongest decreasing trends at all stations. Regarding the most extreme winds (i.e. 99th percentile), the trends in frequency are negligible for Wellington and Invercargill, though, Auckland and Christchurch had strong declining trends, particularly in autumn and winter, mostly significant at $p < 0.10$.

Table 3 shows that annually and seasonally the trends in the occurrence

continued on page 18

continued from page 17

of extreme winds are generally negative. It is worth noting that trends in the frequencies of extreme winds exceeding higher percentiles (i.e. 95th and 99th) become smaller or even negligible for 1972-2017, compared to 90th percentile. Overall, the negative trends in the frequencies agree with the magnitude trends.

SUMMARY AND DISCUSSION

The study presented annual and seasonal trends in the magnitudes and frequencies of maximum gust wind speeds recorded at four stations across New Zealand for 1972-2017. In order to eliminate all the artificial breakpoints and shifts in wind gust data series, the observed data were subjected to a robust homogenisation algorithm (Turner *et al*., 2019). Generally, trends in both magnitudes and frequencies of maximum gust wind speeds were negative. Annually, the strongest downward trends in the magnitudes of extreme winds were observed at Christchurch and Invercargill. In addition, autumn and winter experienced strongest negative magnitude and frequency trends compared to other seasons. The results demonstrated that the trends in the frequency of the upper tail of extreme wind speed distributions

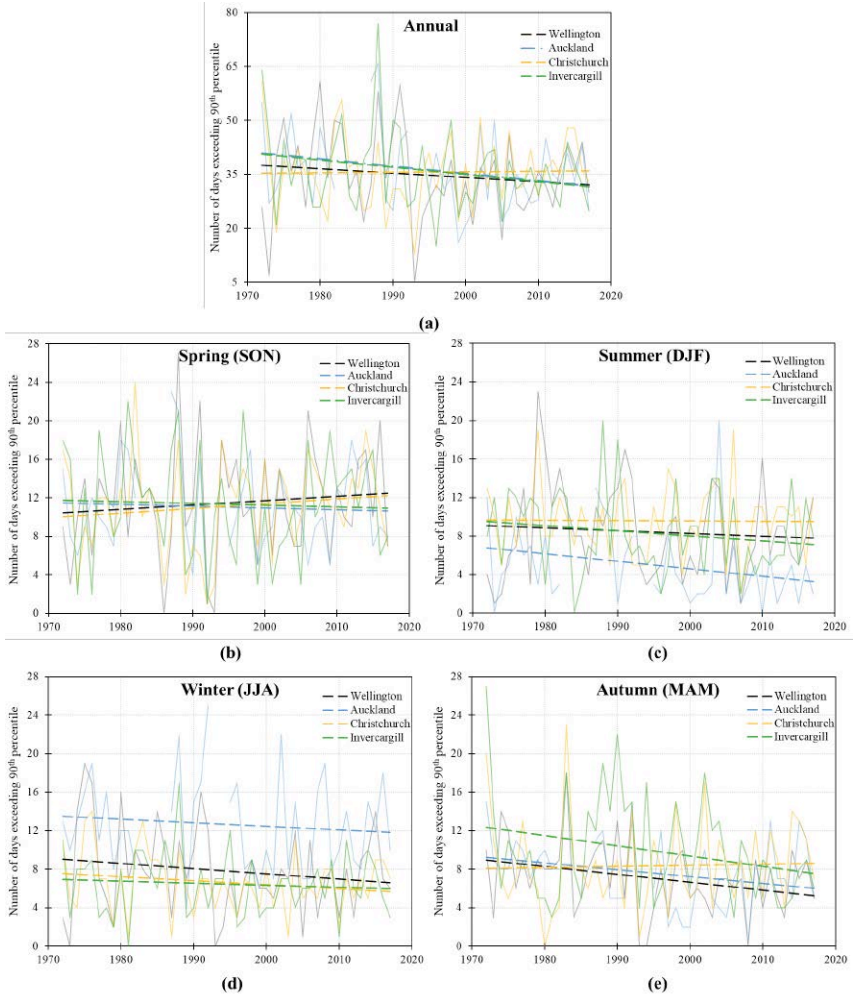


Figure 5: Annual and seasonal number of days when daily maximum gusts exceeded the 90th percentile of whole period from 1972-2017. Dashed lines are the best-fit linear trends

Percentile		Wellington	Auckland	Christchurch	Invercargill
90th	Annual	− 1.25	− 1.43	+ 0.50	− 1.43
	Spring (SON)	+ 0.37	+ 0.00	+ 0.45	+ 0.00
	Summer (DJF)	+ 0.00	**(− 0.77)**	+ 0.00	− 0.45
	Autumn (MAM)	**− 0.71**	− 0.67	+ 0.31	− 0.81
	Winter (JJA)	+ 0.00	− 0.25	+ 0.00	+ 0.00
95th	Annual	− 1.00	− 0.50	− 1.11	− 1.00
	Spring (SON)	+ 0.31	+ 0.32	+ 0.00	+ 0.00
	Summer (DJF)	+ 0.00	+ 0.00	+ 0.00	+ 0.00
	Autumn (MAM)	**(− 0.43)**	**− 0.50**	+ 0.00	**− 0.56**
	Winter (JJA)	+ 0.00	− 0.57	**(− 0.56)**	+ 0.00
99th	Annual	+ 0.00	− 0.36	− 0.37	(− 0.30)
	Spring (SON)	+ 0.00	+ 0.00	+ 0.00	+ 0.00
	Summer (DJF)	+ 0.00	+ 0.00	+ 0.00	+ 0.00
	Autumn (MAM)	+ 0.00	**− 0.26**	**(− 0.25)**	+ 0.00
	Winter (JJA)	+ 0.00	**− 0.19**	**− 0.20**	+ 0.00

Table 3: Annual and seasonal trends in the number days when daily gusts exceeded 90th, 95th and 99th percentiles for 1972-2017 (in days decade-1). Statistically significant trends are defined as those p < 0.10 (in bold), p < 0.05 (in bold and parenthesis)

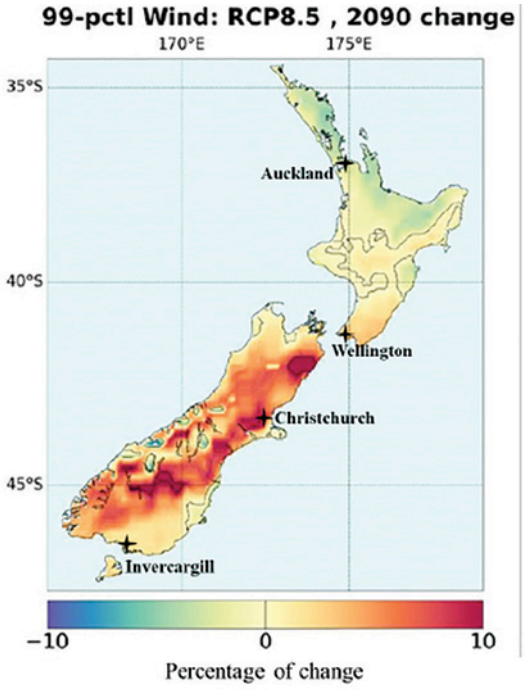


Figure 6: Percentage change in the magnitude of the 99th percentile of "daily-mean" wind speed for RCP8.5 scenario by the end of the 21st century relative to the daily 99th percentile in the baseline 1986–2005 period (Ministry for the Environment, 2018)

(i.e. 95th and 99th), which are important in the estimation of design wind speeds, have not changed significantly. It is worth noting that our analysis supports a decreasing trend in wind speeds reported by many researchers around the globe (Azorin-Molina *et al.*, 2016; McVicar *et al.*, 2012).

Considering the mostly negative trends in long-term changes in annual and seasonal extreme wind speeds, and also negligible trends in the frequency of occurrence of extreme winds, it seems that at this stage, the proposed regional wind speeds for the next version of AS/NZS1170.2 computed using extreme value analysis based on long-term historical wind data (Safaei Pirooz *et al.*, 2018) are accurate and conservative enough. However, it must be pointed out that the findings of the current study are preliminary results, as it is based on four stations. Therefore, now more work is underway to investigate the long-term trends of more stations across New Zealand, and the results will be reported in future conference and journal articles.

Recently, Ministry for the Environment (2018) reported projected overall changes in various climate variables under different climate change scenarios, using the Regional Climate Model (RCM) and NIWA's Virtual Climate Station Network (VCSN), comprising observational datasets and interpolation of data to cover all New Zealand (Tait *et al.*, 2006). Figure 6 shows the percentage of changes in the magnitude of 99th percentile of daily-mean wind speed under one the most severe of the climate change scenarios, RCP8.5, by year 2090 relative to the daily 99th percentile in the baseline 1986-2005 period. Most part of the North Island experiences a reduction in wind speeds, which agrees with our findings for Auckland (i.e. negative trends in magnitude and frequency). However, the increasing trends in Wellington, Christchurch and Invercargill areas reported in IPCC 5th assessment (Ministry for the Environment, 2018) are in contrast with our results.

In should be noted that the trends reported by Ministry for the Environment (2018) (Figure 6) is the 99th percentile of "daily-mean" wind speed, and not "maximum" gust wind speeds reported in this paper. Another point is that, it seems there was no attempt by Ministry for the Environment (2018) to homogenise the observational datasets. Many researchers (e.g. Azorin-Molina *et al.*, 2019; Safaei Pirooz et al., 2018) have demonstrated how homogenisation affects the trends in wind speeds. Therefore, more analyses are required to evaluate the accuracy of the IPCC 5th assessment.

CONCLUSION

Daily and hourly gust and mean wind speeds recorded at four station across New Zealand from 1972 to 2017 were homogenised and trends in magnitudes and frequencies of annual and seasonal extreme winds were evaluated. The main findings of this research are summarised as follows:

1. The magnitude and frequency of wind gust showed negative (significant for some stations and seasons) trends.
2. This result suggests that at this stage no extra multiplier is required to be applied to the New Zealand design wind speeds.
3. Additional analyses of the long-term wind gust trends at more stations across New Zealand are needed.

ACKNOWLEDGMENTS

The research was funded by New Zealand's Ministry of Business, Innovation and Employment through New Zealand Natural Hazard Research Platform. This work was also supported by the project #2017-03780 funded by Vetenskapsrådet.

Amir A. Safaei Pirooz
Department of Mechanical Engineering, The University of Auckland
E: asaf433@aucklanduni.ac.nz

Richard G.J. Flay
Department of Mechanical Engineering, The University of Auckland
E: r.flay@auckland.ac.nz

Richard Turner
NIWA, Wellington
E: richard.Turner@niwa.co.nz

Cesar Azorin-Molina
Regional Climate Group, Department of Earth Sciences, University of Gothenburg
Centro de Investigaciones sobre Desertificación – Spanish National Research Council (CIDE-CSIC)
E: cesar.azorin-molina@gu.se

REFERENCES

AS/NZS1170.2. (2011) *Australia/New Zealand Standard, Structural design actions. Part 2: Wind actions*, jointly published by Standards Australia International Ltd and Standards New Zealand.

Azorin-Molina, C., Guijarro, J. A., McVicar, T. R., Vicente-Serrano, S. M., Chen, D., Jerez, S. and Espírito-Santo, F. (2016) 'Trends of daily peak wind gusts in Spain and Portugal, 1961–2014' *Journal of Geophysical Research: Atmospheres*, Vol. 121, No. 3: 1059-1078, DOI:10.1002/2015JD024485.

Azorin-Molina, C., Guijarro, J. A., McVicar, T. R., Trewin, B. C., Frost, A. J. and Chen, D. (2019) 'An approach to homogenize daily peak wind gusts: An application to the Australian series' *International Journal of Climatology*, Vol. 39, No. 4: 2260-2277, DOI:10.1002/joc.5949.

Azorin-Molina, C., Vicente-Serrano, S. M., Mcvicar, T. R., Jerez, S., Sanchez-Lorenzo, A., López-Moreno, J. -., Revuelto, J., Trigo, R. M., Lopez-Bustins, J. A. and Espírito-Santo, F. (2014) 'Homogenization and assessment of observed near-surface wind speed trends over Spain and Portugal, 1961-2011' *Journal of Climate*, Vol. 27, No. 10: 3692-3712, DOI:10.1175/JCLI-D-13-00652.1.

Cusack, S. (2013) 'A 101 year record of windstorms in the Netherlands' *Climatic Change*, Vol. 116, No. 3-4: 693-704, DOI:10.1007/s10584-012-0527-0.

Gilbert, R. O. (1987) 'Sen's nonparametric estimator of slope' in: *Statistical Methods for Environmental Pollution Monitoring*, Van Nostrand Reinhold Company Inc: New York, 217-219.

Hewston, R. and Dorling, S. R. (2011) 'An analysis of observed daily maximum wind gusts in the UK' *Journal of Wind Engineering and Industrial Aerodynamics*, Vol. 99, No. 8: 845-856, DOI:10.1016/j.jweia.2011.06.004.

Jiang, Y., Luo, Y., Zhao, Z. and Tao, S. (2010) 'Changes in wind speed over China during 1956-2004' *Theoretical and Applied Climatology*, Vol. 99, No. 3-4: 421-430, DOI:10.1007/s00704-009-0152-7.

Kendall, M. G. and Gibbons, J. D. (1990) *Rank correlation methods*, New York: Oxford Univ. Press.

Kruger, A. G., Goliger, A. M., Retief, J. V. and Sekele, S. (2010) 'Strong wind climatic zones in South Africa' *Wind and Structures, an International Journal*, Vol. 13, No. 1: 37-55, DOI:10.12989/was.2010.13.1.037.

Masters, F. J., Vickery, P. J., Bacon, P. and Rappaport, E. N. (2010) 'Towards Objective, Standardized, Intensity Estimates from Surface Wind Speed Observations' *Bulletin of the American Meteorological Society*, Vol. 91: 1665-1681, DOI:10.1175/2010BAMS2942.1.

McVicar, T. R., Roderick, M. L., Donohue, R. J., Li, L. T., Van Niel, T. G., Thomas, A. and Dinpashoh, Y. (2012) 'Global review and synthesis of trends in observed terrestrial near-surface wind speeds: Implications for evaporation' *Journal of Hydrology*, Vol. 416-417: 182-205, DOI:10.1016/j.jhydrol.2011.10.024.

Ministry for the Environment (2018) *Climate Change Projections for New Zealand: Atmosphere Projections Based on Simulations from the IPCC Fifth Assessment (2nd Ed.)*, Wellington, New Zealand: Ministry for the Environment.

Németh, C. P., Radics, K. and Bartholy, J. (2011) 'Seasonal variability of wind climate in Hungary' *Acta Silvatica Et Lignaria Hungarica*, Vol. 7: 39-48.

NIWA, Cliflo (2018) *Web system that provides access to New Zealand's National Climate Database*, available from https://cliflo.niwa.co.nz/ (last accessed 6 June 2019).

NIWA (2019) *Natural Hazards: Extreme weather - winds and tornadoes*, available from https://www.niwa.co.nz/natural-hazards/hazards/extreme-weather-winds-and-tornadoes (last accessed 6 June 2019).

NOAA National Centres for Environmental Information (NCEI) (2018) *U.S. Billion-Dollar Weather and Climate Disasters*, available from https://www.ncdc.noaa.gov/billions/ (last accessed 6 June 2019).

Powell, M. D., Houston, S. H. and Reinhold, T. A. (1996) 'Hurricane Andrew's landfall in South Florida. Part I: Standardizing measurements for documentation of surface wind fields' *Weather and Forecasting*, Vol. 11, No. 3: 304-328.

Pryor, S. C., Barthelmie, R. J., Young, D. T., Takle, E. S., Arritt, R. W., Flory, D. and Roads, J. (2009) 'Wind speed trends over the contiguous United States' *Journal of Geophysical Research Atmospheres*, Vol. 114, No. 14: 1-18, DOI:10.1029/2008JD011416.

Roderick, M. L., Rotstayn, L. D., Farquhar, G. D. and Hobbins, M. T. (2007) 'On the attribution of changing pan evaporation' *Geophysical Research Letters*, Vol. 34, No.17: 1-6, DOI:10.1029/2007GL031166.

Safaei Pirooz, A. A. and Flay, R. G. J. (2018a) 'Comparison of Speed-Up Over Hills Derived from Wind-Tunnel Experiments, Wind-Loading Standards, and Numerical Modelling' *Boundary-Layer Meteorology*, Vol. 168, No.2: 213-246, DOI:10.1007/s10546-018-0350-x.

Safaei Pirooz, A. A. and Flay, R. G. J. (2018b) 'Response characteristics of anemometers used in New Zealand' in: *The 19th Australasian Wind Engineering Society Workshop*, Torquay, Victoria.

Safaei Pirooz, A. A., Flay, R. G. J. and Azorin-Molina, C. (2018) 'Homogenisation of daily wind gusts recorded at Auckland and Wellington airports during 1972 – 2017' in: *European Geosciences Union General Assembly 2018 (EGU)*, Vienna, Austria, DOI:10.13140/RG.2.2.28072.67842.

Safaei Pirooz, A. A., Flay, R. G. J. and Turner, R. (2018) 'Effects of site relocation and instrument type on recorded wind data characteristics at Wellington Airport' in: *The 19th Australasian Wind Engineering Society Workshop*, Torquay, Victoria.

Safaei Pirooz, A. A., Turner, R. and Flay, R. G. J. (2018) 'New Zealand Gust Climatology Part II: Revising New Zealand Regional Wind Speeds' in: *NZ Hydrological Society and NZ Meteorological Society Joint Conference*, Christchurch, New Zealand.

Smits, A., Klein Tank, A. M. G. and Können, G. P. (2005) 'Trends in storminess over the Netherlands, 1962-2002' *International Journal of Climatology*, Vol. 25, No. 10: 1331-1344, DOI:10.1002/joc.1195.

Suomi, I. and Vihma, T. (2018) 'Wind gust measurement techniques - From traditional anemometry to new possibilities' *Sensors*, Vol. 18, No. 4: 1-27, https://doi.org/10.3390/s18041300.

Tait, A., Henderson, R., Turner, R. and Zheng, X. (2006) 'Thin plate smoothing spline interpolation of daily rainfall for New Zealand using a climatological rainfall surface' *International Journal of Climatology*, Vol. 26, No. 14: 2097-2115, DOI:10.1002/joc.1350.

Turner, R., Safaei Pirooz, A. A., Flay, R. G. J., Moore, S. and Revell, M. (2019) 'Use of High-Resolution Numerical Models and Statistical Approaches to Understand New Zealand Historical Wind Speed and Gust Climatologies' *Journal of Applied Meteorology and Climatology*, Vol. 58: 1195-1218 DOI: https://doi.org/10.1175/JAMC-D-18-0347.1.

Usbeck, T., Wohlgemuth, T., Dobbertin, M., Pfister, C., Bürgi, A. and Rebetez, M. (2010) 'Increasing storm damage to forests in Switzerland from 1858 to 2007' *Agricultural and Forest Meteorology*, Vol. 150, No. 1: 47-55, DOI:10.1016/j.agrformet.2009.08.010.

Wang, X. L. (2008) 'Penalized maximal F test for detecting undocumented mean shift without trend change' *Journal of Atmospheric and Oceanic Technology*, Vol. 25, No. 3: 368-384, DOI:10.1175/2007JTECHA982.1.

Wehrli, A., Herkendell, J. and Jol, A. (2010) *Mapping the impacts of natural hazards and technological accident in Europe*, European Environment Agency (EEA), Technical Report 13/2010, Copenhagen, Denmark.

AFL'S INAUGURAL EMERGENCY SERVICES MATCH

Story courtesy of afl.com.au

Photos supplied by Hawthorn Football Club

Hawthorn and Collingwood football clubs faced off at the MCG in Round 16 (5 July) of the 2019 AFL season in recognition and celebration of the work of emergency services workers from across Victoria.

Partnering with Emergency Management Victoria, Victoria Police, Ambulance Victoria, Metropolitan Fire Brigade, Country Fire Authority, Life Saving Victoria, Forest Fire Management, Victorian State Emergency Service and ESTA (Triple Zero), the Emergency Services Match used the power of football to shine a light on the men and women who do extraordinary things, risking their lives every day to protect and support our communities.

The game provided an opportunity to raise much-needed funds for the Emergency Services Foundation, an organisation established in 1983 after the Ash Wednesday fires, which supports emergency services workers in times of need through a range of support services.

More than half of all employees and volunteers in emergency services are likely to experience a traumatic event that will deeply affect them during their career.

The Emergency Services Match aimed to raise awareness of the mental health issues faced by the people doing this vital work in our communities.

In launching the match, Hawthorn President Jeff Kennett highlighted the importance of acknowledging the incredible work of all Victoria's emergency services.

"Our emergency services men and women don their uniforms every day with little fanfare, but with an incredible amount at stake, and the Emergency Services Match is our opportunity to thank them for this work," he said.

"Football provides us with a powerful platform to celebrate the contribution these brave individuals make to our community and we are honoured to be able to play in a game that will do exactly this.

Hawka gives the thumbs up to Hawthorn's 4-point win over Collingwood that promoted emergency services.

Emergency services personnel stand tall in front of the MCG ahead of the inaugural Emergency Services Match on 5 July 2019.

"Ensuring this game became a part of the football calendar would not have been possible without cooperation and support of several parties, in particular the Collingwood Football Club and I'd like to personally thank Eddie McGuire and Mark Anderson for supporting this exciting initiative."

BankVic also supported the game as the official presenting partner of the match.

As the bank for Victoria's Police, Health and Emergency Services, BankVic has been supporting frontline police and emergency services personnel in achieving their financial goals for 45 years.

"We see the tireless contribution our members make everyday," said BankVic CEO Anthony De Fazio.

"At BankVic we serve those who serve the community. We are delighted to partner with the Hawthorn Football Club to recognise and celebrate Victoria's frontline police and emergency services personnel.

In addition to BankVic, both the Victorian Government and TAC have also joined as proud partners of the game.

LONDON TERRORIST ATTACKS – TWO YEARS ON

Bill **Hoyles**

SES Canada Bay (Sydney)

During my visit to England in May and June 2019, the terrorist acts of 3 June 2017 were front and centre in the news as the coroner's inquest opened at the Old Bailey in Court No 1.

Harrowing details of the attack, and eyewitness accounts of the horror and heroism of some of those impacted, were covered in the print media, on television and in the daily transcripts of the inquest available online.

I took time out to visit London on the second anniversary of the attack to spend some time in the area and to attend the special memorial, Choral Evensong service at Southwark Cathedral.

I began with a visit to the Old Bailey to get an external view of a place I had only read about in books. I was aware that the coroner had adjourned the inquest on the day of the second anniversary so I knew it would not be in session when I visited. So, I moved on to London Bridge and Borough Market.

I caught the Underground from Blackfriars to Monument tube station – the latter named because of its lofty memorial to the Great Fire of London and walked down to the Thames and across London Bridge where some had died when the terrorists' vehicle rammed into them.

I noted that there were barriers now blocking each end of the pedestrian footpath on both sides of the bridge.

I descended the stairs into the Borough Market area – only partially open on a Monday – and identified some of the places that had been named in media reports. I saw the permanent plaque in Green Dragon Court, next to Brood Cafe, for James Alexander Meregillano McMullan – described as 'A truly decent human being'. I also saw a couple placing a photograph on a wall, and a card and flowers on an antique bicycle chained below it, for a second victim Sebastian Belanger.

The card was particularly moving with words of love and affection. The couple was joined by others who stood with them, before hugging and shedding a tear.

Moving on, I headed to other significant Borough Market locations – notably The Mudlark Inn and The Black and Blue Restaurant. Eyewitness accounts of the events at this latter location are vividly described in 'Testimony – a memory project, a spoken word performance that was held on the first anniversary at Southwark Cathedral.

Several things struck me as I moved around the Borough Market. Firstly, that Southwark Cathedral is the central hub of the area that the terrorists had targeted. Secondly, that this whole

ABOUT THE 2017 LONDON TERRORIST ATTACKS

On 3 June 2017, a terrorist vehicle-ramming and stabbing took place in London where a van deliberately ploughed into pedestrians on London Bridge before crashing on the bank of the River Thames. Its three occupants fled on foot to nearby Borough Market and began stabbing people in and around restaurants. Eight innocent people were killed, including 28-year-old Australian nurse Kirsty Boden and 21-year-old nanny Sara Zelenak. The three attackers also died. ISIS claimed responsibility for the attack.

terrorist act had only lasted 18 minutes, and thirdly, that the terrorists had not used guns but pink kitchen knives.

Before Evensong I had an opportunity to familiarise myself with the layout of the Cathedral (and meet the resident Cathedral cat). I also visited the Healing Tree – an olive tree planted in a giant pot in the churchyard using potting mix from the composted floral tributes left at London Bridge after the attack. As preparations began for the choral service there was a notable presence by senior police officers, relatives and friends of the deceased, as well as attack survivors. Also in attendance were the Mayor of London, the Mayor of Southwark, the Bishop of Southwark and other senior clergy. Prominent among the senior police was a police constable in dress uniform wearing a solitary red-ribboned medal. I later confirmed this to be the George Medal - second only to the George Cross for civilian gallantry and one of three awarded to police officers arising out of the events of 3 June 2017. The recipient in this case was PC Wayne Marques of the British Transport Police, who had taken on the three knife-wielding terrorists armed only with a baton, and ended up severely wounded having probably saved the lives of many civilians.

He delivered one of two readings – the other being given by a local young community leader Amir Eden who had been instrumental in the production of 'Testimony' a year earlier. Then came the 'Address'. Now I must admit I usually tune out when the Reverend starts preaching – but on this occasion I was struck by the analogy used as the Reverend described his grandmother's love of jigsaws and how it could be seen to be the same process as the inquest being conducted at the time. I had felt when reading various earlier media accounts, and then some of the inquest transcripts, that the picture of what had actually happened is only now emerging – and that earlier timelines and movements of the terrorists had been confused and conflicting. The Reverend talked of how piecing together a jigsaw is similar to conducting an inquest – there is a process by which to arrive at the complete picture. Then by pure coincidence he quoted a passage from the Bible (John 8:32) which just happens to be the same as the words printed on the inside cover of my mobile phone case: "Then you will know the truth and the truth will set you free".

The whole congregation then moved outside into the churchyard to hold a brief ceremony and lay flowers at the Healing Tree. Unfortunately this was the only problematic segment of the whole service – with both the spoken words and the choir being largely drowned out by the rattle of passing trains and the sirens of emergency services vehicles. The bells then tolled eight times – once for each of the eight who had died and then we dispersed. (A second prayer service was conducted that evening starting at 9.58pm when the attack started and ending 18 minutes later with a silence at the time that the terrorists were shot dead).

One final realisation came to me during the addresses at this day of remembrance and that was the proximity of this terrorist act on 3 June 2017 to the Grenfell Tower fire that had occurred less than two weeks later on 14 June 2017.

MEMBERSHIP INFORMATION

Membership forms are available online at www.aies.net.au

NATIONAL COUNCIL
National Secretary
Mobile: 0428 531 302
Email: secretary@aies.net.au
National website: www.aies.net.au

AUSTRALIAN CAPITAL TERRITORY
The Secretary
ACT Division of Australasian Institute of Emergency Services.
Email: secretary.act@aies.net.au

NEW SOUTH WALES AND NEW ZEALAND
The Secretary
NSW Division of Australasian Institute of Emergency Services.
Email: secretary.nsw@aies.net.au

QUEENSLAND AND NORTHERN TERRITORY
The Secretary
QLD Division of Australasian Institute of Emergency Services.
Email: secretary.qld@aies.net.au

SOUTH AUSTRALIA
The Secretary
SA Division of Australasian Institute of Emergency Services.
Email: secretary.sa@aies.net.au

TASMANIA
The Secretary
TAS Division of Australasian Institute of Emergency Services.
Email: secretary.tas@aies.net.au

VICTORIA
The Secretary
VIC Division of Australasian Institute of Emergency Services.
Email: secretary.vic@aies.net.au

WESTERN AUSTRALIA
Email: secretary.wa@aies.net.au

Please forward all mail for all divisions to:
Australasian Institute of Emergency Services (General Council)
PO Box A149,
Sydney South, NSW 1235

THE INSTITUTE'S AIMS

To provide a professional body for the study of the roles and functions of Emergency Services and Emergency Management Organisations throughout Australasia, and the promotion and advancement of professional standards in these and associated services.

THE INSTITUTE'S OBJECTIVES

- To raise the status and advance the interests of the profession of emergency management and counter-disaster services administration.
- To represent generally the views and interests of the profession and to promote a high standard of integrity and efficiency in the skills of emergency and counter-disaster administration.
- To provide opportunities for association among members and students to promote and protect their mutual interest.
- To facilitate full interchange of concepts and techniques amongst members.
- To bring to the notice of the public such matters that are deemed to be important for safety and protection of the community and to promote research and development of emergency services generally.
- To establish a national organisation to foster international co-operation in counter-disaster services administration.

THE INSTITUTE OFFERS

- An opportunity to be part of a progressive Australasia-wide Institute dedicated to the progression and recognition of the Emergency Service role in the community.
- An independent forum where you can be heard and your opinions shared with other emergency service members.
- A journal with information from institutes and other sources around the world in addition to the interchange of views between Divisions in Australia, as well as access to the Institute website.
- Reduced fees for members at Institute Seminars and Conferences and an information service supplied by professional experienced officers.
- A Certificate of Membership.
- The opportunity to use the initials of the particular membership status after your name.
- Corporate members receive a bronze plaque free of charge and can advertise on the AIES website, as well as provide articles for inclusion in the Institute's journal.

MEMBERSHIP

Costs

Annual Subscription:	$60.00
Fellows:	$80.00
Corporate Subscription:	$500.00

Note: Institute Fees may be tax deductible.

Classes
There are four classes of membership:
• Members • Fellows • Life Fellows • Corporate
There are five categories of affiliation with the Institute that may be offered to persons who do not meet the requirements for membership:
• Associate • Student Member • Retired Member
• Honorary Member • Honorary Fellow

ELIGIBILITY

Applications for membership will be considered from persons who are at least eighteen years of age and who:

- Are members of a permanent emergency service or associated service, or
- Are volunteer members of emergency or associated services.

Admission as a member may be granted if in the opinion of the General Council the applicant meets all other conditions of membership and passes such examinations and/or other tests as may be required by General Council.

MEMBERS

Our members come from
• Ambulance Service • Community Services • Emergency Equipment Industry • Emergency Management Organisations • Fire Services • Health, Medical and Nursing Services • Mines Rescue • Police and law enforcement agencies • Safety Officers • SES • Transport Services • Volunteer Marine Rescue • Volunteer Rescue Associations

AIES CONTACTS

General Enquiries	Email: enquiries@aies.net.au	PO Box A149 SYDNEY SOUTH NSW 1235

NATIONAL COUNCIL

President Steve Jenkins FAIES	Email: president@aies.net.au Phone: 0412 753 790
Vice President Robert Maul LFAIES	Email: vice.president@aies.net.au Phone: 0400 521 304
National Secretary Jim Pullin	Email: secretary@aies.net.au Phone: 0428 531 302
National Treasurer Jenny Crump MAIES	Email: treasurer@aies.net.au Phone: 0418 726 224
National Membership/Systems Administrator Wayne Coutts MAIES	Email: membership@aies.net.au Phone: 0458 410 998

AUSTRALIAN CAPITAL TERRITORY

President Scott Milne ESM FAIES	Email: president.act@aies.net.au Phone: 0427 688 856
Secretary Phil Gaden MAIES	Email: secretary.act@aies.net.au Phone: 0413 137 761

NEW SOUTH WALES/ NEW ZEALAND

President Robert Maul LFAIES	Email: president.nsw@aies.net.au Phone: 0400 521 304
Secretary David Parsons FAIES	Email: secretary.nsw@aies.net.au Phone: 0418 273 917

QUEENSLAND/NORTHERN TERRITORY

President Rhys Davis MAIES	Email: president.qld@aies.net.au Phone: 0488 799 376
Secretary Jenny Crump MAIES	Email: secretary.qld@aies.net.au Phone: 0418 726 224

SOUTH AUSTRALIA

President Rodger Halliday LFAIES RFD	Email: president.sa@aies.net.au Phone: 0455 137 043
Secretary Rebecca Hunt MAIES	Email: secretary.sa@aies.net.au Phone: 0438 844 316

TASMANIA

President Ron Jones LFAIES	Email: president.tas@aies.net.au Phone: 0427 008 705
Secretary Peter Geard FAIES	Email: secretary.tas@aies.net.au Phone: 0418 515 649

VICTORIA

President Grant Coultman-Smith MAIES	Email: president.vic@aies.net.au Phone: 0402 457 535
Secretary Bill Little MAIES	Email: secretary.vic@aies.net.au Phone: 0419 871 009

WESTERN AUSTRALIA

President Position Vacant	Email: president.wa@aies.net.au
Secretary Position Vacant	Email: secretary.wa@aies.net.au

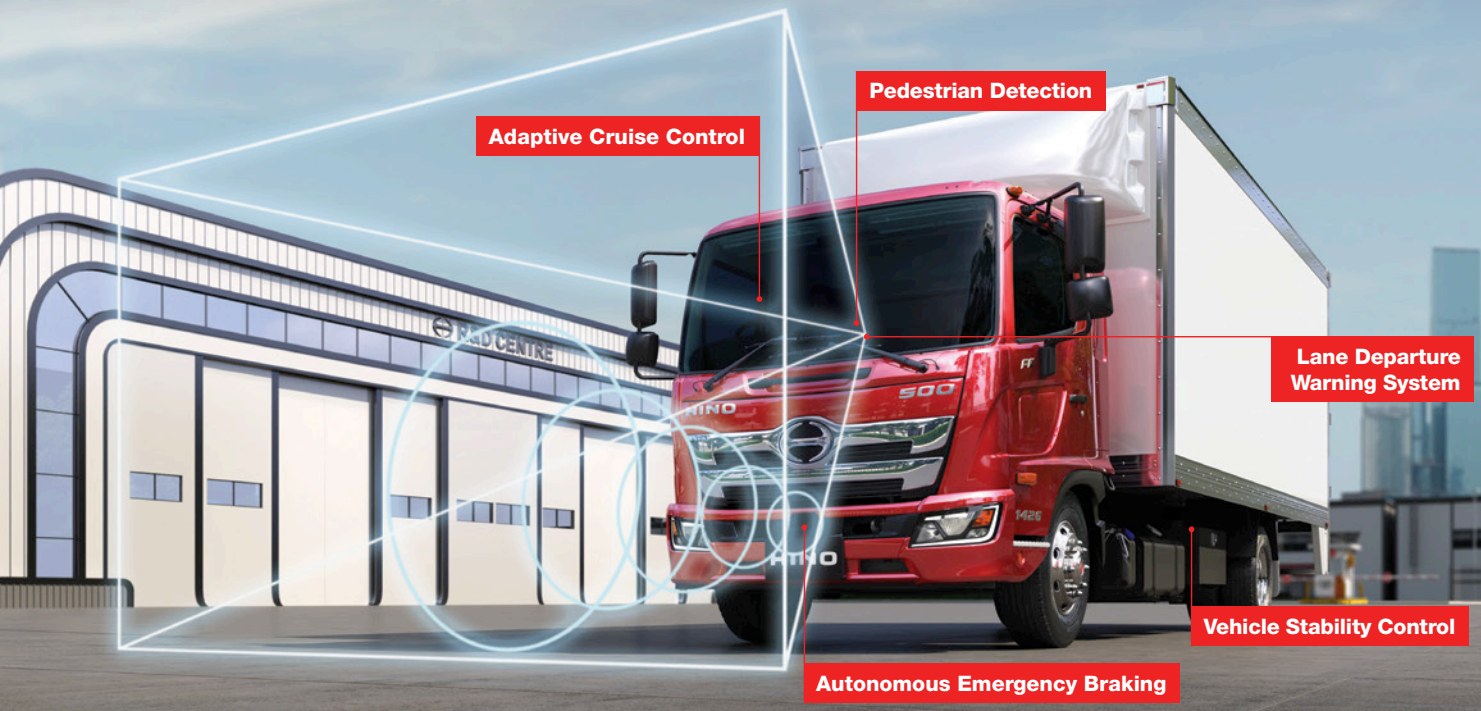
NATIONAL EMERGENCY RESPONSE JOURNAL

Editor Kristi High	Email: editor@aies.net.au Phone: 0407 366 466

SMARTER. TOUGHER. SAFER.

hino.com.au

THAT'S ANOTHER HINO ADVANTAGE



THE ALL-NEW 500 SERIES STANDARD CAB. THE SAFEST JAPANESE TRUCK IN ITS CLASS.

When it comes to reliability and safety you can't afford to take chances. Which is why the SES trust the new Hino 500 Series Standard Cab to always get the job done. Showcasing the latest smart technology and featuring the most advanced active safety package in its class - including a Pre-Collision system (PCS) with Pedestrian Detection, Autonomous Emergency Braking, Adaptive Cruise Control, Vehicle Stability Control and Lane Departure Warning System included as standard. The street smart new Hino. It takes the hard work out of driving. Visit hino.com.au.

*Active safety systems are an aid to assist the driver and have performance limitations. Please refer to our website videos for full details.

XAVIER_HINO36852

A Toyota Group Company

HINO