THE EARLY WARNING NETWORK

Submission

to the

Senate Standing Committees on Environment and Communications

THE AUSTRALIAN EARLY WARNING NETWORK

The capacity of communication networks and emergency warning systems to deal with emergencies and natural disasters

www.ewn.com.au

Introduction

EWN would like to thank the Senate Standing Committee on Environment and Communications for the opportunity to make a submission regarding the capacity of communication networks and emergency warning systems to deal with emergencies and natural disasters.

EWN operates the most experienced and advanced early warning system in operation within Australia today and is uniquely qualified to contribute to the discussion of effective national early warning systems.

In this submission we make particular reference to:

- The effectiveness of communication networks, including telephone, Internet and other alert systems drawing on the spate of emergencies and natural disasters of the 2010/2011 Australian summer and EWNs considerable experience, and
- The ability to warn of the imminent threat of an impending emergency

The above issues coalesce to form what we have identified as a warning gap and lack of cohesiion between local and state authorities within the present system. We also address:

- the impact of emergencies and natural disasters on, and implications for, future communication technologies such as the National Broadband Network
- the scope for better educating people in high-risk regions about the use of communications equipment to prepare for and respond to a potential emergency or natural disaster;
- new and emerging technologies including digital spectrum that could improve preparation for, responses to and recovery from, an emergency or natural disaster.

While this submission explains how the warning gap exists, it mostly seeks to provide a way forward from the bitter lessons learned. In particular and relating to the issue of future preparedness, we wish to draw the Committees attention to existing capabilities that already cover this gap and are already in operation nationally today.

Additional Reading

EWN submission to the Royal Commission 2009 Bushfires
https://www1.ewn.com.au/support/EWN_Submission.pdf

Executive Summary

Recent events have exposed a fatal gap in federal and state early warning systems and their ability to effectively respond to these sorts of disasters. The tragic flooding in the Toowoomba, Lockyer and Brisbane Valleys in particular has brought this into sharp focus. This event could have been warned for several hours earlier.

Drawing on EWN experience in this area, we propose the establishment of a National Early Warning Centre (NEWC). Managed by a team of about seven, the NEWC would

provide initial warning responses for severe weather (nationally) and other events, subsequently handing over to state or local authorities or acting on their instructions. This mirrors the highly successful manner in which EWN operates with Brisbane and Townsville City Councils.

The Warning Gap

Warning systems are far better today than just twelve months ago. The commissioning of the Emergency Alert system by the Federal and State governments has delivered to emergency management a powerful asset in the effort to protect life and property and has already been effectively used many times over.

However, the system did not work in the Toowoomba, Lockyer and Brisbane Valley disasters. Indeed, warnings were issued via EA many hours after the fact. Testimony, police statements and other evidence presented to the enquiry will reveal there was time to warn communities threatened by catastrophic flash flooding including timelines of such awareness. This specific danger to the areas threatened was recognised hours earlier. So despite a known catastrophic threat and the means to deliver an immediate warning, no such action was taken.

Had Lockyer Valley Council been utilising EWN services as do Brisbane and Townsville City Councils, an early warning over multiple channels would have been issued to vulnerable communities. Anthony Cornelius, the Meteorologist who forecast the event hours in advance, works with EWN. As per our practice with the two councils mentioned, we would have called them earlier alerting them of the risk and seeking permission to issue a specific warning.

Through the ongoing flood enquiry, fundamental changes to Queensland flood warning systems are shaping as a key recommendation after suggestions Toowoomba and the Lockyer Valley had little time to prepare for the January 10 inland tsunami.

Elizabeth Wilson, counsel assisting the Queensland Floods Commission said there were a range of serious questions associated with the most lethal floods which struck Queensland communities during the summer of disasters. "There are countless stories in the Lockyer Valley detailing the lack of warning received about the wall of water,"

The Weather Bureau's Queensland director Jim Davidson said "The bureau is not responsible for flash flood warnings, it is very much a local government area." Jim Davidson is mostly right; this is where local knowledge is essential in understanding which communities are vulnerable to certain threats. It is impossible for the Weather Bureau to have a clear picture of vulnerabilities at that level. This is where half of the warning gap currently exists.

It should be pointed out this is not criticism of Emergency Management or the Bureau of Meteorology. State and local emergency management did an amazing job and the BOM did have a current warning in effect. Instead, the failure to warn drives from the lack of a well-defined and a dedicated Early Warning System (EWS) that would have been situationally aware and in direct communication with local emergency management. An Emergency Alert system does not an Early Warning System make. The Emergency Alert

system utilised by EMQ during recent events is not an Early Warning System (EWS), it is a mechanism. EMQ used it a lot, but the two capabilities should not be confused.

"An Emergency Alert system does not an Early Warning System make."

Had a dedicated EWS been operating prior to the Toowoomba, Lockyer and Brisbane Valley disasters, residents would most probably have been warned or received some notification several hours prior to the event.

Prior to Black Saturday and as far back as 2007 EWN had suggested to state governments the need to establish an EWS for severe weather, fire and other potential threats (See EWN submission to the Royal Commission 2009 Bushfires). After the Black Saturday tragedy, an emergency alert system was implemented, but not an EWS.

A dedicated EWS also delivers a different psychology within emergency management. No longer is the responsibility of warning or awareness splintered over various disciplines and authorities. There is instead a sharp focus on all threats and what the community needs to know. This was one of the greatest failings on Black Saturday – no one was in charge of warnings.

So what is the difference between what authorities do now and an EWS? An EWS is the combination of the mechanism for sending warnings such as EA combined with a dedicated operation which continuously monitors threats and is responsible for the issuing of warnings. Currently the only dedicated early warning system in operation within Australia today is the Early Warning Network. While EWN provides services to some councils and commercial enterprise, it had no such relationship with the Toowoomba, and Lockyer Valley Regional Councils. We wish we had.

The present manner in which threats are monitored and warnings are triggered leaves a critical and often fatal warning gap when a severe event becomes catastrophic. This is called the Moment of Escalation or MOE. A dedicated EWS would be situationally aware and is less likely to get caught with its pants down during an MOE. As in the case of the Toowoomba, Lockyer and Brisbane Valley disasters, that moment would have been anticipated.

Why Listen to EWN?

EWN has been operating a national early warning centre for nearly four years and is the first ever location based alert service for severe weather. It is the efforts of EWN that have proved the viability and benefits of such services and the capabilities and practices needed to power them. The operation is unique and has developed specialised IP and systems to manage such an operation accumulating significant experience and capability along the way.

Nationally EWN monitors potentially dangerous incidents and tracks severe weather in real time alerting people directly in its path. Events include storms with potential for hail, flash flooding or damaging winds, fires, tsunami etc. The service is available to the public, business and government. EWN is the only operator of such a service anywhere.

Since commencing operations in late 2007 the service has sent over 8,250 warnings (each warning may include thousands of members) for severe weather, flooding, tsunami and other critical notifications. EWN has warned for every severe event in Australia since it commenced operations without any outage of service. This 24x7 operation has been effectively managed with just a handful of people.

A key element of EWN's service is the geographic information system that enables true location based services. People, organisations or devices are registered to the system then located via fixed or mobile latitude and longitude co-ordinates. Within the alert and mapping engine of EWNs system, data such as weather is spatially overlaid on alert maps providing unprecedented situational awareness and accuracy in such events as emergency notification. EWN's location based services also provide the ability to track, locate and alert mobile phones based on their physical location at the time.

Lessons are being learned. For example, just before 8am on 19 April an Emergency Alert was issued for Roma with a major flood level predicted. While the outcome of the Tablelands rain event was not catastrophic the alert should be seen as a positive application of the EA system.

While we have seen many of these recent disasters coming, others ambush the emergency management system, catching us by surprise. The lesson here is that a facility needs to be in place that is situationally aware, does not have to 'gear up' and can act immediately under its own authority. Such disasters will strike again resulting in fatalities, injuries and property loss that could be avoided.

Vulnerable Communities

The devastated communities in the Lockyer Valley were known to be vulnerable to flash flooding. Even in Toowoomba, the manner in which waterways had been developed and how they managed flood water was known to be a problem. Being aware of these issues, how can these risks be treated in future? How EWN works with Brisbane City Council provides an example of how such disasters might be mitigated. Like most authorities, Brisbane City Council has identified areas vulnerable to specific and predictable threats. In Brisbane, EWN's warning system maintains shape files for various high tide events as well as areas prone to flash flooding. For example, the system accurately identifies anybody living on or below a 1.8m, 2m high tide mark. These people can subsequently be warned over multiple channels with the click of a button. This ensures only those that need it, get it, thus avoiding confusion and panic. These capabilities are further augmented with stream and flood gauges that trigger alerts into the EWN system when water levels reach a certain height or rainfall over a thirty minute period exceeds set parameters.

Better Informed Communities

EWN has proven that opt-in systems are highly successful and work well in tandem with the EA system. The Townsville opt-in service, now being closely followed by Brisbane, has experienced such a high take-up that almost complete penetration of the community has been realised. Residents who opt-in are actively seeking more information in a timely manner. This permission to warn and inform over multiple channels results in a community far better prepared instead of waiting to the last

minute. Opt-in permits local emergency management and councils to cover a far greater range of contingencies and greater control of informing their communities than EA can reasonably be expected to. This is not a criticism of EA, but a recognition of the additional benefit of a permission based system running in parallel with EA.

The ability to communicate with the public using email, web, mobile and social networks results in greater community resilience. This is a mechanism and opportunity to help educate people in high-risk regions to prepare for and respond to a potential emergency or natural disaster.

While still in its infancy, the manner in which EWN works with Brisbane City Council is a good example of how early warning systems need to be seamlessly integrated with local emergency management. Local responders are most often the best placed to immediately react to emergencies and likewise best placed to recognise where threats exist and what messages should be conveyed. Attachment

EWN is the most experienced operator of early warning systems in Australia. It is hoped that this experience might be considered by the Senate Standing Committee on Environment and Communications. EWN would like the Committee to consider the benefits of establishing a National Early Warning Centre (NEWC) to help mitigate similar events in the future.

National Early Warning Centre (NEWC)

What might the NEWC look like?

EWN believes serious consideration should be given to a government supported expansion of already operational and proven systems in the form of a National Early Warning Centre (NEWC). This would not require a major undertaking or financial commitment. Current operations would be expanded to comprise a small team of about seven. The NEWC would work directly with BOM, state emergency management and to local authorities. The NEWC would:

- Monitor weather, fire and any other hazards state or nationally 24x7
- Have the authority to issue warnings
- Have access to an opt-in data base system (As per EWN model and the way it operates with Brisbane and Townsville City Councils) and the Emergency Alert system
- Have access to BOM and all other available telemetry
- Have access to local authorities and all other emergency bodies

Subsequent to a moment of escalation the NEWC would probably hand over to state or local authorities or act under their direction.

Social Media and New Technologies

Social Media

Social media has a significant capacity to rapidly pass on detailed information and should be native to any warning system. EWN's experience through its multi-channel system demonstrates the benefits of pushing to such media. An EWN survey revealed over ninety percent of warning recipients pass on SMS and email alerts. So even if delivered to just some, messages can rapidly spread. When it comes to early warning, all and every channel available should be targeted. The total sum of multiple channels realises the greatest penetration of any given community. Today, in addition to traditional communication channels, new media such as facebook or twitter offer the opportunity to provide detailed information, frequent updates and rapid viral distribution. This is why 'opt-in' warning facilities should complement the Emergency Alert system.

When addressing the impact of new and emerging technologies innovation is the key. Small and medium businesses are most frequently the drivers of this innovation and EWN is a good example. After developing and proving a globally unique innovation, EWN offered this to government for free. The purpose of this was to cover a total warning gap until such time as a tender process was initiated for a national system. Unfortunately the opportunity to deploy an already operational system which covered such events as that which occurred in the Victoria on Black Saturday and more recently the Lockyer Valley was lost. Instead, two years and several disasters later, millions have been paid in an effort that has attempted to duplicate the IP and hard work of EWN.

The NBN

The NBN offers the opportunity to 'parcel' early warning notifications as part of its network service to all users. The solution will be fast, location specific, able to provide detailed information on potential threats and offer rapid viral promulgation over multiple channels from each recipient.

Early Warning for Business

For a good part of each day a substantial number of the community are at work. It is the responsibility of employers to take all reasonable measures to ensure a safe working environment. Innovations such as that delivered by EWN are now easily implemented by business to help fulfil their duty of care. Recent events have clearly had an impact on OH&S managers seeking to reduce risk and mitigate against severe weather.

EWN is experiencing a rapid take up of its services tailored to the needs of business. They include companies such as Lend Lease, Origin Energy, Metcash, Suncorp, Elders Insurance, TIO, Patricks, Theiss and so on. Typically large businesses with distributed operations utilise what we call a Severe Weather and Incident Manager and a service called All Alerts. Through these products business can help protect employees, operations and assets exposed to weather risk.

Interestingly many thousands of government employees and departments are registered with our system and enjoy a free service.

Conclusion

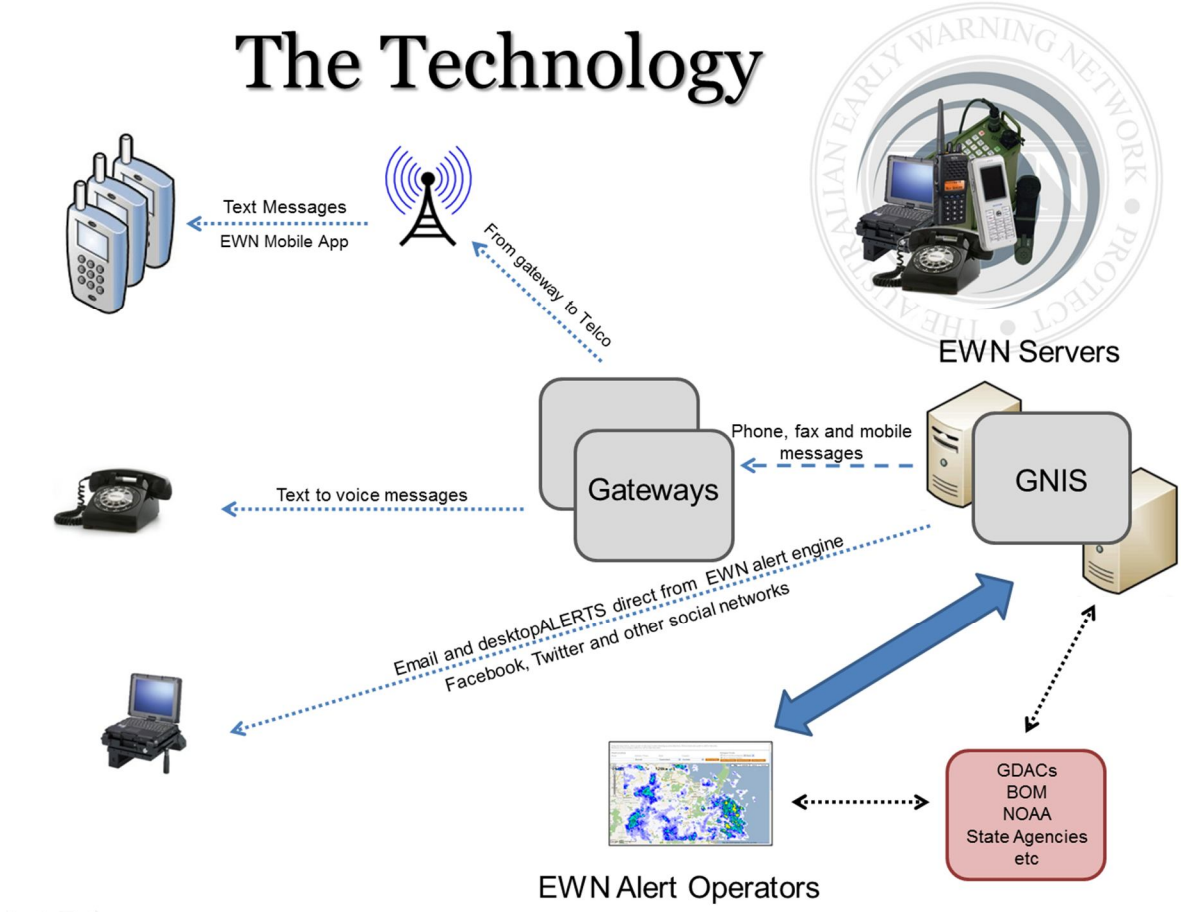
Recent severe weather events have exposed a fatal gap in the process by which early warning is provided to the public when a severe event becomes catastrophic. Solutions to this are readily available. Experienced early warning operators, systems and capabilities not only exist but are already operational within Queensland to cover this gap. A solution might take the form of a dedicated early warning facility supported by government. The expansion of current operations to form a warning centre would be simple, could happen immediately with little expense.

EWN is happy to demonstrate to the Committee the operation of its early warning system and how it is being utilised to help protect life and property.

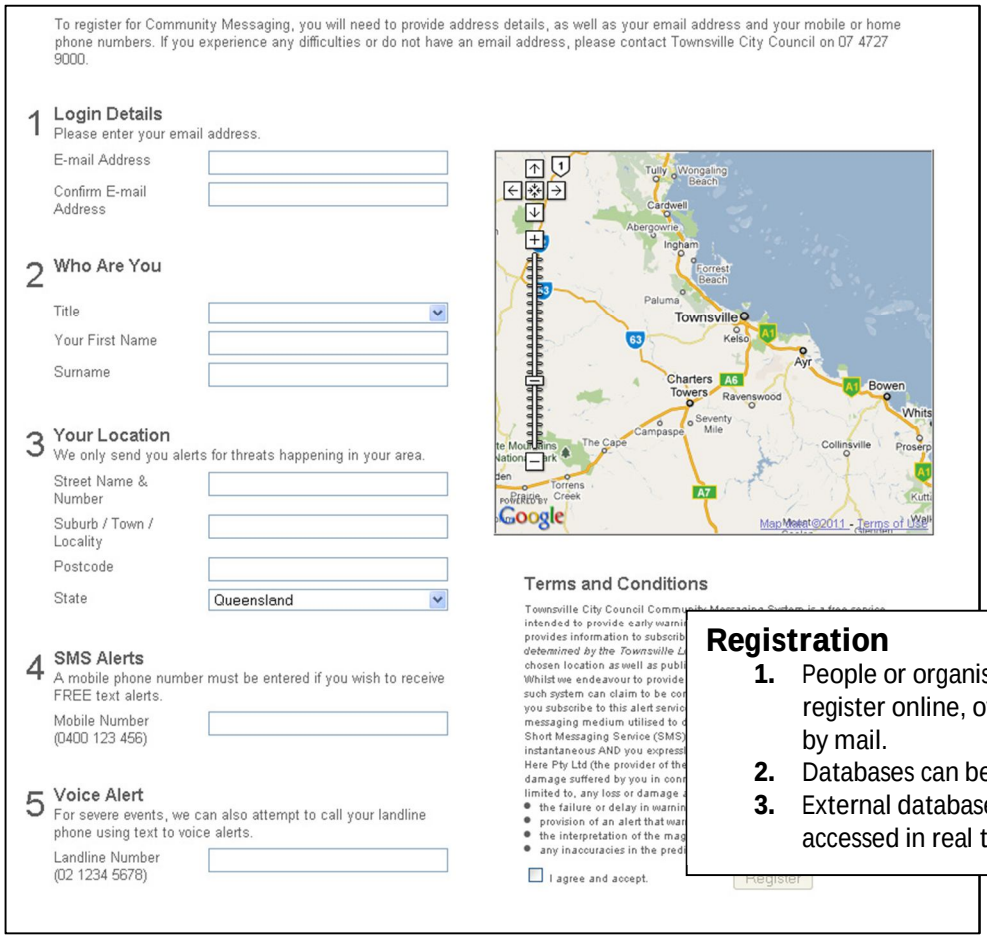
Attachments

The following attachments are provided to help describe how EWN technologies and systems operate:

1. Attachment A. How the system is populated in addition to being able to access any external database such as the IPND. (Our system automatically geo-locates if address details are present)
2. Attachment B. How the system operates with Brisbane City Council
3. Attachment C. Warnings you can understand. Layered warnings. To provide councils and residents situational awareness and context to better understand the meaning of warnings we issue what we call warnings in depth. These include a Daily National Severe Weather Outlook, local Severe Weather and Rainfall Alerts, Pre-alerts and finally real time Location Based Warnings.
4. Attachment D The GIS at work – case study and report on the Melbourne hail
5. Attachment E. AutoAlerts- automatically triggered geographic alerts, mainly for fire and flooding at this time
6. Attachment F. True location based alerts services – alerting mobiles based on their physical location
7. Attachment G. DesktopALERT
8. Attachment H. Business and severe weather management
9. Attachment I. Where EWN started



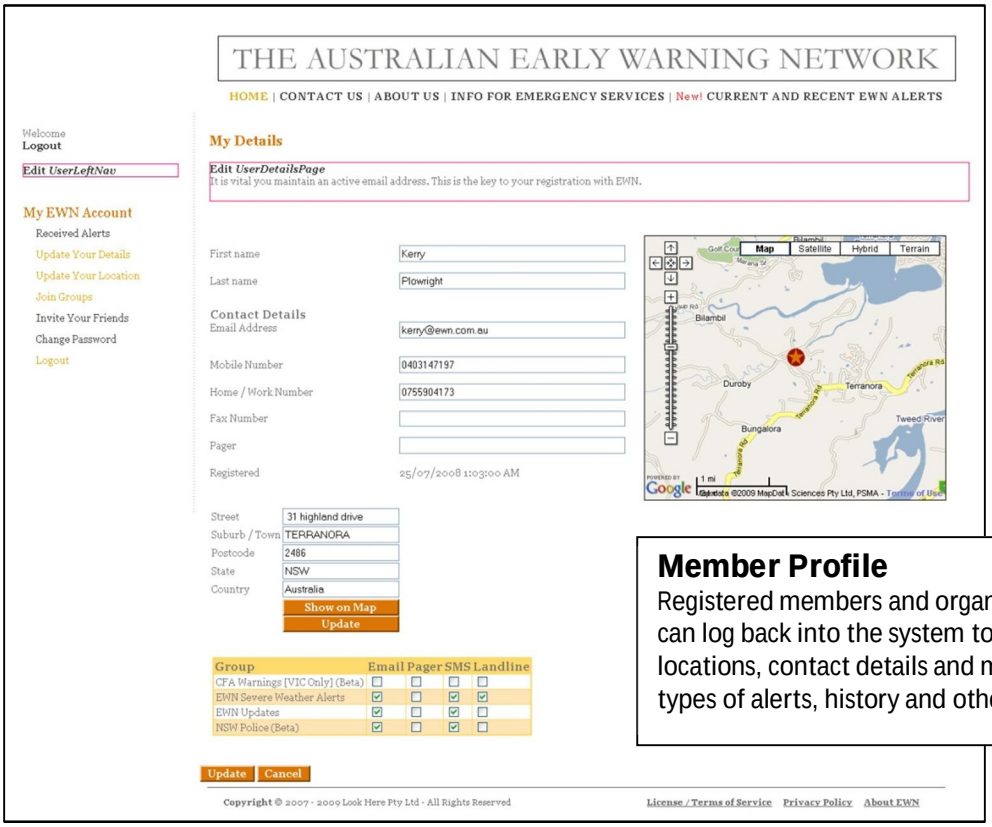
Populating the System



Registration

1. People or organisations can register online, over the phone or by mail.
2. Databases can be imported,
3. External databases can be accessed in real time i.e. the IPND

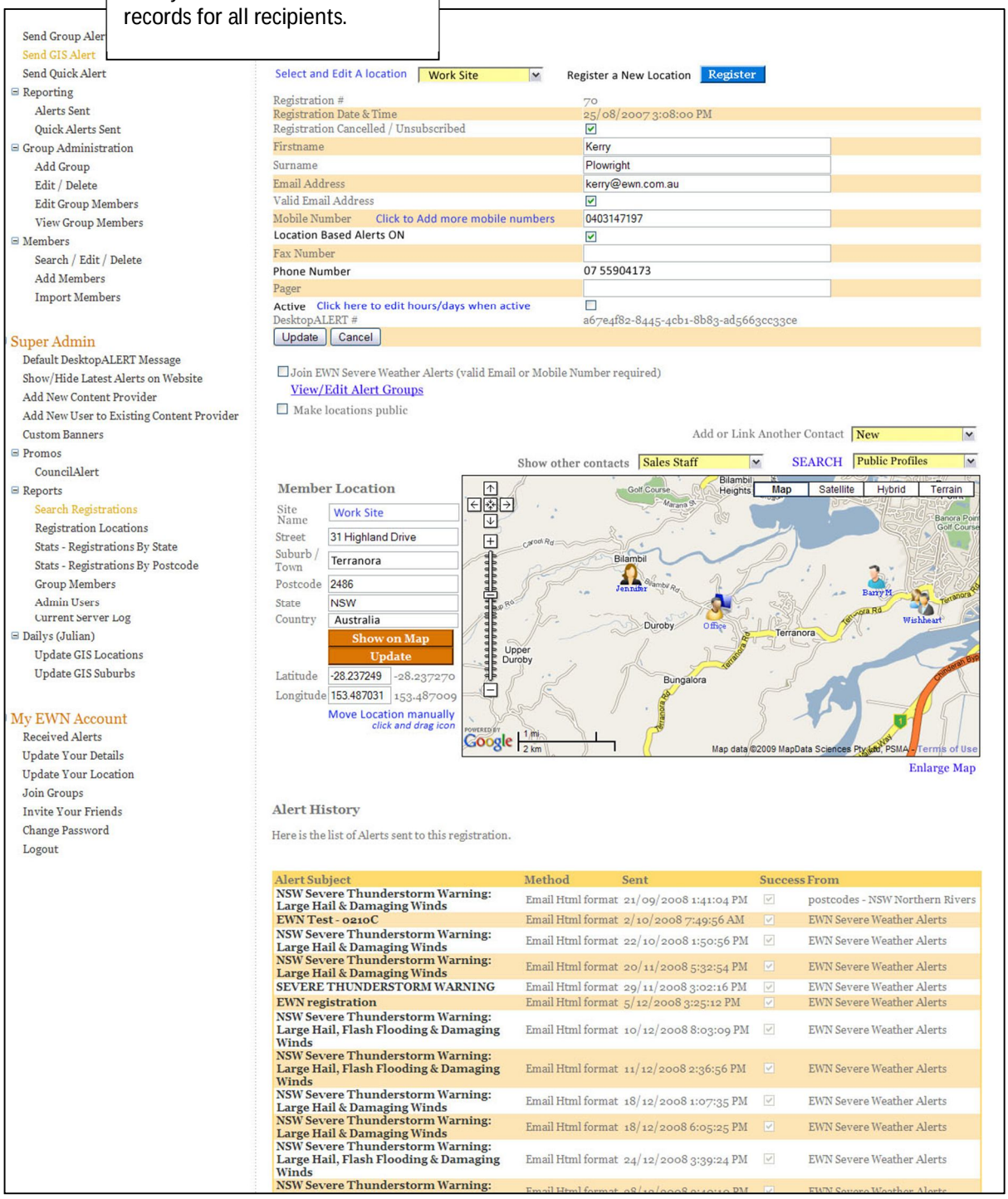
Users can log back in and manage the type of alerts they receive and how they receive them.



Member Profile

Registered members and organisations can log back into the system to manage locations, contact details and methods, types of alerts, history and other settings.

Member Records
The system maintains detailed records for all recipients.



Attachment B

How the Early Warning Network Operates In Brisbane

Introduction

The Early Warning Network (EWN) has been continuously providing early warning services to Brisbane City Council (BCC) since late 2009. Following a yearlong pilot program with EWN, the Brisbane Lord Mayor's Taskforce on Suburban Flooding (LMTSF) established a requirement for local flood advice, forecasting and warning systems. Subsequently in November 2010, Brisbane City Council (BCC) issued an RFT which after careful evaluation of respondents was awarded to EWN.

The RFT and FloodWise Community Access project was specifically concerned with providing:

- creek flood affected residents with warning alerts; and
- residents of Brisbane access to severe weather warning alerts.

BCC residents are able to subscribe to the severe weather alert service:

- online through a dedicated page on the Brisbane City Councils website;
- via the Council's call centre; and
- in writing on an application form lodged with Council

A critical component of the requirement was the capability to define a geographical area likely to be impacted by severe weather and the ability to send alerts to all subscribers within the defined area. When a resident registers to receive warnings, the system automatically geo-locates their address as a latitude and longitude (lat/long). The system utilises the lat/long to determine if a person is in a defined alert area and is accurate to approximately ten metres. In other words a house or property could be selected and alerted from the mapping system, or one side of a street.

The registration process enables customers to be able to choose one or more methods of alert delivery for each service that they register for (sms, email, voice to phone) both on line and via paper registration. The allowable methods of alert being:

- email;
- digitised landline voice message;
- SMS

Subsequent to registration residents are able to change their service, method of alert, location and other details online and to unsubscribe. The scope of the service includes but is not restricted to:

- Registration of residents of Brisbane who wished to subscribe to the alert services at one registration per household;
- Management of registrations including change of details and unsubscribing;
- Verification of creek flood notifications received from Council's FloodWise system;
- Issuing Creek Flooding Alerts to relevant subscribers based on notifications received from Council's FloodWise system and subscribers in the area impacted by the notification;

- Issuing Severe Weather Alerts to subscribers based on information obtained from other sources such as Bureau of Meteorology (BOM) and internal EWN assessments;
- Alerts for Creek Flooding and Severe Weather issued via Email and/or SMS or Voice call to Landline as selected by the subscriber;
- The ability to provide warnings to affected residents for King Tides;
- The ability to alert for other hazards such as bushfire;
- Council ablility to access to the system to issue its own Council authored messages in times of emergency; and
- Provision of customer support for service in terms of problems or enquiries.

Severe Weather Warning Alerts

EWN provides registered Brisbane resident's early warning and advice of potentially severe weather events. Alerts or advisories are based on BOM warnings and/or internal and contracted expert assessment. Alerts are usually issued using a combination EWNs Geographic Notification and Information System (GNIS) and groups. The GNIS enables operators to view locations recently alerted and to whom alerts have already been sent. For any alert issued to BCC residents, a group alert is sent to specified staff informing them of the action and content.

Recent comments to the Floods Commission of Inquiry have reflected on what 'meaning' a recipient might derive from a short message and the potential for undesirable behaviours that might place people at greater risk. This is an excellent point which is why we seek to provide context and situational awareness through a range of alerts leading up to an event. EWN can issue the following types of warnings for severe weather:

1. A national **Severe Weather Outlook** (daily). This provides emergency and OHS managers of large distributed organisations situational awareness at glance;
2. The **Severe Weather and Rainfall Alert** produced for specific locations daily. This expands on situational awareness with a detailed assessment and forecast;
3. **Pre Alerts** are issued to the public within vulnerable locations on days of high threat. If residents receive one of these alerts from us, they need to pay extra attention and take care.
4. **Severe Weather Alerts** are issued over multiple channels for locations expected to be impacted within minutes or hours.

In addition to EWN initiated warnings; EWN also sends notifications to residents at the request of Council or after consultation with Council. Examples include specific warnings and notifications during the recent flooding event, King tide alerts and similar. Consultation occurs with Council emergency management regarding additional alert requirements when the threat environment changes or an escalation occurs or is anticipated. This is very much a 24x7 team environment where all resources are pooled to assist in decision making and the language and behavioural aspect of warnings are front and centre.

Attachment B

Creek Flood Event Notifications Two years ago we built into our system Auto Alerts for bushfire warnings. This process automatically geo-locates fire incidents and sends messages to anyone located within 2km of that location – namely Watch and Act and

Emergency Alerts. We also do the same for flash flooding. Brisbane City Council operates the Flood Wise system. This system utilises a network of gauges that measure rainfall, creek and river levels within areas vulnerable to flooding or flash flooding. A number of these are connected to the EWN system. When activated they send messages via SMS into the EWN Alert Engine. Similar to the bushfire capability these warnings can be automatically delivered to those registered or to a geographic area. We currently capture these alerts so the Alert Operator can authenticate the warning (Cross checks rainfall and other data) before sending it.

Potential creek flooding is recognised when rainfall and creek/stream levels reach predefined trigger points. Creek flood affected residents are then alerted of a potential flood event through the EWN system. Each notification communicates a different message regarding the status of the creek flood event. Residents are expected to carry out their flood ready plans upon advice of a creek flood event. Each local flood/hazard affected community has its own set of creek flood event triggers and different wording for their set of alerts. There are currently three defined notification types:
1. Rainfall indicates likely flooding;
2. Water levels rising indicate flooding likely in next half hour;
3. Water level has peaked.

EWN first receives notification of potential flooding from Council's FloodWise system and verifies the potential flooding situation using:

- Prevailing weather patterns;
- Radar images;
- Rainfall observations;
- Rainfall & creek level information; and
- Local knowledge i.e. awareness of a King tide which may trigger some gauges.

When necessary EWN seeks Council clarification of the initial creek flood event before sending alerts to customers. **Typical turnaround time for these alerts is three minutes.** Council has access to the system to view all notifications including times and dates, and subscription information for reporting purposes.

Who can access the system?

EWN partners such as Brisbane, Townsville, state governments and commercial operations are provided a single administrative access to the system. This access enables administrators to view all records relevant to their users (residents, employees or customers) and to create new administrators, alert groups and to generally manage their account including the ability to send notifications and alerts. Where an administrator wishes to send a message they have created (In addition to EWN generated alerts), most of them request EWN to manage the process on their behalf. The system logs the administrator or person sending an alert.

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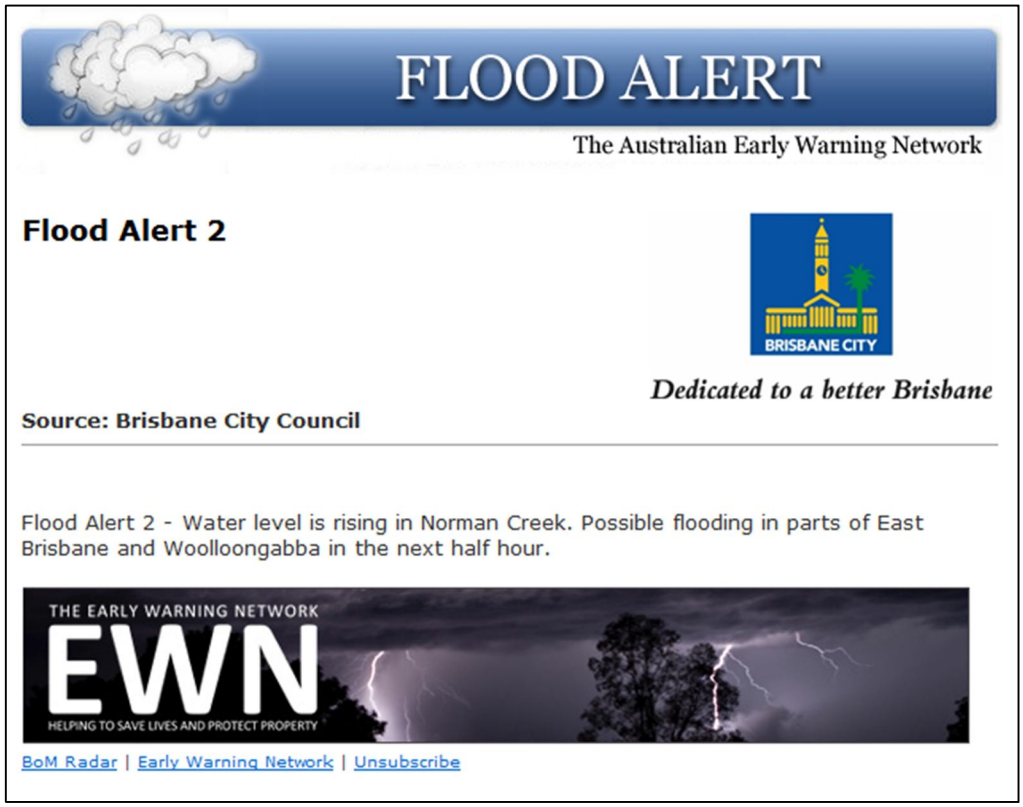
Example of flood alert email; content is the same for SMS and landline messages with the latter repeated twice.



FLOOD ALERT

The Australian Early Warning Network

Flood Alert 2

BRISBANE CITY

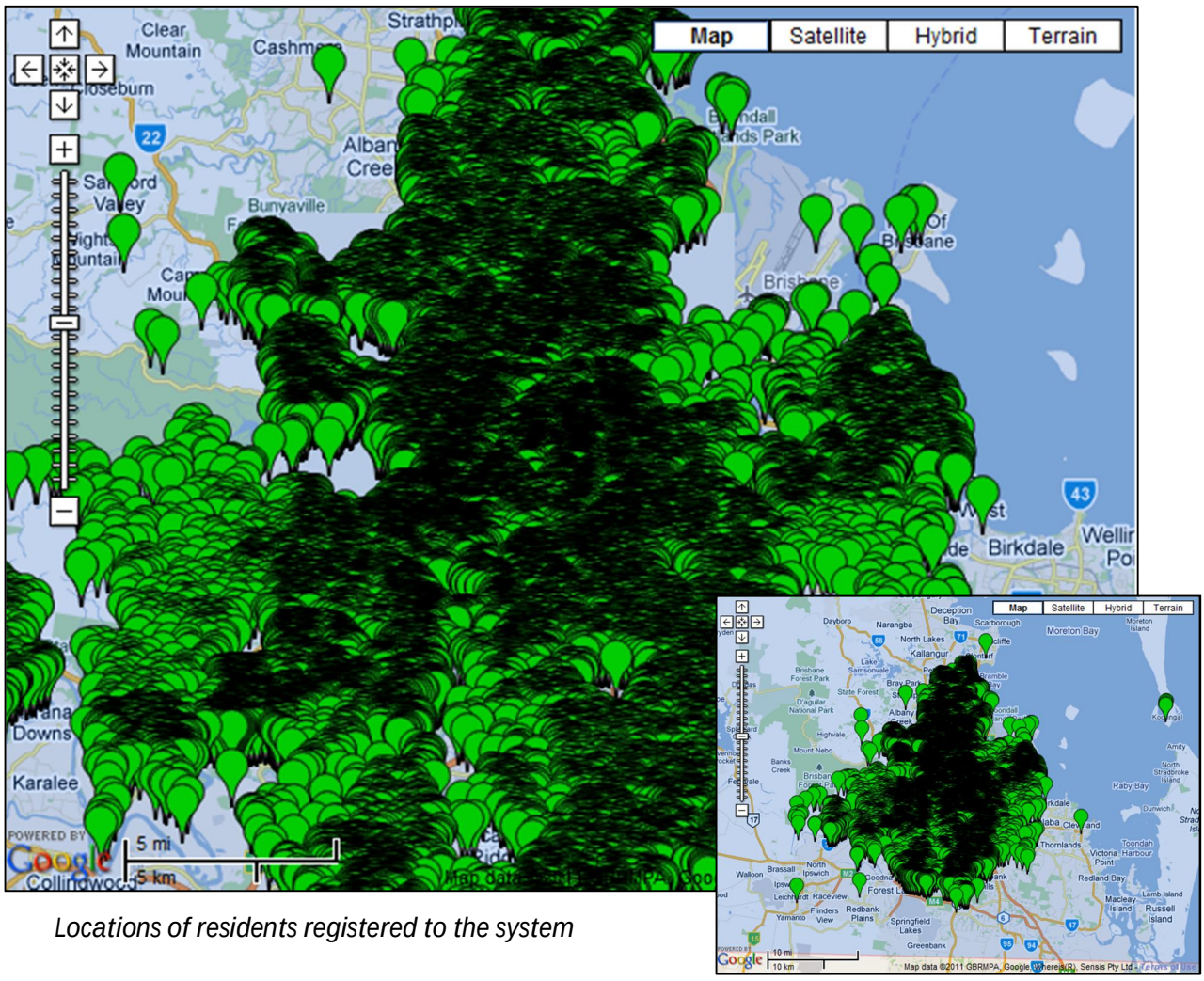
Dedicated to a better Brisbane

Source: Brisbane City Council

Flood Alert 2 - Water level is rising in Norman Creek. Possible flooding in parts of East Brisbane and Woolloongabba in the next half hour.

THE EARLY WARNING NETWORK
EWN
HELPING TO SAVE LIVES AND PROTECT PROPERTY

BoM Radar | Early Warning Network | Unsubscribe

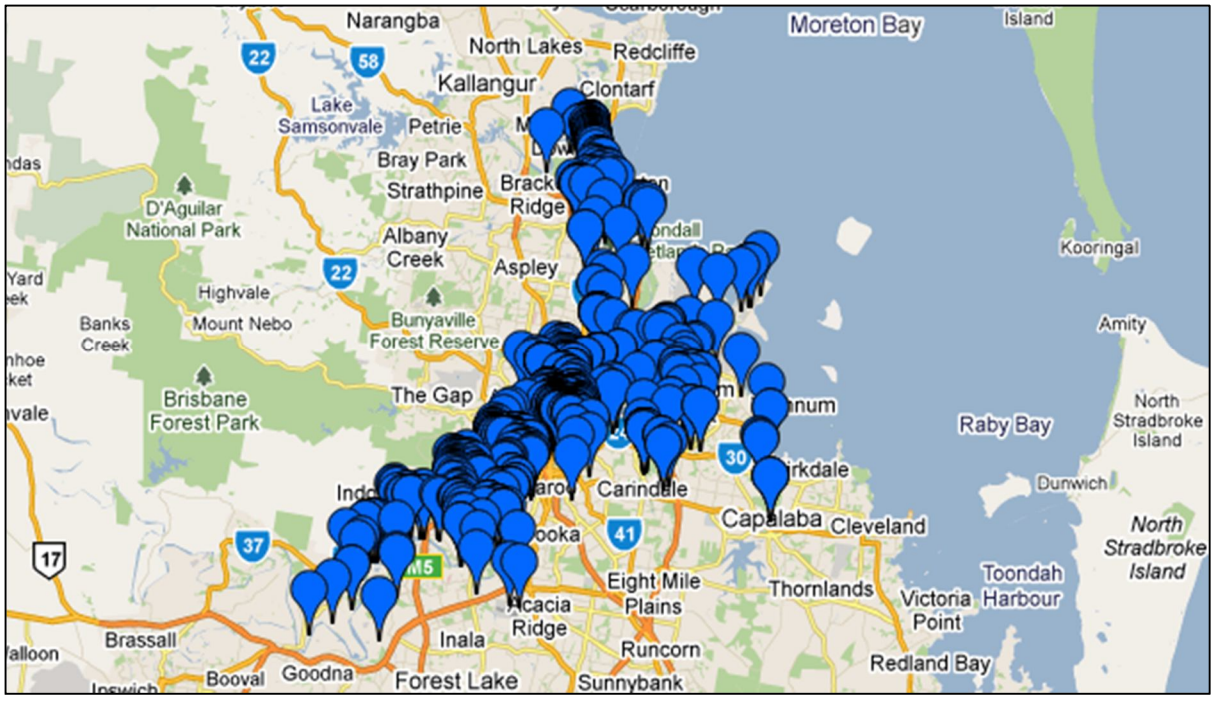


Locations of residents registered to the system

Alert Types

Quick alerts and saved alerts.
A quick alert is used to send messages simultaneously to a list copied and pasted into the system that combines emails, mobile and landline. Saved alerts allows previous polygons that have been created to be re-used and more importantly polygons or shape files to be imported for use in identifying users in specific areas. Good examples are the king tide shape files. Through these the system can extract all registered users with properties located within the 1.6m or 1.8m high tide mark. These can then be issued warnings when combinations of river height and tides combine to threaten property.

Detailed below are registered users located within the 1.8M king tide mark.



Auto Alerts
As previously addressed when discussing creek flood alerting, EWN has developed a process we call Auto Alerts. This process automatically geo-locates an incident and creates an alert area surrounding the location. It then sends alerts to all those registered within the area based on how they have requested to be informed. A description of this process is detailed in **Attachment E.**

Mobile Location Based Alerts
The EWN system provides the ability to send warnings to mobile phones based on their physical locations. The federal government is working to achieve the same for the Emergency Alert system using cell tower broadcasting. A description of the available methodologies is detailed in following Attachments**.**

- END -

Attachment C

Early Warnings You Can Understand

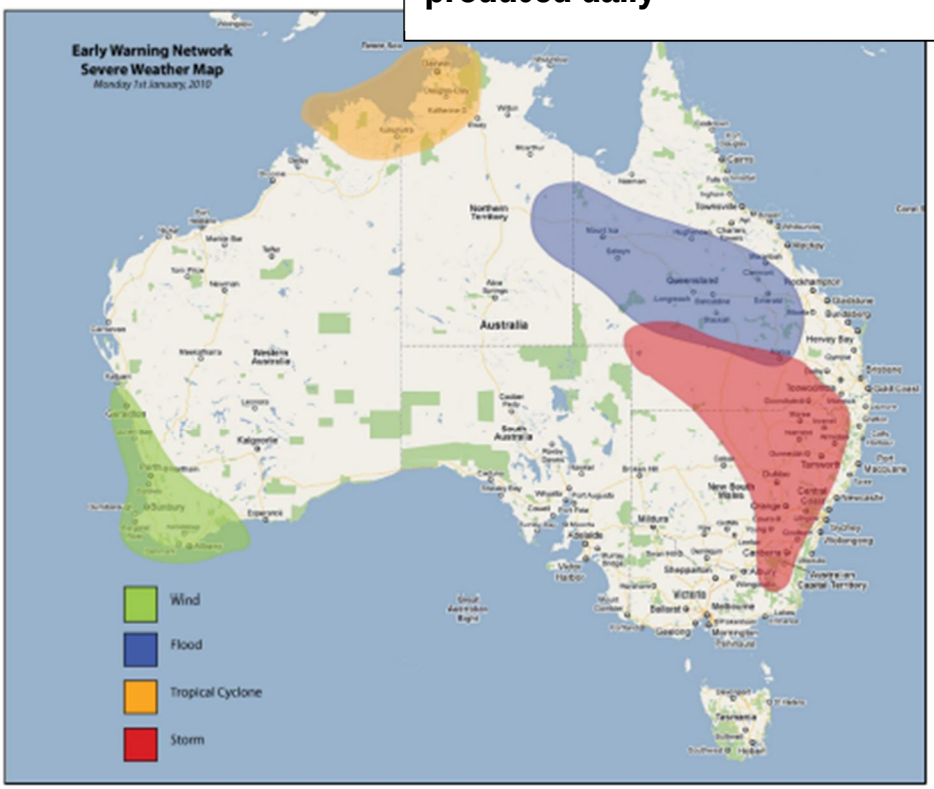
In addition to imminent warnings sent by EWN, the following are also available.

Severe Weather Outlook

Early Warning Network

Monday 1st January 2010

1. A national Severe Weather Outlook is produced daily



Severe Tropical Cyclone Albert (Category 3) is currently located approximately 500km west of Darwin and is moving slowly eastwards. Albert is expected to intensify later tonight into a category four system before possibly making landfall late tomorrow south of Darwin about the Port Keats region. However strong winds and heavy rain are being experienced about the northern WA coastline today and will push into the western areas of the Top End overnight. Moisture is streaming across from this system into Queensland and is combining with an upper level trough to produce further heavy falls of around 50-100mm during the next 24 hours resulting in possible flooding. Meanwhile further south over southern Queensland and over the NSW ranges and slopes, a trough will bring thunderstorm activity and will combine with the unstable upper atmosphere to bring severe storms with large hail, damaging winds and heavy rainfall likely though this should mostly remain west of the NSW coast. In Queensland, cloud cover will impact on storm chances over southeast Queensland.

A high pressure system over the Bight will bring fine and mild weather to most of Victoria and South Australia and push warm to hot conditions into Western Australia. However a cold front will push

2. The Severe Weather and Rainfall Alert is produced for specific locations daily

WEATHER ALERT

THE AUSTRALIAN EARLY WARNING NETWORK

Severe Weather and Rainfall Alert

Issued at 0900, 1st of January, 2011 for Brisbane

Today's Severe Weather Threat is: **High**

Discussion: A trough will bring some late afternoon and evening showers and thunderstorms today across the Brisbane region. Due to the very strong instability there is the high chance of hail and strong winds. Overnight storms will weaken into rain areas with the rain clearing during the early to mid afternoon. A drier change will then bring fine weather for Wednesday and Thursday but some isolated showers and storms could redevelop on Friday but at this stage these are not expected to become severe.

Weather Brief

	Mon 1st	Tue 2nd	Wed 3rd	Thu 4th	Fri 5th
Maximum	33	28	29	30	31
Minimum		23	21	22	23
Brief Forecast	late storm	rain periods clearing later	fine	fine	Chance late shower/storm
Max Rainfall Chance (9am to 9pm)	70%	80%	0%	0%	40%

Chance of Rainfall

	Mon 1st	Tue 2nd	Wed 3rd
0900 - 1200	0%	85%	0%
1200 - 1500	10%	65%	0%
1500 - 1800	70%	15%	0%
1800 - 2100	70%	5%	0%
2100 - 0900	80%	0%	0%
24 hour rain	15-25mm	15-20mm	0mm

Severe Weather Threat - Next 24 hours

	Chance Hail 2cm	Chance wind gust 65km/h	Chance wind gust 90km/h
0900 - 1200	0%	0%	0%
1200 - 1500	10%	10%	5%
1500 - 1800	55%	70%	60%
1800 - 2100	25%	60%	35%
2100 - 0900	10%	15%	5%

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3. Pre alerts are issued to vulnerable locations on days of high threat.

WEATHER ALERT

THE AUSTRALIAN EARLY WARNING NETWORK

Thunderstorm and Rain Threat Advice

BRISBANE CITY

Dedicated to a better Brisbane

THUNDERSTORM/RAIN THREAT ADVICE FOR BRISBANE
Thursday 3 March 2011

An SMS or phone message HAS NOT been issued with this email. An alert via SMS or phone will be issued if appropriate.

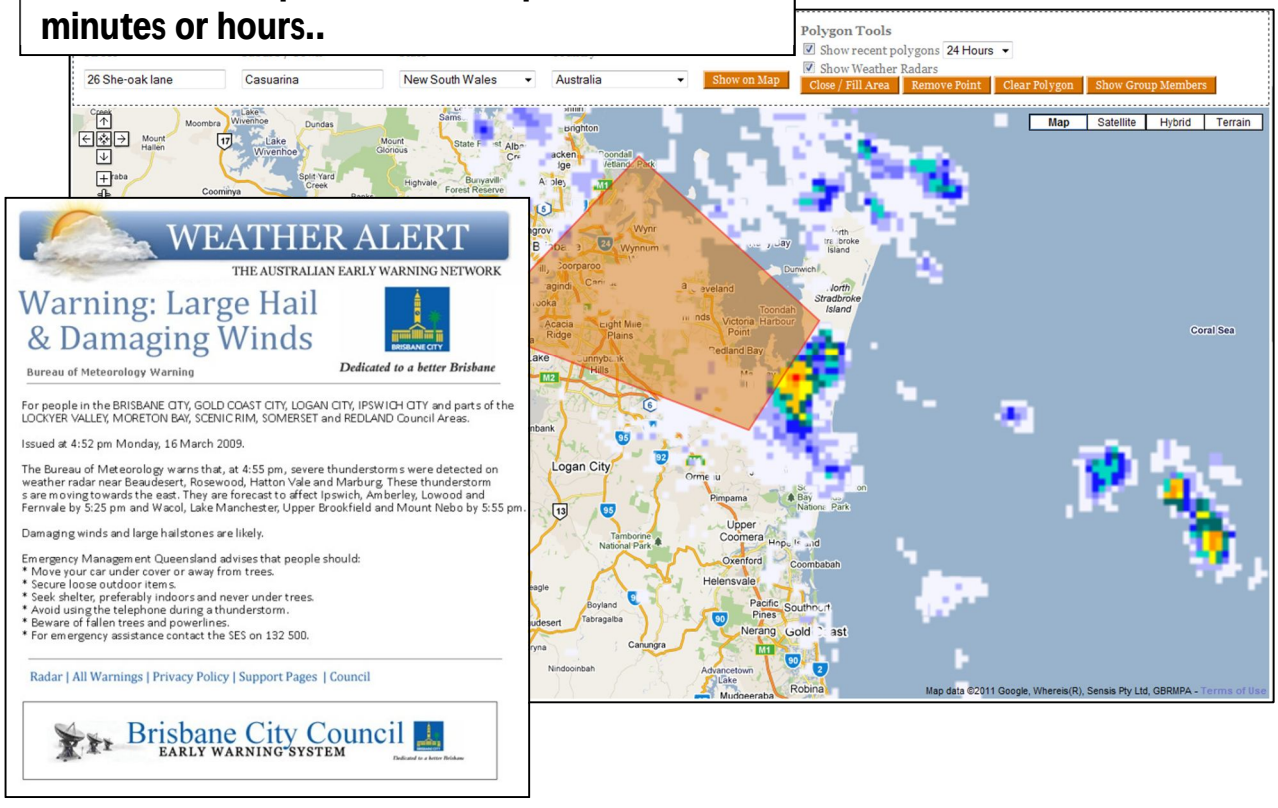
This advice is a heads-up for possible severe thunderstorms later today, this evening and overnight. The main threat is flash flooding though damaging winds are possible in some locations. Areas of rain with some moderate to heavy falls are likely during Friday, persisting until early Saturday.

Recipients are advised to monitor media and the Bureau of Meteorology website.

Brisbane forecast from the BoM issued at 4.50am:
A shower about this morning, increasing in the afternoon with a possible thunderstorm. Light to moderate N/NE winds. Friday: Showers/thunderstorm, late rain

BoM Radar | Early Warning Network | Unsubscribe

4. Warnings are issued over multiple channels for locations expected to be impacted within minutes or hours..



WEATHER ALERT

THE AUSTRALIAN EARLY WARNING NETWORK

Warning: Large Hail & Damaging Winds

BRISBANE CITY

Bureau of Meteorology Warning

Dedicated to a better Brisbane

For people in the BRISBANE CITY, GOLD COAST CITY, LOGAN CITY, IPSWICH CITY and parts of the LOCKYER VALLEY, MORETON BAY, SCENIC RIM, SOMERSET and REDLAND Council Areas.

Issued at 4:52 pm Monday, 16 March 2009.

The Bureau of Meteorology warns that, at 4:55 pm, severe thunderstorms were detected on weather radar near Beaudesert, Rosewood, Hatton Vale and Marburg. These thunderstorms are moving towards the east. They are forecast to affect Ipswich, Amberley, Lowood and Fernvale by 5:25 pm and Wacol, Lake Manchester, Upper Brookfield and Mount Nebo by 5:55 pm.

Damaging winds and large hailstones are likely.

Emergency Management Queensland advises that people should:
* Move your car under cover or away from trees.
* Secure loose outdoor items.
* Seek shelter, preferably indoors and never under trees.
* Avoid using the telephone during a thunderstorm.
* Beware of fallen trees and powerlines.
* For emergency assistance contact the SES on 132 500.

Radar | All Warnings | Privacy Policy | Support Pages | Council

Brisbane City Council
EARLY WARNING SYSTEM

Attachment D

Case Study, EWN in Action – Melbourne Hail Storms

Executive Summary

On 6 March 2010 EWN issued a series of warnings to locations in and around Melbourne about to be impacted by severe thunderstorms packing hail, flash flooding and damaging winds. Warnings were sent to Mobile (text), email and desktopALERT. This report analyses and explains the process, details feedback from recipients and demonstrates the substantial success of the system to save property during this event.

It is quite clear these warnings and the system saved people (and insurance companies) from considerable loss during this hail event.

Detailed in this report is just some of the feed back we received from members describing their experience during the Melbourne hail event. We have a lot more feedback which reveals the behavior of those receiving warnings…and those who did not. Evident is that:

1. Many people were entirely unaware of the approaching storm or its nature
2. EWN members took heed of our warnings and successfully acted to protect property
3. Many more people other than EWN members were alerted as a result
4. Significantly more property could have been protected if assistance were provided to EWN

Feedback also confirms previous survey results which show some 97% of members take action to protect property, 83% log on to the BOM website to continue to monitor the event and 92% tell others. These numbers seem high but are probably not surprising given they are from a population who have been proactive in joining EWN to do just that. It should be noted, that taking action may include further monitoring or information discovery.

As commented previously, EWN protected far more than just its members. It is not unusual for one warning to be distributed to hundreds of others. (*I have received back emails that have done the rounds with hundreds on the distribution list*)

THE EARLY WARNING NETWORK

Why does this matter? EWN is the only location based delivery system for severe weather in the world. Over three years of experience and technology development have produced a unique IP that is proven and highly effective in the protection of property. This is an initiative of global significance that improves the safety of people, protects property and helps make the community a safer place to live.

Melbourne Hail Storm

Melbourne Hailstorm Warning

WEATHER ALERT

THE AUSTRALIAN EARLY WARNING NETWORK

VIC Severe Thunderstorm Warning: Large Hail, Flash Flooding, Damaging Winds

Metcash

EWN FOUNDATION SPONSOR

Source: Bureau of Meteorology

For people in the Inner, Western, Geelong and Bellarine Peninsula, Port Phillip and parts of the South East, Eastern, Northern and Mornington Peninsula Local Warning Areas.

Issued at 2:02 pm Saturday, 6 March 2010.

The Bureau of Meteorology warns that, at 1:55 pm, very dangerous thunderstorms were detected on weather radar near Gisborne and Melton. These thunderstorms are moving towards the southeast. Very dangerous thunderstorms are forecast to affect Footscray, St Albans, Sunbury and Werribee by 2:25 pm and Caulfield, Craigieburn, Glen Waverley, Greensborough, Melbourne City and Preston by 2:55 pm.

Damaging winds, very heavy rainfall, flash flooding and large hailstones are likely.

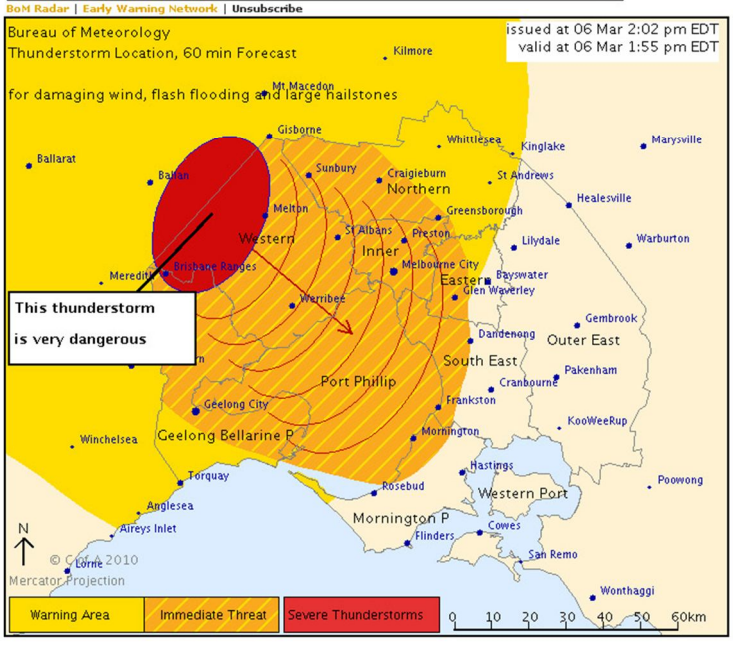
The State Emergency Service advises that people should:
* Keep clear of fallen power lines.
* secure any loose objects in the vicinity of your home.
* keep away from creeks and drains.
* do not drive vehicles through flooded areas.
* stay indoors if possible.
* Avoid using the phone during the storm.
* if you are outside, avoid sheltering under trees
* listen to the radio for storm updates
* switch off your computer and electrical appliances

Metcash

Emergency Pantry List
Ensuring the supply of critical foods and essential items for Australian conditions

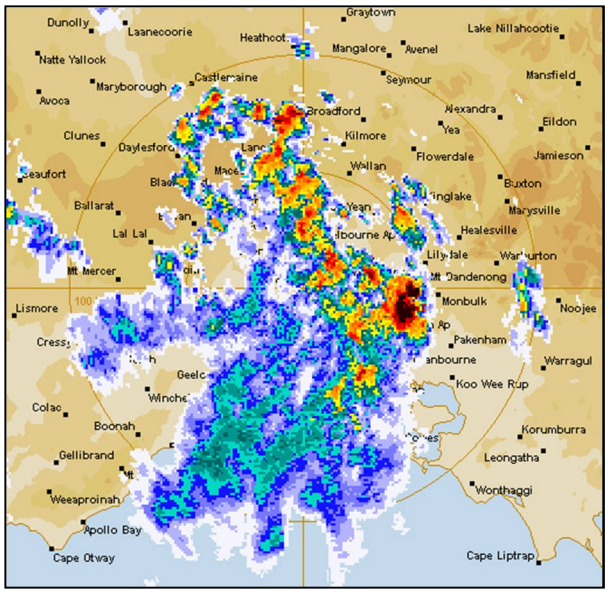
BoM Radar | Early Warning Network | Unsubscribe

SMS Message sent to mobile



Introduction

EWN internal forecasting for Saturday 6 March 2010 was for severe weather. At 10:13AM EWN began to provide specific and geo targeted warnings to those populations that were going to be impacted by rapidly developing severe weather. This began in the middle and upper west of the state and by the end of the day had progressed across the greater proportion of Victoria.

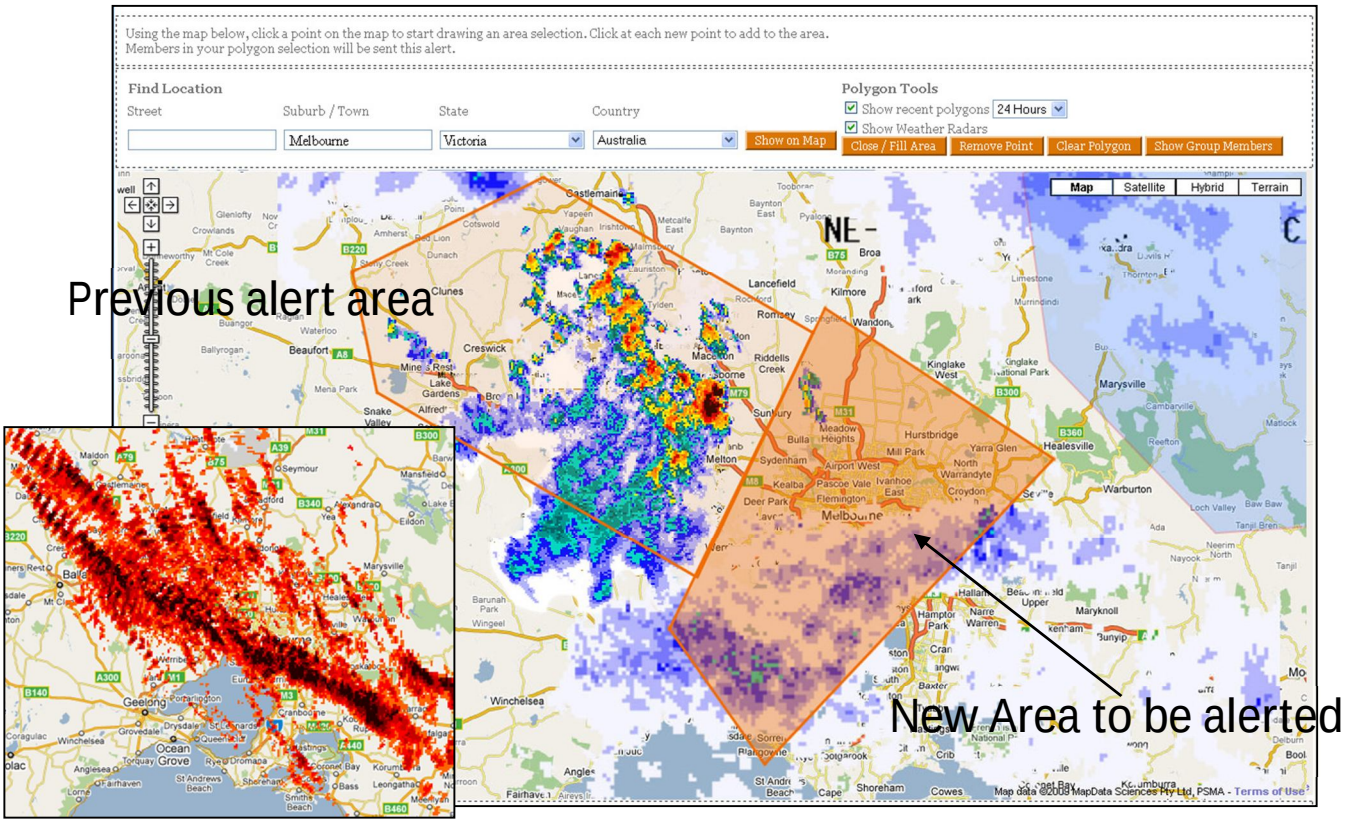


The following pages break down EWN's warning process on that day illustrated by GNIS* system reports of the areas targeted with each warning.

EWN has provided early warning to its members for every severe weather event experienced in Australia since September 2007, including targeted alerts on Black Saturday.

An example of the email warning can be viewed here:
https://www.ewn.com.au/media/melbourne_hailstorm.aspx
The radar loop for the entire event can be viewed here:
http://www.theweatherchaser.com/radar-loop/IDR023-melbourne/2010-03-06-00/2010-03-06-12

To assist the reader in understanding how EWN tracks and provides warning, the screen grab below illustrates how weather radar is overlaid on EWN's mapping system along with previous alerts already delivered. This provides track history and allows projection of impact areas. The system is accurate to within ten metres.

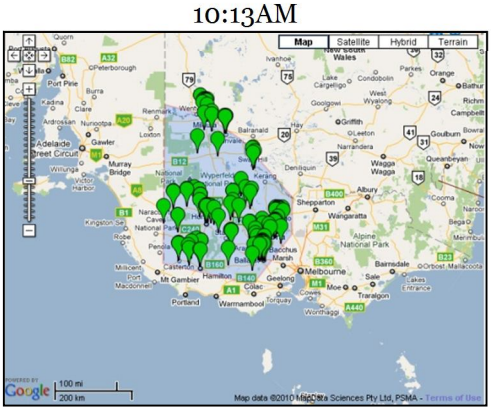


*GNIS Geographical notification and Information System

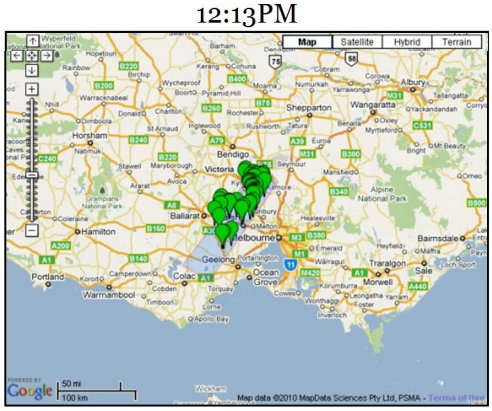
THE EARLY WARNING NETWORK

The following maps are delivery reports from Saturday March 6 2010. Icons below represent members of a specific group (Not all members). This is only a small part of the delivery report. Due to privacy reasons we are unable to show the full report.

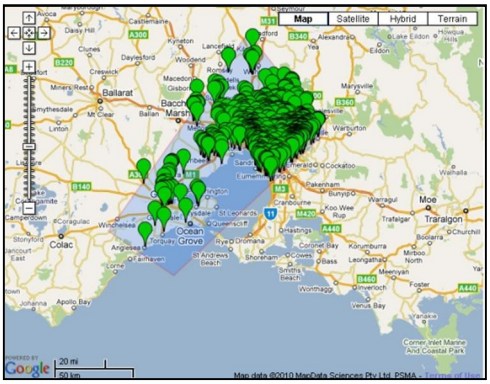
10:13AM



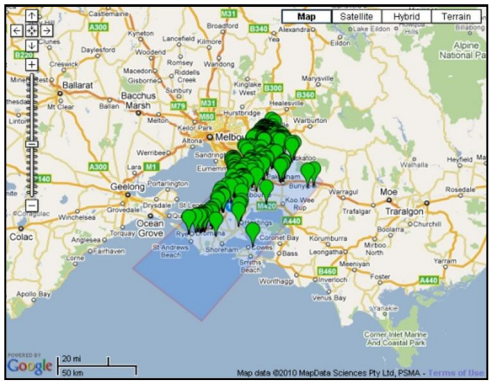
12:13PM



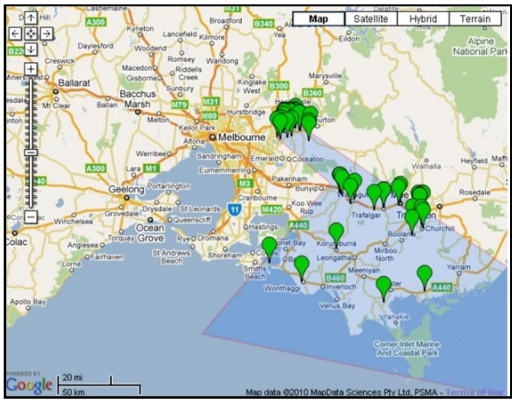
12:47PM



2:11PM



2:57PM



3:36PM

3:56PM

Conclusion

It is quite clear the system saved people (and insurance companies) from considerable loss during the March 6 Melbourne hail event.

Detailed in this report (http://www1.ewn.com.au/media/melbourne_hail_storm_report.pdf) is some of the feedback we have received for the Melbourne hail event.. We have a lot more feedback which reveals the behaviour of those receiving warnings...and those who did not. Evident is that:

1. Many people were either entirely unaware of the approaching storm or its nature
2. EWN members took heed of our warnings and successfully acted to protect property
3. Many more people other than EWN members were alerted as a result
4. Significantly more property could have been protected if assistance were provided to EWN

Borne out by this feedback is confirmation from previous survey results that in addition to taking action to protect property, recipients (83%) when they are able to log on to BOM website to continue to monitor the event and 92% tell others. It is is not unusual for one warning to be distributed to hundreds of others. (*I have received back emails that have done the rounds with hundreds on the distribution list*)

EWN is the only location based delivery system for severe weather in the world. Over three years of experience and technology development have produced a unique IP that is proven and highly effective in the protection of property.

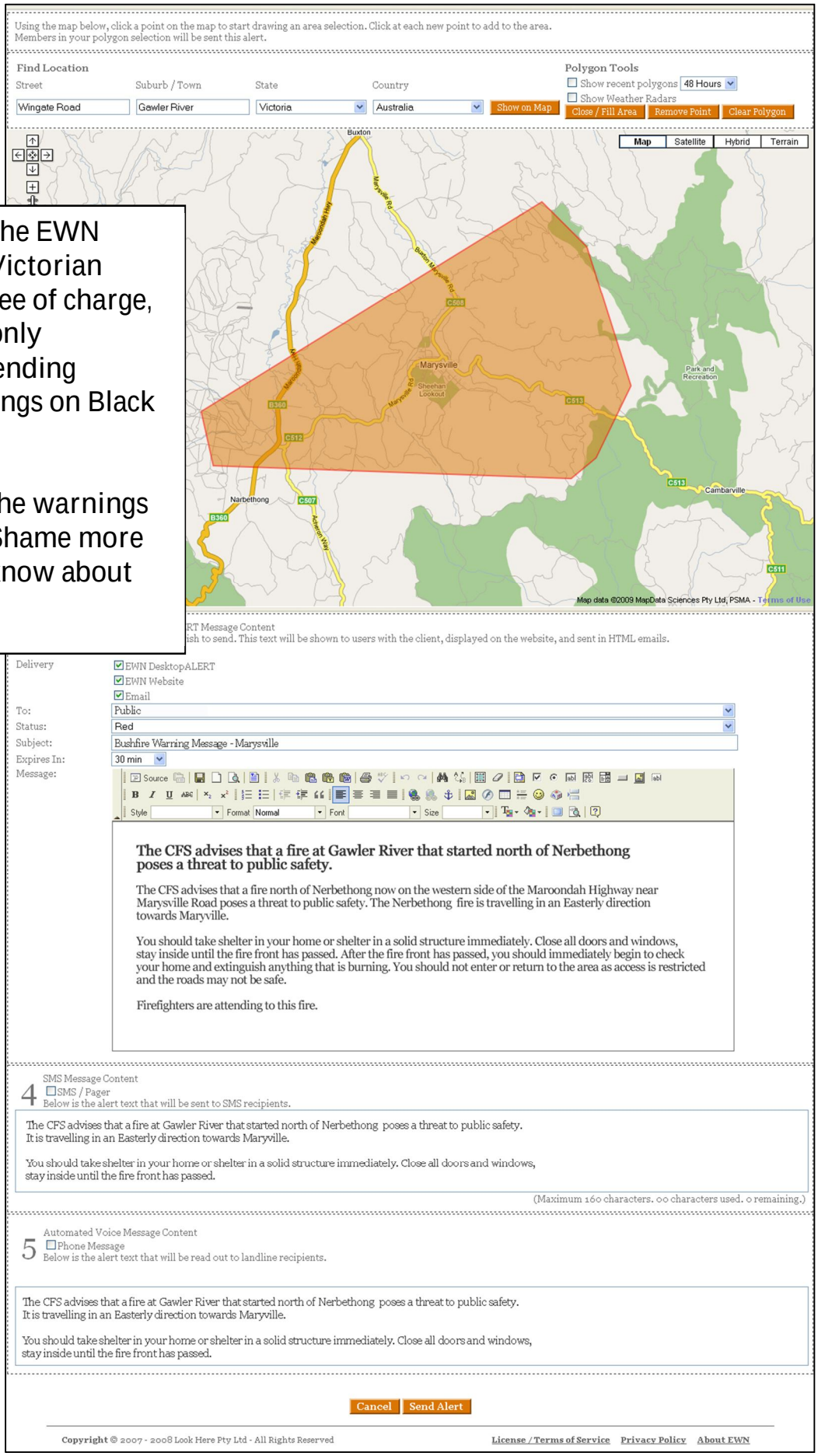
"EWN has provided early warning to its members for every severe weather event experienced in Australia since September 2007, including targeted alerts on Black Saturday."

This is one example of many. For more such reports please contact the author Kerry Plowright at the address provided or kerry@ewn.com.au on mobile 0403147197

Insert – alert sent from system on Black Saturday

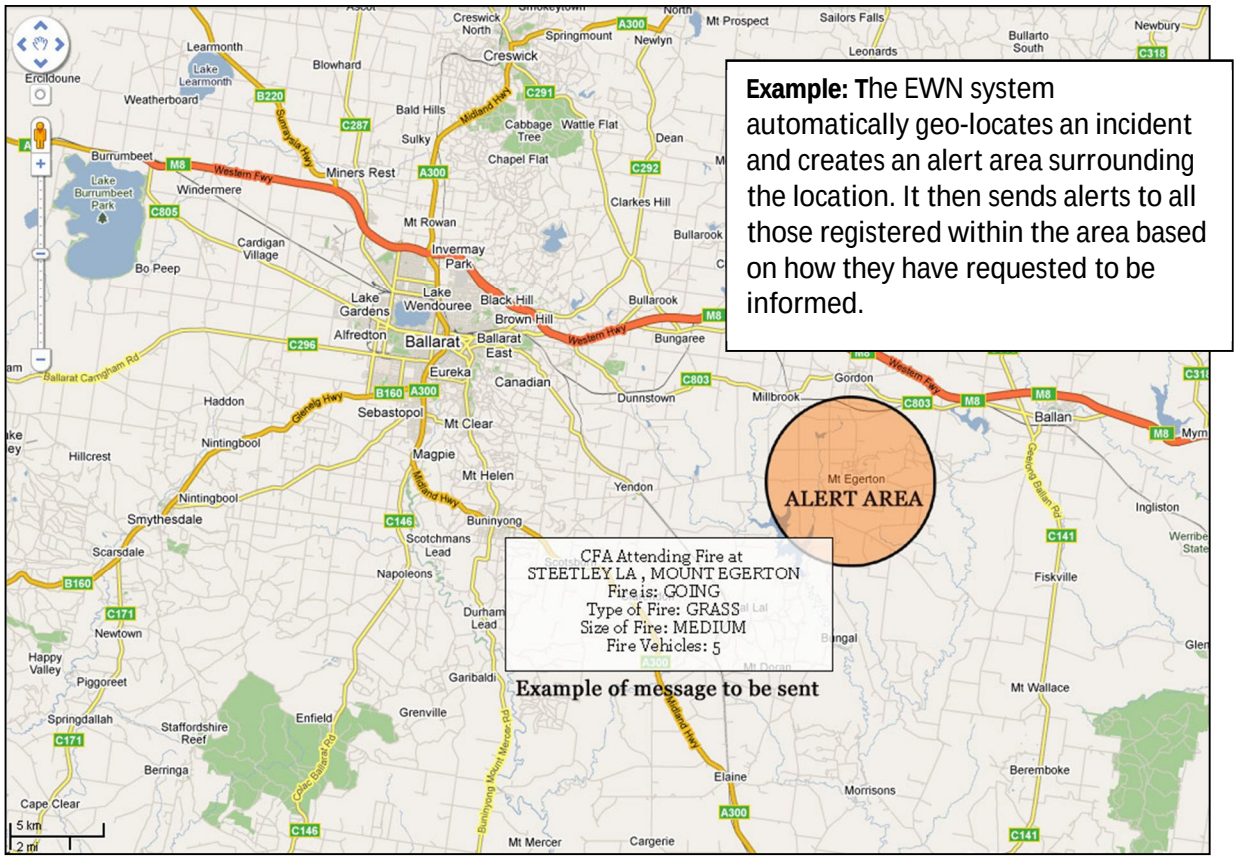
After offering the EWN system to the Victorian Government free of charge, EWN was the only organisation sending targeted warnings on Black Saturday.

This is one of the warnings sent that day. Shame more people didn't know about it……

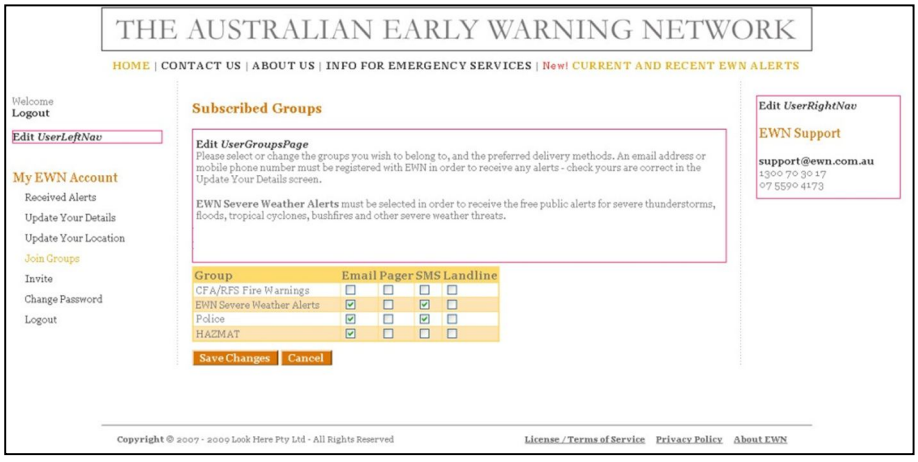


Attachment E

Automated CFA/RFS and Police Alerts - How it Works



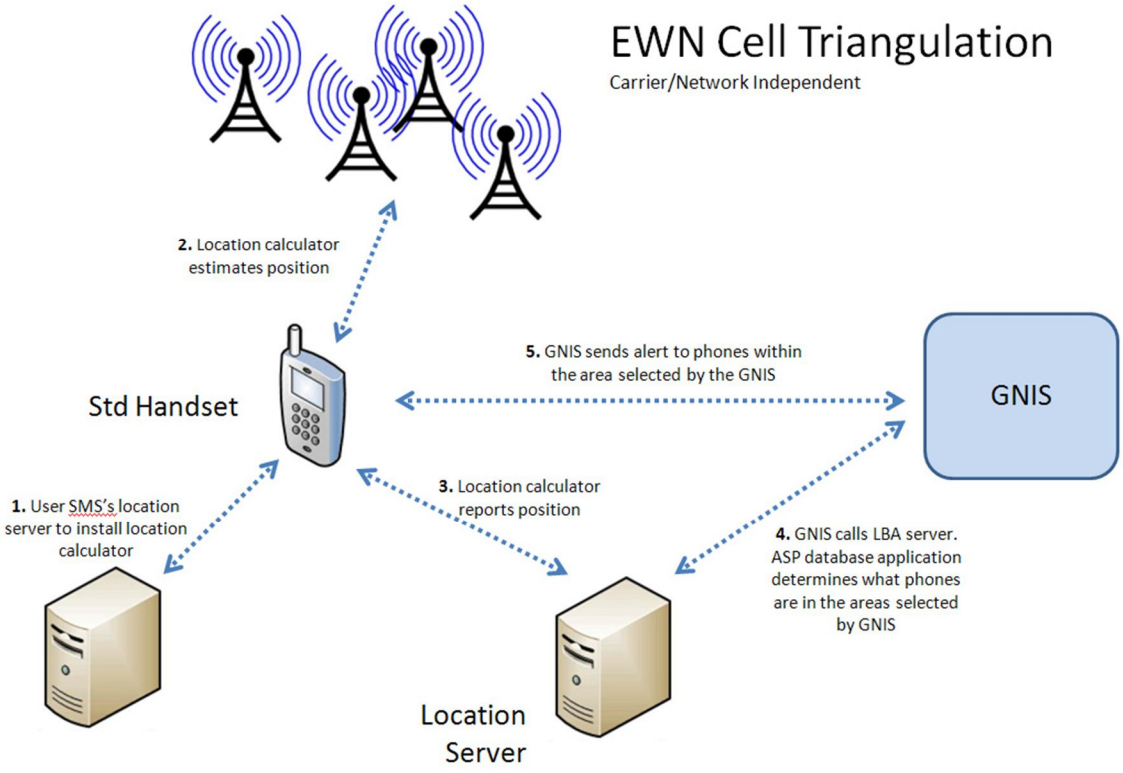
In addition to EWN's severe weather alerts, EWN has developed a series of automated alert systems for fire and other emergencies. Anyone registered for EWN severe weather alerts can also select to receive these as well. Members simply login, click on 'Join Group' and then select which alerts they wish to receive and how. Members can go back at any time and change these settings.



The system is designed to automatically send alerts to those who live close to where any fire starts. The system geo-locates the incident or fire and sends an SMS and email notification to all those registered to the system within 3km.

Anyone who lives or is located near an incident would know about a fire before it becomse a catastrophic event. People will know the moment a fire started and can monitor it, preparing well in advance. Likewise if people see smoke on the horizon or nearby they won't want be hassling emergency numbers or operators. The alerts are created in real time as the CFA, RFS or selected authority issues them.

LOCATION BASED SEVERE WEATHER AND EMERGENCY EARLY WARNING SYSTEM



General Description EWN Mobile LBA

Cell Triangulation

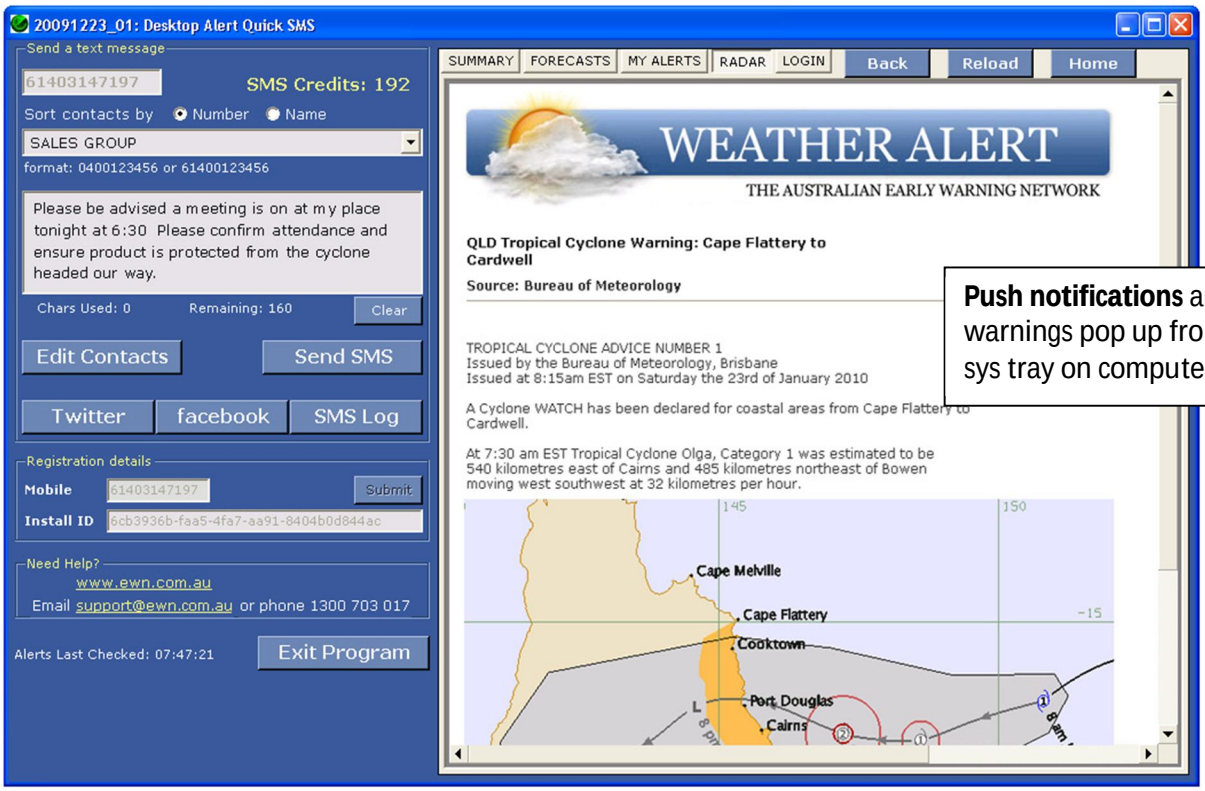
Forecasting and alerting the public for severe weather events and other emergencies is not new. Alerts however are not accurate or delivered to just those that need it when they need it. This invention has been specially devised and developed to enable extremely accurate mapping and delivery of severe weather alerts and information to mobile phones based on their physical location at the time. This reduces the accuracy of alerts from many kilometers to within just metres and works for over 90% of all handsets.

The system that supports this capability is called a Geographic notification and Information System (GNIS). The uses a digital map to select geographic area/s to send a message or 'alert' to ALL or selected mobile phones within the areas drawn. The map used to select these areas is called the 'Alert Map'. The Alert Map is used to accurately select an area or areas, to input the alert contents and to send the alert.

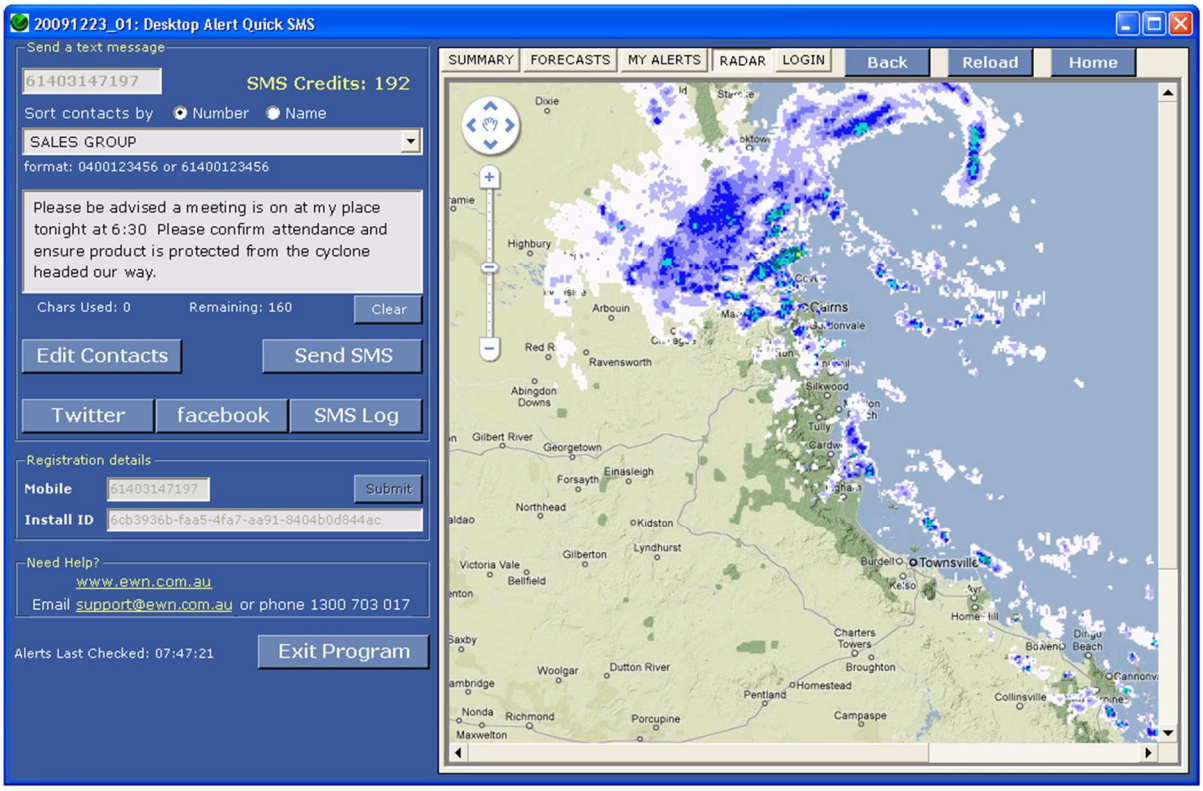
Smart Phones
EWN can alert smart phones based on their physical location via the EWN mobile application.

Attachment G

DesktopAlert



Push notifications and warnings pop up from the sys tray on computers



Early Warning for Business

Description of products provided to business

Severe Weather and Incident Manager (SWIM)

EWN's Severe Weather and Incident Manager aims to improve the safety of personnel and to protect property and business operations.

The Severe Weather and Incident Manager (SWIM) is an online application and solution developed for business operations who wish to register and manage multiple locations and contacts. SWIM allows a business to manage and add/edit locations, who receives alerts, how they get them, the method and the alert types they receive. In addition to this the system provides substantial reporting and records of all events and communication history.

AllAlerts

AllAlerts allow a business to set up contacts to receive all EWN alerts for any region, state or nationally. These are delivered via SMS and email, and/or fax if required.

Customized Forecasting

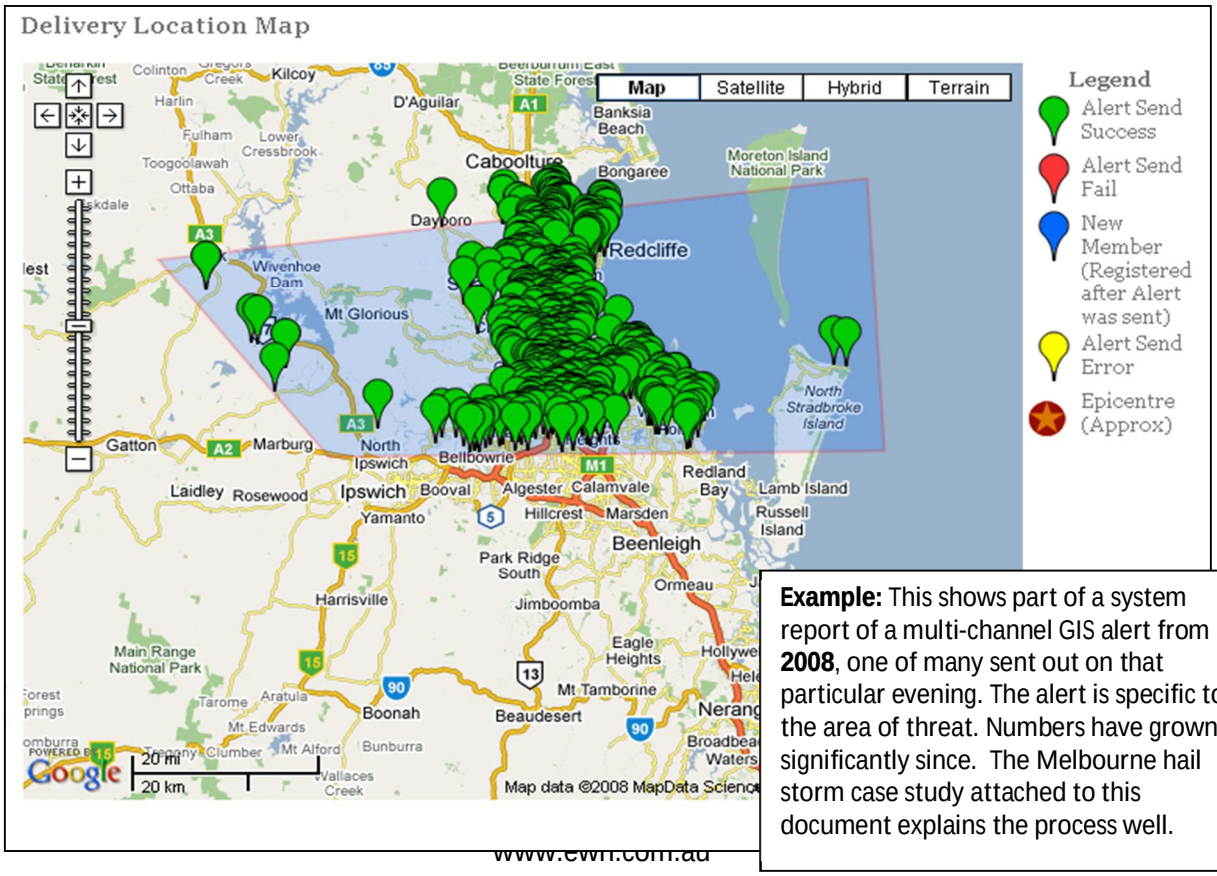
EWN provides additional location based alert services to assist with critical planning decisions for business. Delivered by email, SMS or fax they include rainfall probabilities, severe weather forecasting, wind strength alerts and custom forecasts. These are widely used in the manufacturing, construction, resources and energy sector.

Attachment I

Going Viral – How EWN Got Started

Barry and Lance toasting success.....

Our story began with people like Barry and Lance enjoying a beer and sharing yarns. In this instance Barry telling his mate how his $200K Porsche and expensive solar panels were just saved from hail stone damage along with his prized thoroughbred and pet dog who would have been pummelled in the back yard when the storm hit. Instead, cars were garaged, kids picked up early and home safe, dog inside, horse stabled and solar panel covered.



Example: This shows part of a system report of a multi-channel GIS alert from **2008**, one of many sent out on that particular evening. The alert is specific to the area of threat. Numbers have grown significantly since. The Melbourne hail storm case study attached to this document explains the process well.