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Based within the Social Science team at GNS Science, Wendy specialises in land use planning for natural hazard risk reduction and is currently completing a PhD in the same area. Wendy has also been involved in the publication of landslide guidelines for consent and policy planners; with colleagues developed a pre-event recovery methodology for land use planning; and is interested in the role of urban design in natural hazard risk reduction.

## Julia Becker

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Julia is a social science researcher at GNS Science. Currently she is involved with research into enhancing community resilience and effective planning and policy for natural hazards in New Zealand.

Good afternoon. We would like acknowledge David Johnston of GNS and Douglas Paton from the University of Tasmania who were also involved in the research we are presenting today.

## 1 Introduction

We developed a postal survey which was based on previous surveys that we've undertaken following earthquakes, such as the Te Anau earthquake, and post-flood surveys. These surveys are quite similar so that comparisons can be made.

The aims of our post-earthquake household damage and preparedness survey were to:

- » develop an understanding of the impacts of the earthquake on residents;
- » estimate damage and losses (insured and uninsured);
- » estimate awareness of the earthquake hazard; and,
- » estimate preparedness for earthquakes.

We did a letter drop in February 2009 around a couple of communities within Gisborne. One thousand households were randomly selected from census meshblocks and we delivered it to a mix of households; some that were at risk from tsunami as well as some who were not, just to see how people responded about or around the tsunami threat. We did an initial survey drop around the households and then we posted a follow-up letter with a copy of the survey, between 2 to 4 weeks later, to prompt people who had not responded yet. We had 308 questionnaires returned, which was a response rate of about 31%.

We have grouped the key findings into four themes. The first being property damage, followed by insurance issues, how people responded to the tsunami threat, and pre- and post- earthquake preparedness.

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## 2 Property Damage

Property damage was reported by 70% of the households surveyed, keeping in mind that we only surveyed residential houses and did not look at the commercial aspect of this. Most of the damage was only minor and that is reflected in our results:

- » 51% had only few items broken; 20% many items;
- » 24% experienced a minor shift in large appliances like big refrigerators and freezers;
- » 97% had no damage to hot water cylinders (we don't have a handle on how many of those were hot water cylinders versus the new gas hot water systems);
- » 22% reported cracks in chimneys; 4% said they experienced more damage to chimneys than just cracks;
- » 11% found that elevated water tanks had moved or leaked; and,
- » 40% experienced hairline cracks in exterior walls; 5% of these being large cracks.

People recovered quickly from this event, with 60% of respondents reporting that they had no delay in returning to normal. Of the 40% who did take time to return to normal, again it was a very quick recovery time:

- » 47% one day;
- » 27% two days;
- » 19% three-seven days; and,
- » 7% seven-30 days.

## 3 Insurance Issues

We asked questions about insurance issues and found the following:

- » 88% had house insurance and 89% had contents insurance, which might be a reflection of rentals versus straight out home ownership;
- » 47% settled claims with the EQC and 92% of these thought their claims had been settled in a fair way;
- » 22% settled claims with private insurance companies, and again 92% of those thought that their claims had been settled in a fair way; and,
- » 21% reported insurance rates had increased since the earthquake event, however no one reported having difficulty getting insurance post event. We are not actually sure if insurance companies have raised their rates since the event and if they have, it just might be normal rate rises that have occurred.

## 4 The Tsunami Threat

To give you a bit of background to the tsunami threat for Gisborne, there is a threat from tsunami from both local and distant source events. The diagrams in Figure 1 show how vulnerable Gisborne is from all tsunami sources.

The photograph in Figure 2 was taken in 1947 at Wainui beach following a tsunami event. It is fortunate that there was a healthy dune system present because the dunes took the impact of the tsunami, and the houses in behind there were relatively unscathed.

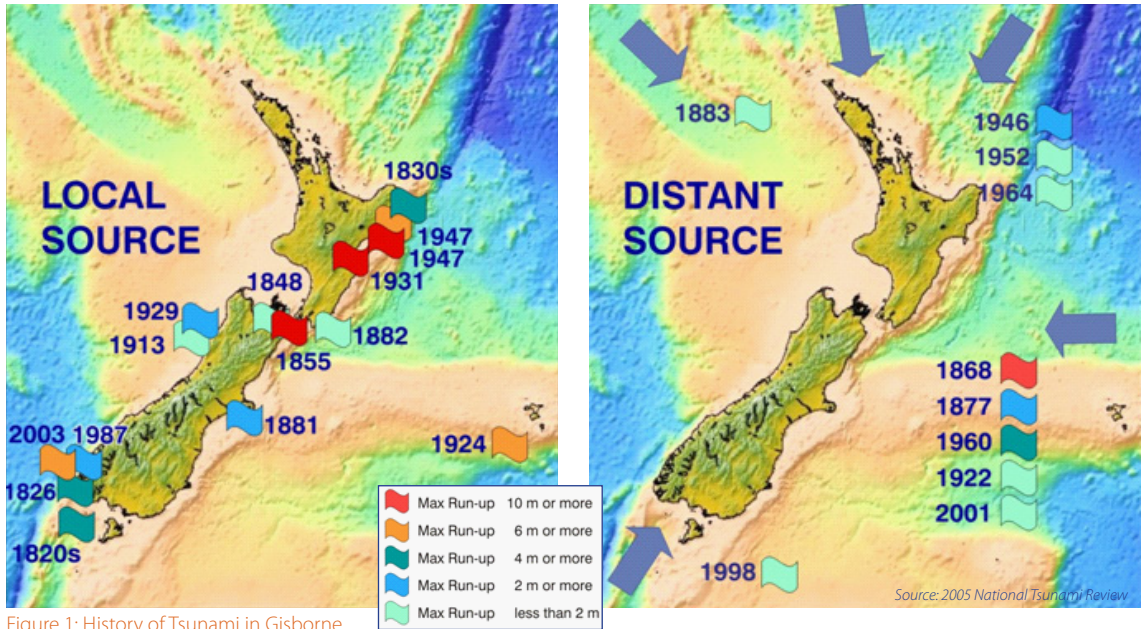


Figure 1: History of Tsunami in Gisborne



Figure 2: 1947 Tsunami Impacts, Wainui Beach

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The Gisborne earthquake did not produce a tsunami, but it is important to note people's behaviour immediately following the earthquake:

- » 11% considered the tsunami risk and evacuated to higher ground;
- » 40% considered the tsunami risk but did not evacuate; and,
- » 33% did not consider the tsunami risk or consider evacuating.

## 5 Community Preparedness

As Alan pointed out in his talk earlier today, when we are considering recovery it is important to think about the other three of those four Rs (reduction, readiness, and response) and how we were going to get our community more prepared for the next event. We looked at this concept of community preparedness in our survey. Some of the questions related to whether people had prepared specific items for a disaster, including things like food and water. We also asked questions about how prepared people thought their communities were and whether their communities had plans in place for disasters or for responding to an event.

When we asked people whether they had participated in their community in any way with respect to disasters or preparing for disasters, only low numbers indicated that they did. This low participation rate is typical of other settlements around New Zealand as most communities that we've surveyed have reported low levels of community participation in disaster-related activities. This is something that needs addressing in terms of getting people involved and getting people prepared in the future.

We also asked people if they had a community response plan or a neighbourhood response plan, and the majority of people (45%) that were asked in Gisborne said that they didn't think their community had one or they didn't know if there was one available in their community (48%). In terms of attendance at meetings on earthquake preparedness, only 14% reported that they had attended some kind of meeting on earthquake preparedness or disaster preparedness.

In terms of household preparedness, we asked people if they had participated in specific actions to prepare for disasters and these are shown in Table 1. Some of these activities are what we would consider quite complex activities: you actually have to go out and do something about fixing your furniture to the wall or fixing your hot water tank. The last three items in the table are simpler activities and more people had actually done these things or had these items available.

One of the important things arising from these figures is that people don't often do things unless they are prompted to by some incident or some activity. And you can see quite obviously that the earthquake in Gisborne, which was quite a moderate earthquake, prompted them to actually go out and prepare. We really need to think about using some of these smaller events to harness people's experience and to use this to build preparedness. Once people have experienced an event they can see some of the impacts that such an event might have, and with this kind of experience in mind they are more receptive to doing something to prepare for future events. And this is also the same if they see something on television, for example, a disaster locally, or a disaster in New Zealand, it comes to the forefront of their mind, they start thinking about it and talking about it. We need to use some of these types of things to get people in a state where they actually want to prepare. We need to think about some of the things that will encourage us to prepare, or motivate us to prepare, and research is being undertaken by several of our colleagues at GNS Science, looking at what needs to be in place for people to prepare. What are the personal attributes that people need? What are the community attributes that communities need? And what needs to be present in terms of institutional support to get people out there preparing for disasters?

Preparation activity	Those that participated in the activity	Of these, those that did so post-earthquake
Tall furniture fastened to the walls	42%	29%
Hot water cylinders fastened	46%	10%
Moveable objects (e.g. TV's, computers) secured	30%	10%
Torches available	81%	23%
Radio available	66%	23%
Adequate water available (three litres of water per person for three days)	52%	18%

Table 1: Respondents that Participated in Preparation Activities

The diagram in Figure 3 shows the kind of attributes or indicators that stimulate people to prepare for disaster events. We have broken these indicators into three areas: personal indicators, community indicators, and institutional indicators.

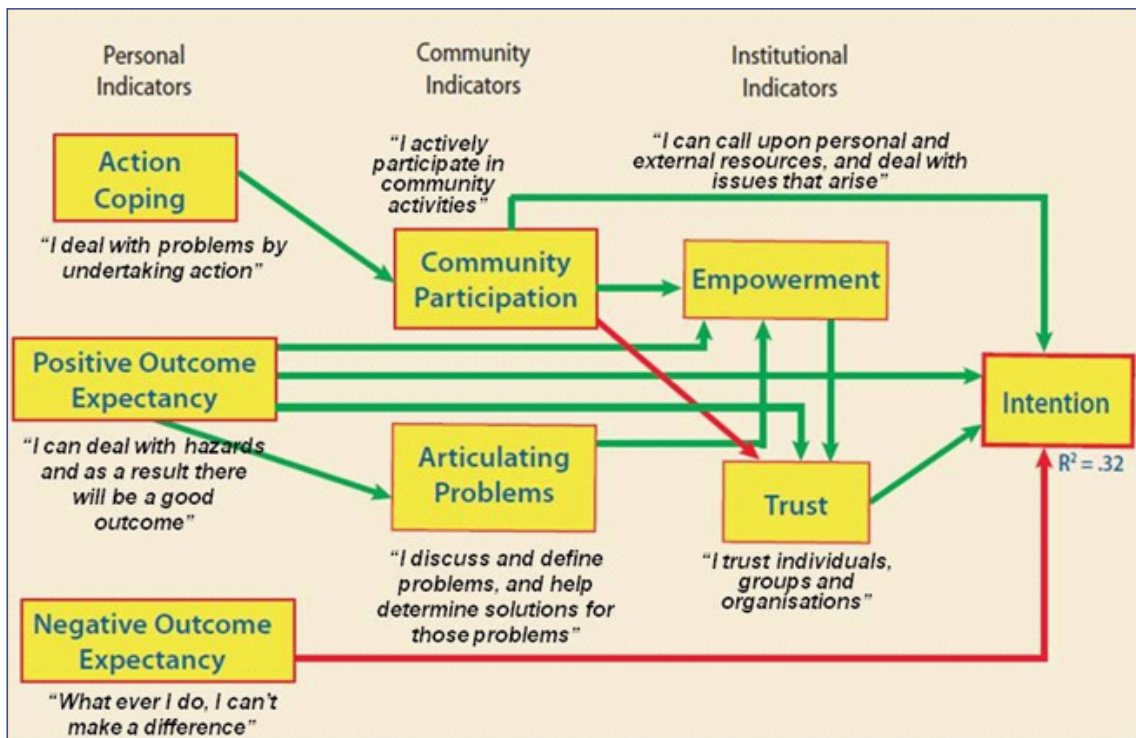


Figure 3: Model for Community Resilience (From Paton, 2006)

### 5.1 Personal Indicators

**Action coping** is people's ability to go away and deal with their problems by undertaking actions. So rather than worrying about a problem they actually go and do something about it, like storing some water. This relates to the statement "I deal with problems by undertaking action".

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**Outcome expectancy** is how beneficial people think the outcome will be if they do or do not prepare for a disaster. We need people to have a **positive outcome expectancy** which is the idea that people think preparing will result in a good outcome; they're going to perhaps survive a disaster as a result. This relates to the statement "I can deal with hazards and as a result there will be a good outcome". And the opposite of that is **negative outcome expectancy**, which is the idea that "whatever I do, I can't make a difference". And so you've got to squash that concept as well.

## 5.2 Community Indicators

**Community participation** is really important. There are a lot of studies that show the more that community members participate in their community, whether it be in a hazards context or whether it be in just a general good community participation context, then they're more likely to be resilient and to want to prepare for disasters. It's this idea of "I actively participate in community activities" and there is a need to build that up in people's communities.

**Articulating problems** is about people and communities being able to talk about the problems that they have in their communities and help determine solutions for those problems. For example, if we have a problem with tsunami in our community, what are we going to do about it? What kind of things do we need to put in place as a community to deal with that threat so that there is not such a tsunami issue here? This relates to the statement "I discuss and define problems, and help determine solutions for those problems".

## 5.3 Institutional Indicators

**Empowerment** relates to people's belief that they can call upon resources – either personal or external – to deal with any issues that arise. Part of that is knowing that they can go to their local council or to another institution that will help them to solve those problems. This relates to the statement "I can call upon personal and external resources, and deal with issues that arise".

People need to have **trust** in institutions in order to work with them to solve some of their hazard-related problems. Interestingly, if you look at the survey results for Gisborne, we asked some questions around trust and we were pleasantly surprised to find that levels of trust were high in Gisborne. In fact, about 70% of the people felt that they trusted their local institutions or their councils. This relates to the statement "I trust individuals, groups and organisations".

In order to increase community preparedness, we need to address the indicators at all three levels:

1. At the personal level, we need to develop:
  - people's problem-solving skills (action coping);
  - their belief in the benefits of hazard mitigation (outcome expectancy); and,
  - their ability to confront hazards (reduce negative outcome expectancy).
2. At a community level, we need to:
  - encourage active involvement in community affairs (community participation); and,
  - develop community ability to resolve collective issues (articulating problems).
3. At the institutional level, we need to:
  - develop an individual's ability to influence what happens in their community (empowerment); and,

- 
- improve the level of trust they have in organisations (trust).

## 6 Summary

Our results indicate that:

- » The Gisborne earthquake caused widespread damage, but this was mostly minor;
- » There were high levels of satisfaction with insurance claims (both private and EQC);
- » There are high rates of general preparedness, like water, torches, and radios – some of which were stimulated by the event;
- » There are lower rates of more complicated preparedness actions, and there is a need to continue to work with communities to raise preparedness; and,
- » There are low levels of collective community engagement around earthquake preparedness.

These are just preliminary results from this survey. We will be undertaking further analysis and producing a report that will include summary tables of the survey results, which will be available from GNS if you are interested.

## 7 Questions

**Anon:**

I guess you must have been a bit disappointed that you only got a 31% response rate, and I wondered, have you given any thought to perhaps doing face to face sampling of the non-respondents just to check on the validity of the results that you did get or to see whether there were any other factors that you might find useful?

**Wendy:**

No we haven't considered doing that at this stage. [31% is a good response rate for surveys – Ed.]

**Nathan McCoy:**

Nathan McCoy, Wellington City Council. Just one of your earlier slides I wasn't too sure on. I think you gave a figure of 11% of people that considered evacuating because of the tsunami risk. You mentioned earlier that a sub-set of the sample work within the tsunami area is that of the total response of the population or just the ...

**Wendy:**

That was of the total response. We can cross tabulate those results based on the areas that were surveyed – there were three key areas – and get a more accurate response from those who were actually at the coast line, for example one of the coastal communities for their response versus others more in land.

**Nathan McCoy:**

And what was the indication?

**Wendy:**

That cross tabulation hasn't been done at this stage.

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**Tracey:**

Tracey from Nelson City Council. I'm just interested and it might be something you do or the previous speaker surveys on – do you look at the socio-economic areas of different cities, more like suburbs, that are more rental than homeowner and how that information gets out to them. People are often advised if they are ratepayers and if you're renting, you're not a ratepayer. Often you don't get information and just financially it can also be more difficult, so do you kind of target those areas as well?

**Wendy:**

With our surveys?

**Tracey:**

Yes.

**Wendy:**

Yes, as part of the survey we do ask for demographic information such as age and income and whether they rent or own a house, so we do collect that information in the areas that we target we try and have a cross section as well, and we definitely got that cross section with Gisborne.

**John Finnigan:**

John Finnigan from Aurecon. Just a query. You must be very distressed about these statistics, I would have thought. Does someone need to take – or who is or who should be taking a greater responsibility? I mean, just the 7% who had an awareness of tsunami is absolutely mortifying to me and I guess the same for a lot of people – is there a responsibility that should be brought to a higher level? It just seems to scare the pants off me.

**Wendy:**

As far as our report goes, once it has undergone that whole review process, we will be distributing out to the Councils and to the Ministry of Civil Defence Emergency Management for their information.

**Julia:**

Also, I think some of the statistics that have been collected from a number of surveys over the years show that there are generally pretty low levels of preparedness overall in terms of household preparedness and also in communities being involved in meetings and hazard preparedness type activities. I think we should start thinking about new ways of interacting with communities and trying to get people prepared in a different way. The evidence is there that showing people information and just telling people about the risk isn't really going to get them prepared, and there are some new directions that we can take in terms of trying to get communities more involved in taking responsibility for their problems.

**Moira Lawler:**

Moira Lawler from Porirua City Council. I have a related question because while the preparedness, the collective preparedness the sort of neighbourhood planning looked low, the level of actual community engagement looked like it might have been high. You have 70% trust factor which is high. I wonder if you did any mapping against general community engagement, the quality of life information, anything like that? Because there are possibility some effective networks there, they are just not talking about emergency management.

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**Julia:**

Yes I agree with you there. We asked people about general community participation but we haven't looked specifically at other networks and the ways that people are involved with institutions, but I would agree with the fact that there are probably ways that people are involved in their community that aren't directly involved with hazards and so it is important to look at those avenues as well.

**Peter Higgs:**

Peter Higgs from Gisborne District Council. Just responding to that question about the tsunami, up until now people have been asked to self evacuate in the event of an earthquake because if it's a local earthquake then there's no time to evacuate people. Recently we've completed surveys, GNS has done the work and we've actually identified the evacuation areas and we've gone through a full consultation process with all the communities, meetings with schools, letter drops - everybody in the tsunami evacuation area has been given a map and so in answer to that question, we are actually moving a lot forward.

## **8 Acknowledgements**

This research was funded through the FRST 'Natural Hazards and Society' programme.

## **9 Postscript**

The next step in the project is to compare the extrapolated total costs from the surveyed data with actual data from EQC claims.