

WWRP Warning Value Chain Project

Warning Chain Database Questionnaire

I. Purpose

This questionnaire (template) provides for a comprehensive picture of the end-to-end production and flow of information and decision making along the warning chain during a natural hazard event. The template was originally designed for weather events and some guidance may reflect that, but its use is encouraged for other relevant events such as hydrological or geohazard events.

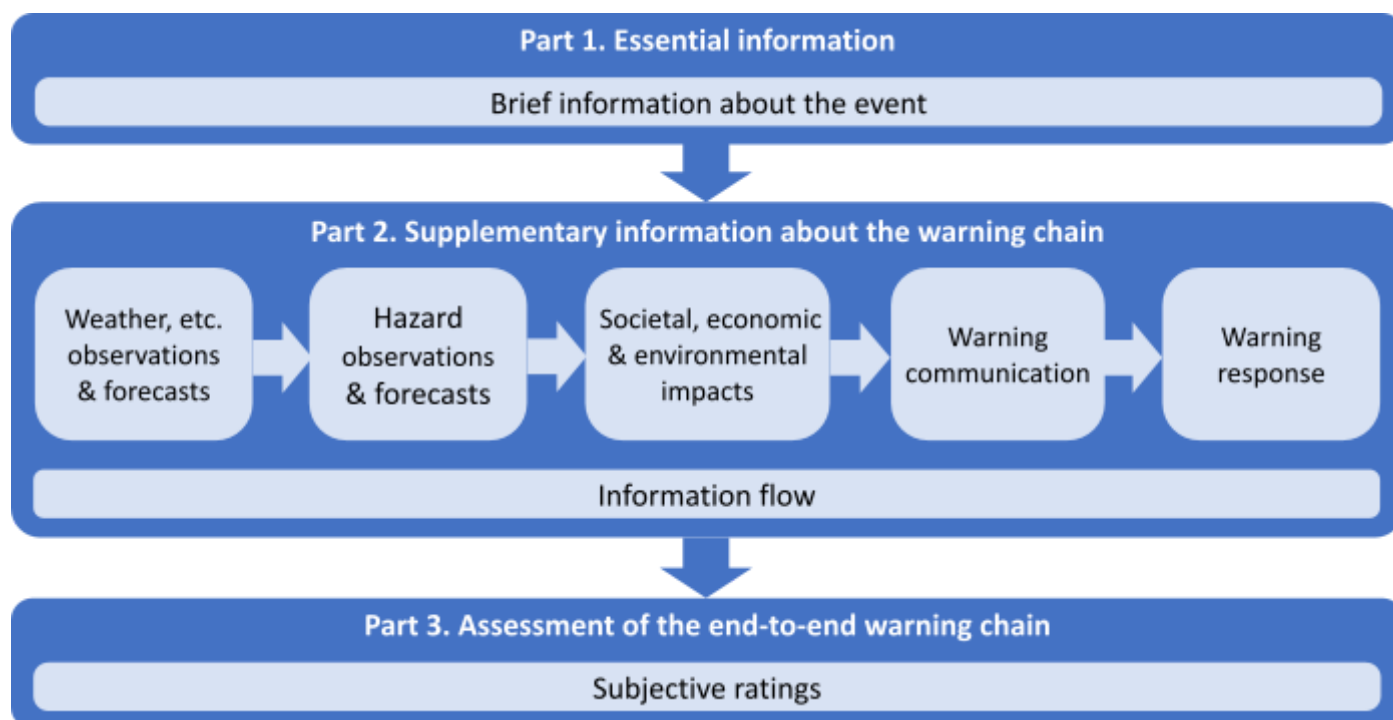
Please use this template to record as much information as possible on the end-to-end warning chain for a particular hazardous event. This information will:

- add to a global database of hazardous events with rich information covering the many components of the warning value chain,
- enable case studies and cross-cutting analysis of end-to-end warning value chains, from simple to complex, to understand effective practices,
- support the value cycle of review and learning from past events to identify improvements that would enhance future warnings.

More information about the WWRP Warning Value Chain Project can be found at <http://hiweather.net/Lists/130.html>.

II. Structure and format

The questionnaire consists of three main parts.



Part 1. The **essential information table** requests brief facts about a particular event, such as what happened, when, where, impacts and responses. This information will help users to filter events. Please provide numerical and short text entries. Links to this event in other databases and catalogues (e.g., ECMWF Severe Event Catalogue, EM-DAT, DesInventar, etc.) about this event should be provided if

possible.

Part 2. The second part requests **supplementary information** about different stages in the warning value chain. This more detailed information and analysis about the weather/hazard source, hazards, impacts, warning communication and warning response will help users understand what was unique about the warning chain for this event. The questions in Part 2 probe many aspects of the warning chain but are not exhaustive. Information here might include:

- Graphics (for example, forecast charts, reanalysis maps, warning graphics, photos of impacts, etc.).
- Videos (for example, from social media, weather service outlooks, etc.).
- Free-form text (for example, description of meteorology, selected extracts from reports, data analysis, tables, etc.)
- Links (e.g., to external reports, media, national archives, policy documents, protocols, meeting records, etc.)

Each section has an "additional analysis" where you can add further information not covered by the items in the questionnaire.

It is not required to complete Part 2, but please provide what information you can. Try to keep your entries brief and include references and links (URLs) to where additional information can be found. Attribute all material that may be subject to copyright (e.g., images and videos).

Many people may contribute information on this event. Where you disagree with another contributor try to provide evidence or example to support your position. You may wish to acknowledge information providers at the end of the template before Annex 1.

Part 3. The **subjective assessment** asks contributors to rate the effectiveness of the individual elements of the end-to-end warning chain, and its overall effectiveness, on a scale of 1 (poor) to 5 (excellent). This may assist users of the database in choosing cases and performing meta-analysis (recognising the large variability in contributors' judgments).

The accompanying [Guide for the Warning Chain Database Questionnaire](#)¹ provides explanation and examples of the type of information that is requested in the questionnaire.

III. How to add resources

Resources for Part 2 (e.g., reports, graphics, data, and other information not easily accessible to the public) should be stored in the [event data library](#) of the respective case study. Brief resources such as forecast maps and warning graphics should be inserted directly into the corresponding section of the template. Reports and extensive graphics are not suitable to be embedded in the template but should be referred to. Please store the resources in the event data library first and then insert as a hyperlink to the template. To do so, follow these steps:

1. Go to the [event data library](#) on Google Drive (open to anyone).
2. For an existing case study, locate the folder for the event for which you would like to add resources. If the event does not exist yet in the library, refer to the [README guide](#) to open a new case study (project members only). If you are a project external contributor, please contact valuechain@bom.gov.au to open a new case study.
3. Place your resource in the folder and give an appropriate name so others know what it is about.

4. Right-click the file you want to embed/refer to and select 'Copy link' to retrieve the hyperlink pointing to the file.
5. In the template, use 'Insert Hyperlink' to paste the hyperlink in the appropriate place.

IV. Tips

- The [Value Chain Glossary](#) provides a common terminology.
- To assist with searching the database, please use the names of hazard types listed in *Annex 1* of this template.
- A series of prompts (i) in this template provide some quick information to assist with entering the requested data. Simply put your cursor over the information symbol i and text should pop up next to it (ignore the “Ctrl+click to follow link” instruction). *Note, that this feature is only available in the Microsoft Word App, not in the SharePoint or Google Drive browser page.* If this feature does not work for you, please consult the [Guide](#) instead.
- A single person may not be able to fill in the entire template. We encourage you to share the template with colleagues who can provide information.
- A worked example of the template is [here](#).
- Questions on the use of this template can be directed to valuechain@bom.gov.au.

V. Completed questionnaire

The completed questionnaire should be stored in the [event data library](#) of the respective case study, or sent to valuechain@bom.gov.au.

Part 1. Essential information

Editors (Name & Institute)	<i>Sara Harrison, GNS Science</i>	
HAZARDOUS EVENT		
Unique identifier i	<i>(This will be added by the Project Team at a later date)</i>	
Name of event	<i>Auckland Heavy Rainfall and Floods January 2023</i>	
When did it happen i?	<i>27 January 2023</i>	
Where did it happen i?	<i>Auckland and the Upper North Island, New Zealand</i>	<input type="checkbox"/> rural <input type="checkbox"/> urban
Links/UIDs to other databases (ECMWF catalogue of severe events, WMO CHE, DesInventar, EM-DAT, GLIDE, etc.)	https://en.wikipedia.org/wiki/2023_North_Island_floods https://confluence.ecmwf.int/display/FCST/202301+-+Rainfall+-+Auckland	
WHAT HAPPENED – WEATHER/HAZARD SOURCE, HAZARDS, IMPACTS, WARNINGS, RESPONSES		
Event type/system that caused hazards i Refer to Annex 1	<i>Extreme rainfally, surface water flood, flash flood</i>	
If possible, provide more detail about weather, etc. observations & forecasts (link to page)		
Were any hazards forecast?	<input type="checkbox"/> yes <input type="checkbox"/> no	
Hazards that caused the main impacts i Refer to Annex 1	<i>Rainfall</i>	
Classify hazard according to the location's climatology or average frequency of occurrence i	<i>New Zealand</i>	
If possible, provide more detail about hazard observations & forecasts (link to page)		
Were any impacts forecast?	<input type="checkbox"/> yes <input type="checkbox"/> no	
Main direct impacts i	<i>25 suburbs in Auckland were affected, major motorways were flooded and closed. 6,000-8,000 homes needed damage assessments to be done. Multiple slips destroyed buildings, including a Manukau Coastguard building. A landslide in Tauranga destroyed a house. As of 12:00 pm on Wednesday 8 February, 277 red placards, 1,615 yellow placards, and 2,566 white placards had been issued on buildings across Auckland. Emergency services in Auckland responded to 719 weather incidents, answered 2,242 emergency calls, and made 126 rescues on Friday and Saturday morning. A total of 811 water damaged cars had to be manually removed from roads, while 20 water damaged buses were removed from service. The New Zealand Insurance Council predicted that the event will result in the highest number of weather related insurance claims on record, with insurance</i>	

	<i>companies expecting that this will be the costliest weather event in New Zealand ever. AA Insurance stated that the floods were its largest vehicle claims event in history. Auckland Airport suffered severe flooding on its runway and terminal buildings, causing damage to planes, flight cancellations, and closure of the domestic terminal for less than 24 hours, and closure of the international terminal for over 24 hours.</i>
Economic damage in USD i	<i>The total insurance cost is estimated to hit NZ \$1billion</i>
Fatalities	<i>Four people died on 27 January; two drowned in Wairau Valley on the North Shore, one was killed by a slip in Remuera, and one drowned in the Waikato town of Onewhero. Countless numbers of animals were lost and died in the floods.</i>
If possible, provide more detail about impact observations & forecasts (link to page)	
Were any warnings issued?	<input type="checkbox"/> yes <input type="checkbox"/> no
Main warnings issued i	<p>Orange rain warnings were issued by the MetService before the beginning of the event, and it was upgraded on the evening of the 27 January to a Red rain warning for Auckland (after flooding began).</p> <p>In anticipation for more heavy rain arriving on Tuesday 31 January and Wednesday 1 February, MetService issued red rain warnings again for Northland, northern Auckland, Coromandel, and parts of the Bay of Plenty, while an orange rain warning was issued for southern and central Auckland.</p> <p>No phone alerts were issued during the initial events on Friday, but on Sunday 29 January, at 7:47 pm, Auckland Emergency Management issued an emergency alert across Auckland via the cellular phone network, warning of possible heavy rain and thunderstorms over the following 12-hour period.[43] Another alert was issued at 3:32 pm on Tuesday 31 January, warning of more rain north of Orewa over Tuesday and Wednesday.</p> <p>Further investigation is needed to verify whether Auckland Council issued a public flood warning for this for this event.</p>
Who issued the warnings? i	<i>MetService issued orange and red rain warnings. Auckland Emergency Management issued Emergency Mobile Alerts.</i>
If possible, provide more detail about the warnings & communication (link to page)	
Main responses to warnings i	
If possible, provide more detail about responses to warnings (link to page)	

Part 2a. Supplementary information about the source of the hazard i

Wherever possible, please include references to information you provide.

Editors (Name & Institute):

Situational overview i

===== **Weather forecast** =====
(Adapt as required for non-meteorological forecasts)

Special/non-traditional observational data used in the weather forecast or assimilated into NWP i

Comment on the adequacy of the observations available for the weather forecast i

Weather models (short- and long-range) i

Name	Horizontal resolution	Ensemble size	Forecast length

Post-processing/calibration applied to weather model output i

Weather forecast outputs and examples i

Interpretation/guidance for forecast users i

What was the level of agreement between the different forecasts? i

How reliable and accurate were weather forecasts at different lead times? i

When was the potential event first detected in the models? i

===== **Observations** =====

Weather observations and analyses i

How did the observed weather relate to climatology and/or previous extreme events? i

Additional analysis i

Successes/issues/challenges experienced i

Part 2b. Supplementary information about hazards i

Wherever possible, please include references to information you provide.

Editors (Name & Institute):

Brief overview of the hazard event(s) i

===== Hazard forecast =====

Observational data used in the hazard forecast or assimilated into the hazard model i

Comment on the adequacy of observations available for the hazard forecast i

Hazard prediction models/tools i

Name	Resolution	Ensemble size	Forecast length

Hazard forecast outputs and examples i

How reliable and accurate were the hazard forecasts? i

What process or trigger(s) identified the event as hazardous and started the warning process? i

===== Hazard Observations =====

Hazard observations and analyses i

What crowdsourcing/citizen science was used for hazard observations? i

How did the hazard(s) relate to climatology? i

How was the hazard(s) made worse by pre-existing conditions? i

Additional analysis i

Successes/issues/challenges experienced i

Part 2c. Supplementary information about impacts i

Wherever possible, please include references to information you provide.

Editors (Name & Institute):

Brief overview of the impact(s) i

===== **Impact forecast** =====

Data used in the impact forecast or model i

Impact prediction models/tools (if used) i

Name	Method

Informal rules/tools used to identify impacts i

Impact forecast outputs and examples i

Comparison of predicted/expected and actual impacts i

===== **Impact Observations** =====

Observed impacts:

Health and social impacts i:

Property and business impacts i:

Critical infrastructure damage and service disruption i:

Environmental damage i:

What crowdsourcing/citizen science was used for impact observations? i

Who and what were exposed to the hazards, when, for how long? i

Of those exposed, who and what were vulnerable to the hazards and why? i

Additional analysis i

Successes/issues/challenges experienced i

Part 2d. Supplementary information about warning communication

Wherever possible, please include references to information you provide.

Editors (Name & Institute):

Brief overview of the communication “story” i

What information was provided to emergency responders, government and other stakeholders about the hazard and its possible impact(s), and by whom? i

Public warnings i

Warning name	Icon / colour	Lead time	Frequency	Issued by i	Warning area i	Type of warning i	Did it include safety advice?	Scaled i	Channels i

How was warning information communicated by other organizations including media? i

Warning outputs and examples i

Comment on the use of uncertainty information in the warning i

To what extent were communication systems in place and operating effectively? i

To what extent were warning messages received and understood by the public? i

To what extent was crowdsourcing/citizen science used for warning dissemination? i

Comment on how the needs of specific communities and populations were addressed i

Additional analysis i

Communication success/issues/challenges experienced i

Part 2e. Supplementary information about responses

Wherever possible, please include references to information you provide.

Editors (Name & Institute):

Brief overview of the response to the hazard by emergency services and other partners i

What were the main response actions by the public to the warnings? i

Institutional responses i

Response actions	Taken by whom	When taken	On the basis of what information?	Benefit (if any)	Cost

How did the overall response to this event compare to similar previous events? i

Comment on the existence and use of disaster preparedness and response plans i

How did the key decision makers and institutions interact before, during and after the event?

How knowledgeable was the community about the hazard and its associated risks? i

What capacity did the community have to respond to warnings? i

Additional analysis i

Success/issues/challenges experienced i

Part 2f. Analysis of the warning chain

Wherever possible, please include references to information you provide.

Editors (Name & Institute):

Information flow through the warning chain i

Warning chain	Was all necessary input information available? (yes/partially/no)	If not or partially available, what input information was missing?	Who should have provided the missing information?
Weather, etc. forecast			
Hazard forecast			
Impacts forecast			
Warning communication			
Response			

Tools and operational workflows for sharing information between partners i

How useful were social media/crowdsourcing/citizen science in the warning chain? i

Evidence that warning chain was effective in reducing fatalities, injuries, damage, and/or disruption i

What were the strongest links (information flow) in the warning chain? i

What were the weakest links (information flow) in the warning chain? i

What procedures were used to identify lessons learned from the event? i

Comment on lessons learnt from previous events and their contributions to greater warning success for this event i

Additional analysis i

Part 3. Assessment of the end-to-end warning chain

Your profession:

Please rate your level of expertise on a scale of 1 (no expertise) to 5 (established expert) for:

Hazard source (e.g., weather):

Hazard:

Impact:

Warning/communication:

Response:

High-impact weather event evaluation:

HOW SUCCESSFUL WERE THE FORECASTS, WARNINGS AND RESPONSES?

How well do you think the event was observed? *Scale of 1 (poor) to 5 (excellent)*

Reason for this rating i

How well do you think the source of the hazard (e.g., weather) was forecast? *Scale of 1 (poor) to 5 (excellent)*

Reason for this rating i

How well do you think the hazards were forecast? *Scale of 1 (poor) to 5 (excellent)*

Reason for this rating i

How well do you think the impacts were predicted? *Scale of 1 (poor) to 5 (excellent)*

Reason for this rating i

How well do you think warnings were communicated? *Scale of 1 (poor) to 5 (excellent)*

Reason for this rating i

How well do you think the warnings were used? *Scale of 1 (poor) to 5 (excellent)*

Reason for this rating i

How well do you think the entire warning chain performed overall? *Scale of 1 (poor) to 5 (excellent)*

Thank you very much for contributing to the WWRP Warning Value Chain Project database!

Acknowledgements of information providers (optional):

Annex 1: List of hazards adapted from the [UNDRR-ISC Hazard Information Profiles](#)

* = not in UNDRR-ISC list of hazardous events

1. Convective-related

- Downburst
- Lightning (Electrical Storm)
- Thunderstorm

2. Flood

- Coastal Flood
- Estuarine (Coastal) Flood
- Flash Flood
- Fluvial (Riverine) Flood
- Groundwater Flood
- Ice-Jam Flood Including Debris Ponding (Drainage)
- Snowmelt Flood
- Surface Water Flooding
- Glacial Lake Outburst Flood

3. Lithometeors

- Black Carbon (Brown Clouds)
- Dust storm or Sandstorm
- Fog
- Haze
- Polluted Air
- Sand haze
- Smoke
- Volcanic gases and aerosols

4. Marine

- Ocean Acidification
- Rogue Wave
- Sea Water Intrusion
- Sea Ice (Ice Bergs)

- Ice Flow
- Seiche
- Storm Surge
- Storm Tides
- Tsunami
- Pumice*

5. Pressure-related

- Depression or Cyclone (Low Pressure Area)
- Extra-tropical Cyclone
- Sub-Tropical Cyclone

6. Precipitation-related

- Acid Rain
- Rain*
- Blizzard
- Drought
- Hail
- Ice Storm
- Snow
- Snow Storm
- Ash/Tephra Fall

7. Temperature-related

- Cold Wave
- Dzed
- Freeze
- Frost (Hoar Frost)
- Freezing Rain (Supercooled Rain)
- Glaze
- Ground Frost

- Heatwave
- Icing (Including Ice)
- Thaw

8. Terrestrial

- Avalanche
- Mud Flow
- Rockslide
- Landslide
- Lahar
- Lava Flows
- Ballistics
- Pyroclastic Density Current
- Ground Shaking

9. Wind-related

- Derecho
- Gale (Strong Gale)
- Squall
- Subtropical Storm
- Tropical Cyclone (Cyclonic Wind, Rain [Storm] Surge)
- Tropical Storm
- Tornado
- Wind

10. Environmental

- Wildfires
- Crown fire*
- Surface fire*
- Ground fire*
- Coastal Erosion