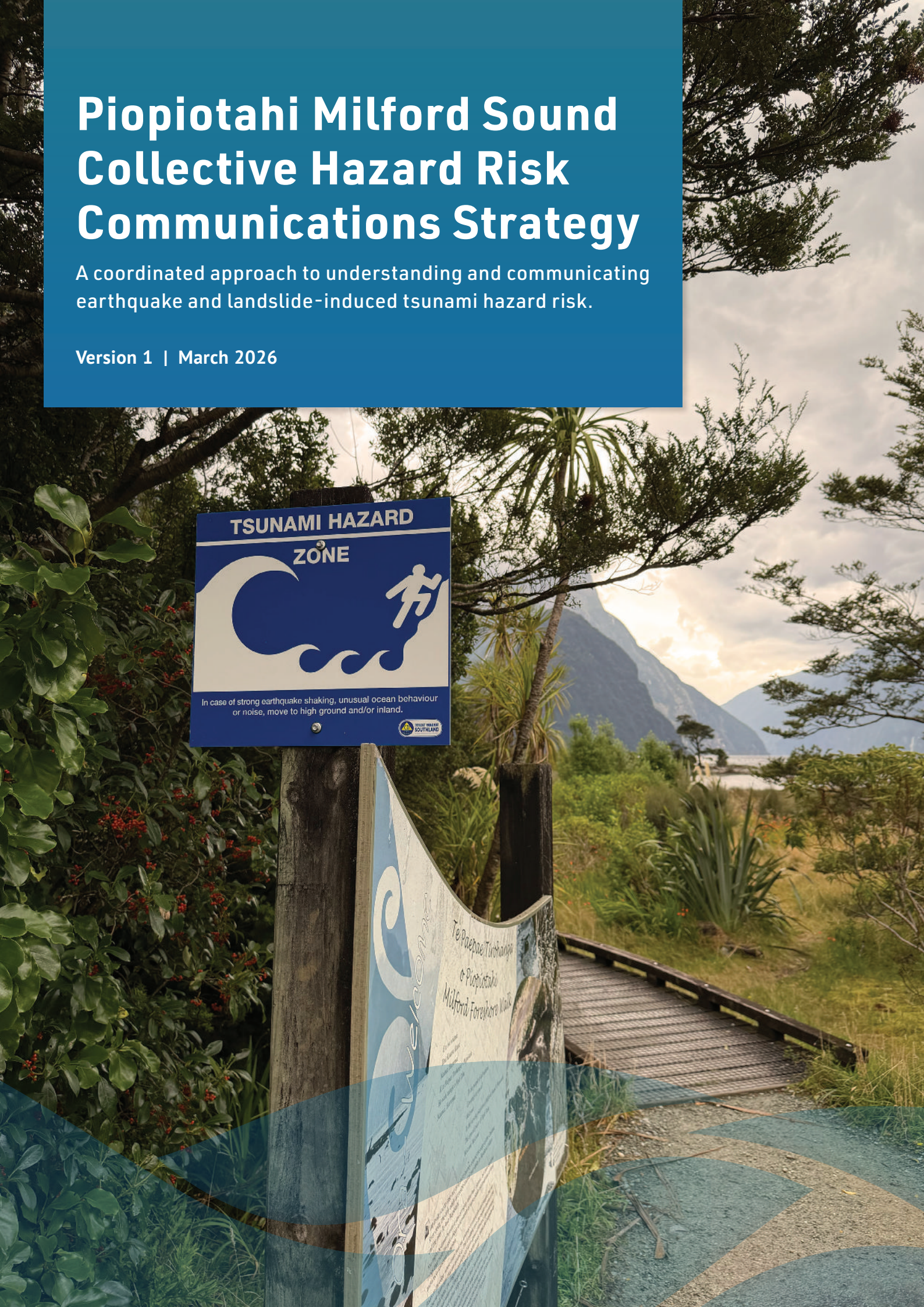
Piopiotahi Milford Sound Collective Hazard Risk Communications Strategy

A coordinated approach to understanding and communicating earthquake and landslide-induced tsunami hazard risk.

Version 1 | March 2026



Disclaimer

This Collective Hazard Risk Communication Strategy is not an emergency response or evacuation plan. It does not replace, override, or provide operational instructions for managing or responding to natural hazard events.

This strategy is intended solely to support the coordinated communication of natural hazard risk information to staff, visitors, and stakeholders.

Operational plans and procedures, emergency management, and life-safety decisions remain the responsibility of the relevant agencies and organisations, in accordance with their statutory roles, response plans, and established procedures.

Information contained within this strategy reflects current understanding of hazard risk at the time of development and is subject to change as new scientific, operational, or contextual information becomes available.

Implementation of this strategy remains the responsibility of individual organisations, operators, businesses and agencies.

Version 1 March 2026

Acknowledgements

This Collective Hazard Risk Communication Strategy has been co-developed by Emergency Management Southland, Department of Conservation, Milford Sound Tourism Ltd., Te Ao Marama Inc., Tourism New Zealand, Great South, Southern Discoveries, Real NZ, the AF8 Programme, and the National Emergency Management Agency. It is based on advice from GNS Science (now ESNZ), commissioned in 2024.

Contents

Introduction

Piopiotahi Milford Sound is one of Aotearoa New Zealand's most iconic and remote tourist destinations. It is also a location with significant natural hazard risk, particularly from earthquakes and landslide-induced tsunamis. The complexity of the visitor journey, limited evacuation options, and multilingual, multinational audiences present unique challenges in communicating that risk effectively and responsibly to visitors and workers.

Recent research[1] has improved our understanding of the tsunami risk, but further science is needed to fully quantify and manage it. In response, the National Emergency Management Agency (NEMA), Emergency Management Southland (EMS), the Department of Conservation (DOC), Milford Sound Tourism Limited (MSTL), Southland District Council (SDC), and the Ministry of Business Innovation and Employment (MBIE) formed a Milford Working Group. They have initiated a multi-stage project to improve our understanding of natural hazard exposure and risk to life from tsunami hazards for both visitors and workers at Piopiotahi Milford Sound.

While that research is underway, all partners agree there should be no delay in communicating what we know now. This Collective Hazard Risk Communication Strategy establishes a coordinated, evidence-based approach to communicating natural hazard risk to visitors and workers – ensuring they receive accurate and consistent information, at the right time and through the right channels – so they can make informed decisions before and during their visit.

While some natural hazard risk information is already shared with visitors and workers, this strategy focuses specifically on earthquake and landslide-induced tsunami risk at Piopiotahi Milford Sound – a known hazard that is currently absent from most risk messaging. It is based on advice[2] from GNS Science (now ESNZ), in a report commissioned by the Milford Working Group in 2024. The report provides a shared evidence base and guidance on communicating earthquake and landslide-induced tsunami risk based on current knowledge.

Where formal best-practice guidelines do not yet exist, this strategy provides a practical framework for operators, agents, businesses and organisations involved in advertising, selling and hosting experiences at Piopiotahi Milford Sound. Implementation of the messaging, however, remains the responsibility of individual organisations.

1. Harris, O. L. et al. (2024). Agent-based modelling of evacuation scenarios for a landslide-generated tsunami in Milford Sound, New Zealand.

   Darling, M. J., et al. (2025). Minutes matter for life safety and risk exposure in Milford Sound, New Zealand.

2. Charlton, D. H., et al. (2025) Landslide-induced tsunami risk communication advice for visitors and workers in Milford Sound / Piopiotahi.

Purpose

This strategy aims to ensure that visitors and workers at Piopiotahi Milford Sound are aware of the area's natural hazards, understand that there is a risk to life when on-site, know where to find more information, and can make informed decisions about their visit — before they travel and while they are there.

It identifies key audiences, channels, and messages — providing an agreed minimum viable messaging (MVM) baseline to ensure hazard risk communication is consistent, achievable, and coordinated across all partners and operators from the outset. It also includes short-form messaging for when more context is helpful.

Who is it for?

This strategy is for operators, agents, businesses and organisations who advertise, sell and host experiences at Piopiotahi Milford Sound, particularly those who employ staff on-site and/or host visitors (domestic and international) including:

- Organisations, tourism operators and agents, businesses and visitor sites located outside of Piopiotahi Milford Sound, where potential visitors and/or workers find and receive information about the area, before deciding to visit or work there.
- Organisations, operators, businesses and visitor sites located at Piopiotahi Milford Sound and along routes to the area, where visitors and/or workers interact with information during their time there.

It includes recommendations to support operators, agents, businesses and organisations to communicate consistent risk messaging, while recognising that implementation remains the responsibility of individual organisations.

This document is designed as a living strategy to ensure our collective approach to risk communication and the consistent messages remain current and fit for purpose.

This strategy:

1. Establishes a unified approach to communicating natural hazard risk to visitors and workers before and during their visit to Piopiotahi Milford Sound.
2. Increases awareness and improves understanding of tsunami hazard risk specific to Piopiotahi Milford Sound based on the latest scientific evidence and modelling.
3. Establishes an evidence-based minimum viable messaging (MVM) baseline for consistent hazard communication across all partner agencies and operators.
4. Identifies target audiences and maps their journeys, ensuring opportunities to deliver messages are identified and consistent messaging can reach people at key decision-making points.
5. Identifies the channels, tools, and touchpoints through which risk messages could be delivered, including digital platforms, physical signage, and worker inductions.
6. Supports agencies and operators to meet their PCBU (Person Conducting a Business or Undertaking) obligations by providing consistent, accessible hazard risk messaging for workers at Piopiotahi Milford Sound.
7. Provides an indicative plan for review and renewal so the strategy remains current as new science, modelling, and operational improvements emerge.

Indicative review and renewal process	
Late 2026	Interim review of strategy following completion of research stage one and implementation feedback.
2027	Review and update of strategy following the completion of hydrodynamic tsunami modelling specific to Piopiotahi Milford Sound.
TBC	Review and update of strategy to incorporate new knowledge and operational improvements following proposed future research stages: ▪ Exposure modelling to better understand vulnerability of people and boats at Piopiotahi Milford Sound. ▪ Quantification of individual risk to visitors and workers, based on exposure modelling. ▪ Analysis of potential mitigation options (and their implementation) based on hazard and risk model outputs.

Approach

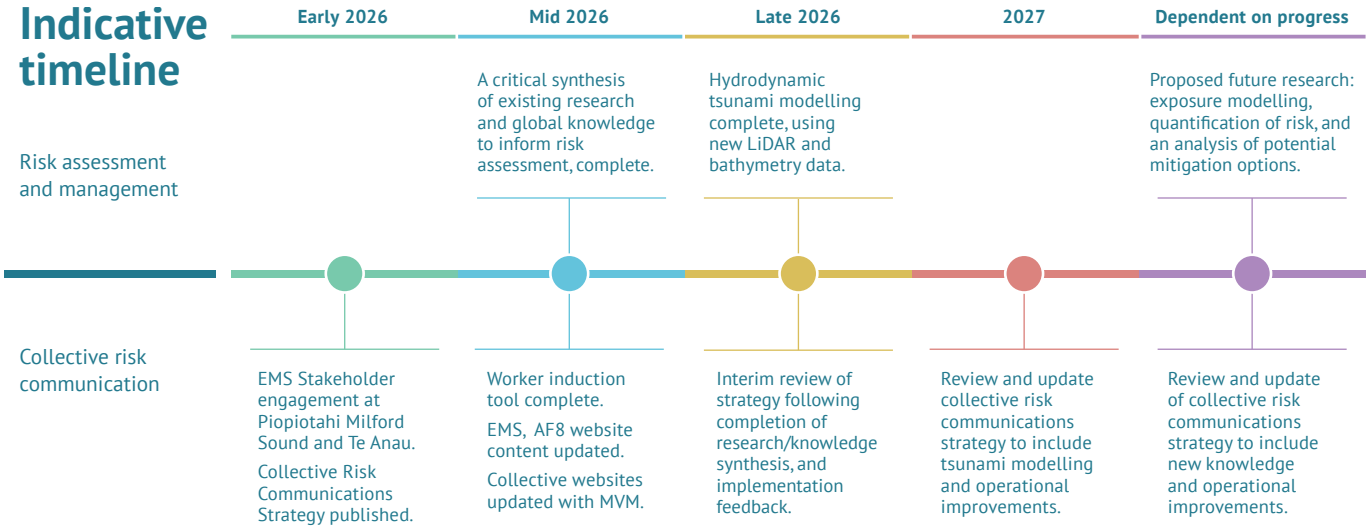
This strategy takes a phased approach, recognising that while further science is needed to quantify and manage the risk of landslide-induced tsunami at Piopiotahi Milford Sound, there is no reason to delay the communication of what is already known. The indicative timeline below summarises the two concurrent workstreams:

- Risk assessment and management: The science research required to quantify and manage the risk of landslide-induced tsunami at Piopiotahi Milford Sound, and;
- Collective risk communication: The development of a collective hazard risk communication strategy to establish a unified approach to communicating that risk to visitors and workers.

The timeline indicates when potential updates to this strategy and its messaging can be expected. It shows how the two workstreams align so that new knowledge can be incorporated into collective risk communication activities as the science research, risk modelling and operational improvements progress. Actions already taken are included on pages 12-13.

This approach enables organisations, businesses and visitor sites to begin implementing consistent, evidence-based risk messaging now. Then, as new science, updated risk information, and operational improvements become available, consistent messaging can be reviewed and new knowledge incorporated.

Indicative timeline



Early 2026	EMS Stakeholder engagement at Piopiotahi Milford Sound and Te Anau. Piopiotahi Collective Risk Communications Strategy complete, and ready for implementation.
Mid 2026	Research Stage One complete – A critical synthesis of existing research relevant to Piopiotahi, and global knowledge to date. It includes an international review of examples of landslides into fiords and lakes, as well as a review of the management of such risks (both individual and societal). To improve our common understanding of the problem, inform agency responsibilities and provides the foundations for tsunami modelling and risk assessment.
	The Collective websites updated with consistent messaging. EMS and AF8 websites updated with longer-form messaging and science explainer content that others can link back to. Worker online induction tool complete.
Late 2026	Research Stage Two complete – Hydrodynamic tsunami modelling specific to Piopiotahi Milford Sound, using new LiDAR and bathymetry data. It will provide detailed modelling of tsunami hazard properties such as peak flow-depth and water-velocity, suitable for loss modelling purposes.
	Interim review of the Collective Risk Communications Strategy following completion of Research Stage One: A critical synthesis of research and knowledge, and feedback on the initial implementation of this strategy.
2027	Review and update of Collective Risk Communications Strategy to include findings of Research Stage Two: Hydrodynamic tsunami modelling, and any operational improvements at Piopiotahi Milford Sound.
TBC	Proposed future research stages: ▪ An exposure model specific to the tsunami hazard at Piopiotahi, which includes vulnerability of people and boats. ▪ A robust calculation of individual risk to staff and visitors, and the societal risk for Aotearoa New Zealand. ▪ An analysis of potential mitigation options based on new hazard risk modelling.
	Proposed review of Collective Risk Communications Strategy to include new knowledge and operational improvements.

How to use

The following actions are recommended for operators, agents, businesses and organisations who advertise, sell and host experiences at Piopiotahi Milford Sound. By acting on these recommendations, we can collectively ensure visitors and workers receive consistent, evidence-based information about natural hazard risk at Piopiotahi Milford Sound.

1. Update your website

Review and adopt the consistent risk messaging provided in this strategy. Apply minimum viable messaging to any webpage that features content aimed at visitors/workers to Piopiotahi Milford Sound. Make more detailed information available by linking back to the EMS and AF8 webpages.

- civildefencesouthland.govt.nz/piopiotahi-milford-sound
- af8.org.nz

This ensures visitors and workers encounter consistent, accurate information wherever they search — and that your site reinforces, not contradicts, what they will find elsewhere. Outdated information that no longer reflects current risk messaging should be archived or updated. Where possible, encourage other websites in your network to do the same.

2. Talk to your staff

Share this strategy with your staff. Ensure that any who work on-site and/or interact with visitors are aware of the natural hazard risk at Piopiotahi Milford Sound, and understand how to use the consistent messages.

This includes frontline staff, customer service teams, sales staff, and guides. Staff should be able to answer basic questions confidently, know where to direct visitors for more information, and avoid contradicting the agreed consistent messaging.

3. Use the worker induction tool

A worker induction tool is being developed to support organisations and operators to brief workers on natural hazard risk at Piopiotahi Milford Sound. It will be hosted by Emergency Management Southland, and available for all organisations and operators to use in their induction processes. Access to the tool will be managed by a login.

All organisations that employ workers at, or in connection with, the area are encouraged to incorporate this tool into their onboarding and induction processes. Using the shared tool ensures that all workers receive the same consistent, accurate information regardless of their employer. The tool will be available in mid-2026.

4. Make it part of your sales and booking process

The period between deciding to visit and departing for Piopiotahi Milford Sound is the most important window for the communication of natural hazard risk — when visitors and workers can make informed decisions before they travel.

Where your organisation is involved in selling, booking, or facilitating visits to Piopiotahi Milford Sound, please incorporate the minimum viable messaging as a standard part of the customer experience. This could include:

- Including a brief, plain-language summary of natural hazard risks on booking confirmation emails or pre-departure communications
- Adding an acknowledgment checkbox to your terms and conditions or booking process, confirming that visitors have read and understood the key safety information
- Briefing clients verbally as part of check-in, tour orientation, or transport departure — particularly for coach operators, rental car companies, and aviation operators whose customers are travelling to Piopiotahi Milford Sound.

The goal is not to alarm visitors, but to ensure they have had a genuine opportunity to understand the natural hazard risks before they arrive at Piopiotahi Milford Sound.

5. Update your signage and printed collateral

Review any physical materials that reference Piopiotahi Milford Sound — brochures, maps, rack cards, in-vehicle information, and departure point signage — and update them to reflect the agreed risk messaging, when and where appropriate.

Where signage or printed materials are due for refresh, use the opportunity to incorporate the key hazard information and protective action guidance. Any materials that contain outdated or inconsistent hazard information should be replaced or withdrawn from circulation.

6. Stay informed of messaging updates

This strategy is a living document that will be updated as new scientific information becomes available — in particular, findings from the tsunami modelling.

You are encouraged to stay connected with project updates so that your websites, printed materials, and staff knowledge remain current. Updates will be communicated through the EMS webpage – civildefencesouthland.govt.nz/piopiotahi-milford-sound.

When updates are issued, treat them as a prompt to review your own materials against the latest agreed messaging and make any necessary changes in a timely way.

Consistent messaging

These consistent messages have been developed in alignment with technical advice and available scientific evidence. They have been reviewed against NEMA's national consistent messaging guide[3] and endorsed by the Milford Working Group and The Collective (see page 11).

All partner organisations are encouraged to adopt these messages verbatim where possible or adapt them minimally to suit specific communication channels while maintaining core content and framing. This consistency will ensure that regardless of where people encounter information about Piopiotahi Milford Sound they will receive the same risk messaging and be able to make informed decisions, before they travel.

These messages are designed for use across multiple channels and touchpoints, and are structured in two tiers:

- Minimum viable messages – a set of high-level, essential messages to enable informed decision-making about the risk. For use when space is limited and communication needs to be direct.
- Short-form messages – a set of short messages that may be used all together or copied as individual points. For use on websites, printed collateral and social media, when some extra details and context is useful.

Minimum viable messages

A set of high-level, essential messages to enable informed decision-making about the risk. For use when space is limited and communication needs to be direct.

All operators, agents, businesses and organisations who advertise, sell and host experiences at Piopiotahi Milford Sound. are encouraged to apply these minimum viable messages to any channels that feature content aimed at visitors/workers to Piopiotahi Milford Sound.

Earthquake and tsunami risk at Piopiotahi Milford Sound

- A large earthquake or tsunami is extremely unlikely during your visit, especially a short one.
- Even so, these hazards do pose a risk to life at Piopiotahi Milford Sound.
- If one occurs while you are there, your options to stay safe are limited.
- Know before you go: find out more about earthquakes and landslide-induced tsunami risk at Piopiotahi Milford Sound.
- https://civildefencesouthland.govt.nz/piopiotahi-milford-sound

What to do:

- In an earthquake, DROP, COVER and HOLD until shaking stops.
- If an earthquake feels LONG or STRONG, Get GONE. Move up and away from waterways (the fiord and rivers) as quickly as possible.
- If you see/hear a landslide, move up and away from waterways (the fiord and rivers) as quickly as possible.

3. Nationally agreed, consistent messages for all civil defence emergency management organisations and emergency services to use (2025).

Short-form messages

A set of short messages that may be used all together or copied as individual points. For use on websites, printed collateral and social media, when some extra details and context is useful.

Aotearoa New Zealand

- Powerful natural forces have shaped Aotearoa New Zealand over millions of years. Earthquakes and volcanoes lifted these beautiful islands out of the Pacific Ocean. They have created the dramatic landscapes we enjoy today.
- Natural hazards are part of life here. Around 20,000 earthquakes are recorded each year. Most are small and go unnoticed, but larger events can cause damage. Understanding the hazards and how to stay safe is an important part of planning your visit.

Piopiotahi Milford Sound

- Dramatic and ever-changing, Piopiotahi Milford Sound is one of the world's most spectacular and special environments. Its steep, glacier-carved mountains and deep fiord have been shaped by powerful geological forces over millions of years.
- The area is exposed to risk from a range of natural hazards. These can occur at any time, and some can happen without warning. Of all the hazards, large earthquakes, landslides and tsunamis pose the greatest risk to people at Piopiotahi Milford Sound.
- It is extremely unlikely that one will happen during your visit, especially for a short stay. However, there is a risk and the longer you spend there, the higher it becomes. Once you are there, your safety options are limited and it is important you understand the risks, before you go.

Earthquakes at Piopiotahi Milford Sound

- Like the rest of Aotearoa New Zealand, small earthquakes occur regularly in Fiordland. We don't feel them and they don't bother us. These small movements are a normal part of how the land works and do not pose a risk to people.
- Sometimes, earthquakes in or near Fiordland are felt at Piopiotahi Milford Sound. They might shake objects on a shelf or rattle a window, but they do not cause major impacts or disrupt your visit.
- Occasionally, a stronger earthquake can trigger avalanches, rockfall or landslides. These can cause debris to fall onto roads, jetties and tracks, and may disrupt your travel plans if you happen to be nearby.
- Large earthquakes are rare, and extremely unlikely to happen during a short visit. But they will happen again.
- The Alpine Fault runs almost the entire length of the South Island and crosses the entrance to Piopiotahi Milford Sound. It can generate earthquakes of magnitude 8 or greater, occurring on average every 300 years. There is a 75% chance of this happening in the next 50 years (find out more at af8.org.nz). An earthquake of this size would almost certainly affect the narrow waterway and surrounding area.

What to do in an earthquake:

- DROP, COVER and HOLD until shaking stops. Most injuries from earthquakes happen when you try and move during the shaking. The lower to the ground/floor you are, the less likely you are to be injured.
- Follow staff instructions and/or move up and away from waterways (the fiord and rivers) as quickly as possible.

Landslides at Piopiotahi Milford Sound

- The steep mountains around Piopiotahi Milford Sound are prone to rockfall and landslides. Earthquakes and severe weather can make the cliffs unstable, sending rock and debris down at speed.
- Smaller rockfalls are common but often go unnoticed, unless you are nearby.
- Bigger landslides do not happen often. The chance of one occurring during a short visit is extremely unlikely. However, they could cause a tsunami in the fiord and do pose a risk to life at Piopiotahi Milford Sound.
- Large earthquakes are the most common trigger of big landslides in Fiordland. A large earthquake during your visit is extremely unlikely, especially for a short stay.

Be prepared for landslides

- Take extra supplies, food, water, first aid, clothes in your vehicle when travelling in remote areas, in case you get stuck – The road from Te Anau to Piopiotahi Milford Sound, is prone to avalanches, rockfall and landslides. It is monitored 24/7 by the Milford Road Alliance. However, if you get stuck, it will take time for help to reach you. Having extra supplies in your vehicle will make the wait time more comfortable.
- If you see or hear a landslide entering the water, dust clouds, loud rumbling, or splashing. Follow staff instructions and/or move up and away from waterways (the fiord and rivers) as quickly as possible.

Tsunami at Piopiotahi Milford Sound

- Like all of Aotearoa New Zealand's coastline, Piopiotahi Milford Sound is at risk of tsunami from multiple sources.
- The most common threat comes from distant earthquakes in the Pacific Ocean. These ocean-source tsunamis take hours to reach our shores. Official warnings are issued in time for people to move to safety.
- Less common, but of more concern, is the potential for a large landslide to fall into the fiord and trigger a tsunami.
- Landslide-triggered tsunamis are rare. The chance of one occurring during your visit is extremely unlikely. However, they can create large waves and do pose a risk to life at Piopiotahi Milford Sound.

Be prepared for tsunamis

- Triggered by an earthquake – If you feel a LONG (1 minute or more) or STRONG (cannot stand up) earthquake, while at Piopiotahi Milford Sound, Get GONE. Move up and away from waterways (the fiord and rivers) as quickly as possible.
- Triggered by a landslide – If you see or hear a landslide entering the water, dust clouds, loud rumbling, splashing or unusual water behavior, GET GONE. Move up and away from waterways (the fiord and rivers) as quickly as possible.

Plans and preparedness

- Piopiotahi Milford Sound has emergency response plans. These coordinate multiple agencies in a State or Emergency. The plans cover earthquakes, tsunami, landslides, avalanches, flooding, severe weather and other emergencies.
- All tourism operators maintain their own emergency procedures. These integrate with the wider response in a State of Emergency.
- If a large landslide triggers a tsunami, there will be no warning. Emergency support will take time to arrive. Visitors and workers should be aware of the risk to life and prepared to move up and away from waterways (the fiord and rivers) as quickly as possible.

Audiences & Channels

Piopiotahi Milford Sound is a major tourist destination, and a workplace and temporary home, for many tourism-industry workers. Visitors and workers are the two primary groups exposed to the area's dynamic and hazardous landscape. These groups, including their respective sub-groups, are the key audiences for this Collective Hazard Risk Communication Strategy, as they are likely to experience the highest levels of life-safety risk at Piopiotahi Milford Sound.

This section outlines who, why and where we communicate with by mapping visitor/worker journeys, defining the knowledge and awareness we want them to have at each stage of the journey, and identifying channels and touchpoints for effective communication. It identifies common channels where risk information can reach multiple audiences at once, and unique channels, which must also be used to reach specific audiences effectively.

Audiences

Defining the audiences, understanding how they travel and identifying their decision making points, is fundamental to ensuring consistent risk information reaches them, at the right time, in the right place, and in a form they can act on.

A Independent visitors	Also known as 'free independent travellers' (FITs). These individuals arrive and undertake activities at Piopiotahi Milford Sound independently (mostly self-driving) but may also go on tours once they have arrived on site (e.g. boat, kayak) or head to the Milford Track. FITs typically visit for a few hours, although they generally have more flexibility and may stay longer than group tourists. Some stay overnight in the lodges or on boats. FITs can be either domestic or international.	**How they travel:** Vehicles (rental or private) Buses (transport-only) Fixed wing aircraft (including charter flights) Helicopters Boats (low numbers) Walking tracks
B Group visitors	These individuals are part of group tours mostly departing from Queenstown and Te Anau, and include long-duration, national tour itineraries whose operators are not frequent or local operators. Travellers in this group often only visit for a few hours, undertaking one of the tours. Cruise-ship passengers are also included in this group but these passengers stay on the water only. This group may comprise a high percentage of internationals, including non-English speakers. Individuals within this group are less likely to reside in New Zealand.	**How they travel:** Vehicles (buses) Fixed wing aircraft (including charter flights) Helicopters Cruise ships Guided walks
C Boat users	These individuals are often locally based and use watercraft out on the fiord. This group also includes commercial fishermen; loading and unloading at the wharf. They typically spend up to a day in the area. It is difficult to estimate the number of boat users as they are not required to register.	**How they travel:** Vehicles with boat in tow Boats (low numbers)
D Day workers	Some employees work on-site in Piopiotahi Milford Sound, commuting each day from locations such as Te Anau and the wider Southland Region. Workers may be domestic or international.	**How they travel:** Vehicles Fixed wing aircraft Helicopters
E Overnight workers	Some employees (roughly 200–300) temporarily reside on-site in Piopiotahi Milford Sound for a few days through to months and years. They live in staff accommodation on-site. Workers could be domestic or international.	**How they travel:** Vehicles Fixed wing aircraft Helicopters

Mapping Visitor Journeys:

Almost all people who travel to Piopiotahi Milford Sound go through several steps from before point of sale, or offer of employment, through to arrival on site. Based on the advice from GNS Science (now ESNZ) this strategy defines four key steps of a visitor/worker journey to identify decision-making points and guide the implementation of consistent messaging.

1. Considering – the process of looking for information before deciding to visit or work at Piopiotahi Milford Sound.
2. Confirming – for visitors: the process of booking online or in-person before travelling to Piopiotahi Milford Sound. For workers: the process of accepting a job offer and completing online worker induction tool.
3. Travelling – the actual journey to Piopiotahi Milford Sound by independent vehicle (rental or private), walking track, bus, boat, cruise ship or aircraft.
4. Experiencing – the experience of spending time at Piopiotahi Milford Sound, including the visitor terminal, accommodation areas, car parks, on the road, walking trails, the jetty, and on the water.

Audience journey maps

These maps show how each audience group typically moves through their journey to Piopiotahi Milford Sound.

They where consistent risk messaging should be deployed to ensure they receive the right information at the right time.

	Considering	Confirming	Travelling	Experiencing
	Looking for information before deciding to visit or work at Piopiotahi Milford Sound	**Visitors:** bookings made online or in-person before travelling to Piopiotahi Milford Sound. **Workers:** accepting a job offer and completing online worker induction tool.	Travelling to Piopiotahi Milford Sound by independent vehicle (rental or private), walking track, bus, boat or aircraft.	Spending time at Piopiotahi Milford Sound at the visitor terminal, accommodation areas, cark parks, on the road, walking tracks, the jetty, and on the water.
A Independent visitors	Independent and Group visitors research and plan their trip online, using tourism websites, search engines, social media, and AI tools before deciding to visit. Group visitors may also discover Piopiotahi Milford Sound as part of a broader New Zealand itinerary, often through tour operators, travel agents, or online research.	Independent visitors book their visit directly through an operator or booking websites. They may visit an operator, iSite or DOC visitor centre to book in-person.	Independent visitors make their own way to Piopiotahi Milford Sound, typically by vehicle along the Milford Road. Some will travel by aircraft or bus.	Independent visitors spend a few hours to a full day at Piopiotahi Milford Sound — on the water, walking trails, at the visitor terminal, and in the car parks and cafe.
B Group visitors		Group visitors book a package that includes Piopiotahi Milford Sound through a travel agent, online travel agency or operator website. Includes cruise ship passengers.	Group visitors take organised transportation to Piopiotahi Milford Sound – tour buses, aircraft, cruise ships and guided walks.	Group visitors spend a few hours at Piopiotahi Milford Sound — at the visitor terminal, on the water, in the car parks and cafe. Cruise ships visit the fiord for a few hours.
C Boat users	Boat users are typically locally or regionally based and visit for recreation, or commercial purposes — often with familiarity of the area.		Most boat users travel to Piopiotahi Milford Sound by the road, launching at the jetty. Some travel directly there by water, via the Tasman Sea (including cruise ships).	Boat users typically launch at Deepwater Basin and spend time on the fiord. Commercial fishermen may load and unload at the wharf.
D Day workers	Potential workers may research job opportunities at Piopiotahi Milford Sound, using websites, search engines, social media and AI tools, before deciding to apply for a role. Some may be offered employment at Piopiotahi Milford Sound and are informed about the role, its location, and working conditions before accepting.	Workers who accept job offers to work at Piopiotahi Milford Sound will sign an employment agreement, and complete the online induction tool*. **The online induction tool is a new communication channel being developed by EMS. It is designed to support operators share consistent risk information with staff.*	Day workers commute to Piopiotahi Milford Sound, typically from Te Anau, by vehicle or aircraft, travelling the Milford Road each working day.	Day workers spend a full working day on site – at the visitor terminal, cafe or hotel before returning home by vehicle or aircraft, travelling the Milford Road.
E Overnight workers			Overnight workers travel to Piopiotahi Milford Sound at the start of their work rotation, typically by vehicle or aircraft, travelling along the Milford Road.	Overnight workers live on site in staff accommodation, working and spending leisure time at Piopiotahi Milford Sound throughout their rotation.

Communication outcomes

These describe the knowledge and awareness we want visitors and workers to gain at each stage of their journey.

They are intended to guide why and how consistent messages are developed and deployed across all partner channels.

For example:
During the considering and booking stages these focus on raising awareness of the risk and enabling informed decision-making, before they go.

During the travelling and experiencing stages these focus on ensuring visitor and workers understand how to mitigate risk, at Piopiotahi Milford Sound.

Considering	Confirming	Travelling	Experiencing
Everyone: Be aware that natural hazards exist at Piopiotahi Milford Sound Understand earthquakes, landslides, and tsunami can occur without warning Know there is a risk to life but it is very low during a short visit Understand this risk increases with time spent at Piopiotahi Milford Sound. Be aware that once at Piopiotahi there is very limited time or options to respond to a major event Consider risk when deciding to visit or as part of employment decision Know where to find more detailed information	**Everyone:** Be aware that once at Piopiotahi there is very limited time or options to respond to a major event Know where to find more detailed information **Visitors:** Receive hazard information during booking process Be reminded of warning signs and protective actions **Workers:** Receive natural hazard risk briefing during staff induction Know workplace safety and emergency plans	**Everyone:** Be reminded of natural hazards on journey Know environmental warning signs (long/strong earthquake, unusual water) Know to move to higher ground immediately, if a large earthquake or landslide occurs **Visitors:** Remember to follow staff instructions	**Everyone:** Recognise warning signs and act immediately if signs occur Remember 'LONG or STRONG, GET GONE' Know to move to higher ground immediately, if a large earthquake or landslide occurs **Visitors:** Remember to follow staff instructions **Workers:** Be able to follow and implement workplace emergency plans and procedures Be prepared for extended isolation

Communication points

These indicate where, on which channels and touchpoints, consistent messages should be applied to reach people at the right place and time.

More detail on page 7.

Considering	Confirming	Travelling	Experiencing
Websites and social media Travel agents Visitor centres Journey departure points AI tools / searches Boat and hunting clubs	Websites Operator booking sites Travel agents Visitor centres Journey departure points Worker induction tool	Visitor centres Journey departure points Visitor accommodation and sites along the Milford Road (i.e. Knobs Flat) Walking track signage	Visitor terminal Car parks and cafe Visitor and worker accommodation sites Deepwater Basin Jetty Walkways and the road

Channels

The most effective time to communicate risk information to visitors and workers is before they travel — at the considering and confirming stages — when they can make informed decisions about whether or not to visit or take up employment at Piopiotahi Milford Sound.

Digital channels

Websites, booking platforms and social media are the key channels for reaching visitors and workers at these stages. The collective deployment of consistent messaging across these digital channels will ensure visitors and workers encounter consistent, accurate information wherever they search (including AI tools and search engines).

Websites

EMS and AF8 will develop dedicated webpages to provide more detailed natural hazard risk information and the science that informs it, which other partners can link back to:

- civildefencesouthland.govt.nz/piopiotahi-milford-sound
- af8.org.nz

Members of The Collective will apply minimum viable messaging to their websites with links back to the EMS and AF8 webpages. They may also use the short-form messaging where appropriate. These include:

- DOC – www.doc.govt.nz
- MSTL – milfordsoundtourism.nz
- TNZ – www.newzealand.com
- GS – greatsouth.nz, www.fiordland.org.nz, and southlandnz.com
- Real NZ – www.realnz.com
- SD – www.southerndiscoveries.co.nz

Organisations, tourism operators and agents undertaking business and recreation activities related to Piopiotahi Milford Sound are encouraged to adopt the same consistent messaging and update their websites when possible.

Online worker induction tool

EMS will develop and host an online worker induction tool for use by operators and organisations with staff working at Piopiotahi Milford Sound. Organisations, tourism operators and businesses are encouraged to direct all new staff to complete the induction before beginning work on-site.

Booking platforms and travel trade

Booking pages, points of sale and online travel agencies are key touchpoints for visitors before they decide to visit or work at Piopiotahi Milford Sound. Organisations, tourism operators and agents are encouraged to ensure minimal viable messaging is visible at the point of booking. This could include links to more detailed information on the EMS and AF8 webpages, where appropriate.

Social media

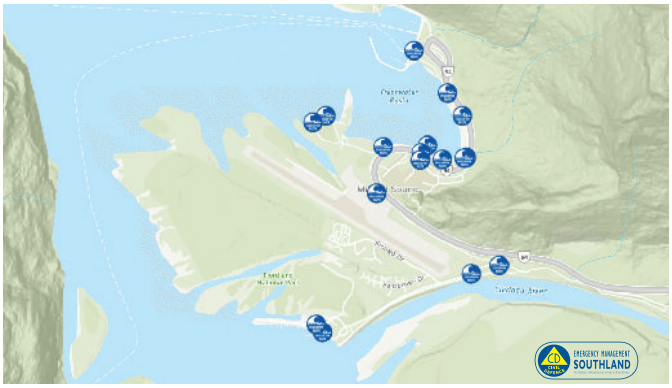
There are a number of active social media channels that reach visitors and workers before they decide to visit or work at Piopiotahi Milford Sound. Social media managers are encouraged to use the messages provided by this strategy in their social media posts, where appropriate.

Physical touchpoints

Visitor centres, printed materials, in-person interactions and signage also play an important communication role throughout the visitor and worker journey, and should be updated to reflect the consistent messaging in this strategy where and when appropriate.

Tsunami signage

EMS has installed 17 tsunami signs at Piopiotahi Milford Sound. This signage is based on the NEMA's technical standard for tsunami signage,[4] and is located at key interaction points where visitors and workers frequent during their time on-site, to remind and inform people what action to take in a tsunami.



Visitor centres

iSites, visitor information centres and DOC visitor centres in Queenstown and Te Anau are key touchpoints where visitors interact with information before they decide to visit or work at Piopiotahi Milford Sound. Organisations and operators with a presence at these centres are encouraged to ensure consistent risk messaging is available, whether through printed materials, brochures, or staff conversations.

Printed materials

Tourism operator brochures and printed collateral are an important channel. Operators are encouraged to include minimum viable messaging in printed materials aimed at visitors and workers to Piopiotahi Milford Sound. Include a link/QR code to more detailed information on the EMS and AF8 webpages, where appropriate.

Other touchpoints

Other physical touchpoints where visitors and workers interact with information – Knobs Flat, Mirror Lakes, along the Milford Road corridor, the visitor terminal, car parks, walkways, accommodation areas and Deepwater Basin jetty at Piopiotahi Milford Sound — currently have limited natural hazard risk information. As new science modelling and operational information becomes available, signage at these sites should be reviewed and updated to reflect consistent risk messaging.

4. National Tsunami Signage Technical Standard for the CDEM Sector [TS 01/08].

The Collective

This strategy has been co-developed by an interdisciplinary group (The Collective), who will lead its implementation. It recognises that effective communication of natural hazard risks requires a collaborative model, integrating knowledge from multiple fields — emergency management, tourism operators and agents, national organisations, regional agencies and authorities, global hazard risk research, and local knowledge.

The table below outlines the members of The Collective, their key audiences and stakeholders, and the communication channels they will use to begin implementing this strategy. Other organisations, tourism operators and agents, and businesses are encouraged to do the same. This will ensure visitors and workers receive accurate, consistent information at the right time and through the right channels, with messaging that reinforces rather than contradicts what they will find elsewhere.

Partners	Audiences and stakeholders	Communication channels
Emergency Management Southland (EMS) – delivers Civil Defence and Emergency Management activities on behalf of the four local authorities in Southland. EMS acts as the authoritative source of consistent risk communication information, with other organisations amplifying and targeting messages to specific audiences groups, like tourists and workers.	Southland residents and communities; Fiordland Hazards Working Group; Milford Operational Group; Te Anau-Manapouri Operational Group; Local government authorities and their workers; Emergency Management Otago; the National Emergency Management Agency (NEMA).	EMS website; EMS social media channels; Signage and printed resources; Worker induction tool; Community and stakeholder group meetings; Local government communication channels.
Department of Conservation (DOC) – the government agency charged with conserving New Zealand's natural and historic heritage. Responsibility for communicating and managing risk to acceptable levels at visitor sites in national parks and other public conservation areas.	People using DOC facilities like tracks and campsites in the area; Concessionaires in the area, including Milford Sound operators and Queenstown Milford Users Group; Other central government agencies; DOC workers.	DOC website; DOC social media channels; Signage and printed resources; DOC Visitor Centres; DOC booking system; DOC staff intranet; Media releases.
Tourism New Zealand (TNZ) – the organisation responsible for marketing New Zealand to the world as a visitor destination. It provides a conduit for official hazard information and consistent risk messaging to the tourism sector, including travel trade.	TNZ marketing audience, travel trade, travel media, tourism sector stakeholders; Isite Visitor Information Centre network;	100% Pure NZ website; Media messaging; Trade communications and events.
Great South (GS)– the Regional Development Agency (RDA) for Murihiku Southland, responsible for driving economic, social, and cultural growth to ensure the region is a premier place to live, work, and visit. It provides a conduit for official hazard information and consistent risk messaging to the tourism sector, including travel trade.	Domestic and international tourism trade; New Zealand residents and visitors; Tourism sector and regional member businesses; Southern Way Alliance, including airports; Destination Queenstown; New Zealand Cruise Association; Visitor booking agents and information centres; Te Anau and Fiordland communities.	GS websites; GS social media channels; GS e-newsletter; Travel trade and regional business events.
Milford Sound Tourism Ltd. (MSTL) – provides key visitor services and infrastructure in Piopiotahi Milford Sound, including the harbour, wharves, visitor terminal, parking facilities, accommodation for their staff and contractors, and Eglinton Valley Camp.	MSTL workers, contractors and consultants; MSTL Shareholders; MSTL concession licensed boat operators; Coach operators; Wastewater plant customers; Domestic and international visitors.	MSTL website; MSTL social media channels; MSTL e-newsletter; Piopiotahi Milford Sound Visitor Terminal; Signage and printed resources.
Real NZ (Real NZ)– a tourist operator in Piopiotahi Milford Sound.	Real NZ workers; Domestic and international visitors; Visitor booking agents and information centres; Domestic and international travel trade.	Real NZ website; Real NZ social media; Signage and booking forms; Travel trade events.
Southern Discoveries (SD) – a tourist operator in Piopiotahi Milford Sound.	SD workers; Domestic and international visitors; Visitor booking agents and information centres; Domestic and international travel trade.	SD website; SD social media; Signage and booking forms; Travel trade events.
Te Ao Marama Inc. (TAMI) – is the mandated voice of Ngā Papatipu rūnanga ki Murihiku for Local Government, environmental and resource management. TAMI is made up of representatives of the four Murihiku Papatipu Rūnanga – Ōraka Aparima, Waihōpai, Awarua and Hokonui.	Ngā Papatipu rūnanga ki Murihiku, mana whenua, mana moana, whānau, maata waka Māori, Murihiku communities and Te Rūnanga o Ngāi Tahu.	Marae, hapu and whanau, in-person hui and wānanga, and community engagement events.
AF8 Programme (AF8) – a programme of scientific modelling, coordinated planning, and community engagement, designed to build resilience to the next Alpine Fault earthquake.	New Zealand communities, particularly those in the South Island.	AF8 Programme website; AF8 Roadshow public talks.

Background

Piopiotahi Milford Sound is one of Aotearoa New Zealand's most iconic, stunning and remote visitor destinations. However, this spectacular location is also exposed to significant natural hazard risk, particularly from earthquake-induced landslides and tsunami events. While the risk of a tsunami impacting Piopiotahi Milford Sound has long been recognised, research published in 2024 and 2025 has elevated the profile of the risk they pose to visitors and workers in the area.

This research emerged within a changed regulatory landscape. The 2019 Whakaari White Island volcanic eruption, and subsequent scrutiny around whether risks were adequately communicated to visitors and workers, has raised expectations of risk transparency and how natural hazards are communicated in high-risk tourism settings – including Piopiotahi Milford Sound.

Additionally, despite the considerable hazard research that exists for Piopiotahi Milford Sound, there has been no single, coordinated source of information to guide consistent public messaging or inform decision-making across the various agencies and operators involved.

These factors have provided the catalyst for collective action, with several agencies working in Piopiotahi Milford Sound keen to understand what the new research meant in practice – both in terms of risk communication and risk management.

In 2025, Emergency Management Southland (EMS), Milford Sound Tourism Limited (MSTL), the Department of Conservation (DOC), the Ministry of Business Innovation and Employment (MBIE), Southland District Council (SDC) and the National Emergency Management Agency (NEMA) formed a Milford Working Group and initiated a multi-stage project to improve our understanding of natural hazard exposure and risk to life from tsunami hazards for both visitors and workers at Piopiotahi Milford Sound.

The overall goal of this work is to enable informed decision-making by ensuring that people visiting or working in Piopiotahi Milford Sound understand the risk posed by landslide-induced tsunami hazard, the likelihood of one occurring during a visit, and the limited ability to mitigate risk once on site.

Piopiotahi Milford Sound collective action timeline

This table summarises the activities of the Milford Working Group and other related initiatives.

From 2024	Proactive briefings on new research findings from scientists are held for key Piopiotahi Milford Sound stakeholders (EMS, MSTL, DOC, NEMA etc.). Early awareness enables the formation of a Milford Working Group to progress collective action.
Mid 2024	National Exercise Rū Whenua further raises awareness of the risk posed by a large Alpine Fault earthquake with government agencies. Based on the AF8 Hazard Scenario, it is enhanced with additional research to highlight seasonal differences, including if the earthquake was to occur during the summer peak season at Piopiotahi Milford Sound – **LINK**
Oct 2024	The Milford Working Group approaches GNS Science (now ESNZ) to understand the research, risk modelling and analysis required to quantify the risk to life landslide-induced tsunami pose to workers and visitors at Piopiotahi Milford Sound and communicate it effectively.
Nov 2024	The Milford Working Group agrees that communicating what we know now should not be delayed while new research is undertaken. Members contribute funding to commission GNS Science (now ESNZ) to undertake a scoped risk assessment based on our current knowledge (up until 2025), with an initial focus on expert advice for effective risk communication to visitors and workers.
Apr 2025	*Landslide-induced tsunami risk communication advice for visitors and workers in Milford Sound / Piopiotahi* report completed by GNS Science (now ESNZ)
May 2025	The Milford Working Group meets with GNS Science (now ESNZ) to workshop the outcomes of the advice report, clarify implications, and agree on next steps to strengthen operational coordination and coordinate risk communications.
May 2025	Emergency Management Southland (EMS) installs official tsunami signage along the shore at Piopiotahi Milford Sound.
Sept 2025	The Piopiotahi Risk Communications Co-design Group forms – The Collective. This is a sub-group of the Milford Working Group, tasked with implementing the advice and recommendations from GNS Science (now ESNZ). Te Anau-Manapouri and Milford Operational Groups formed.
Oct 2025	Milford Sound Duty Managers Group formed to establish a point of contact for information sharing during emergencies.
Mar 2026	EMS engagement and updates on this strategy to stakeholders at the Milford Sound Operational Group, and Te Anau-Manapouri Operational Group meetings. Briefings on the strategy to other tourism stakeholders and partners. Version one of the Piopiotahi Milford Sound Collective Risk Communications Strategy completed for use.

Piopiotahi Milford Sound hazard research timeline

Hazard research in the Fiordland area has evolved significantly over time. The following table summarises key hazard research, going back over 100 years, which informs our current understanding of the risk posed by landslide-induced tsunami at Piopiotahi Milford Sound.

Early 1900s	Geological mapping carried out across New Zealand, including in the Fiordland region.
1940s	Geologist Harold Wellman proposes the existence of a major fault running the length of the South Island, the Alpine Fault, suggesting a massive horizontal displacement of rock, which was a revolutionary idea before the theory of plate tectonics was established.
1960s	The global understanding of plate tectonics provided the scientific mechanism to explain the Alpine Fault's movement and the uplift of the Southern Alps.
Early 2000s	Research continues into landslide and tsunami hazards at Fiordland National Park following the 2003 magnitude 7.3, and 2009 magnitude 7.8 earthquakes in the region. Modified GeoNet description of 2003 earthquake: "The earthquake that struck Fiordland on 22 August 2003 was the largest to hit New Zealand in many years. Fortunately, the earthquake's epicentre was not near any heavily populated areas, so personal injuries and damage to property were quite minor. Closer to the epicentre, in the steep slopes of Fiordland, over 200 landslides were triggered, some of which generated small local tsunami when they hit the water. One tsunami was very localised and was generated by an earthquake-triggered sub-aerial landslide that caused run-ups of 4-5m, damaged a wharf and affected several hundreds of metres of shoreline in Charles Sound. Further offshore the earthquake raised the seafloor significantly, causing another small-scale tsunami that was recorded up the coast at Jackson Bay, and also at Port Kembla in Australia, 1,650 km away." Modified GeoNet description of 2009 earthquake: "The earthquake that struck Fiordland on 15 July 2009 was the biggest since the Buller and Hawke's Bay earthquakes of 1929 and 1931. There were no casualties, and the damage was much less than many people expected for this size of earthquake, because it pushed most of its energy to the South-West and away from populated areas. Over 300 landslides were triggered, and a small tsunami was generated by this earthquake, with the tide gauge at Jackson Bay, near Haast, recording a wave of 1 metre (peak to trough). An Australian gauge located out at sea, south-west of New Zealand, also detected a small wave sometime after the main earthquake, which may have been generated by a landslip into the sea or an undersea landslide."
Jun 2012	Research indicating there is a 30% chance of an Alpine Fault earthquake occuring in the next 50 years is published by GNS Science – **LINK**
Oct 2012	University of Canterbury PhD thesis featuring hazards at Piopiotahi Milford Sound is published, including landslide-induced tsunami hazard. It recommends further research into the risk of landslide-induced tsunami hazard at Piopiotahi Milford Sound – **LINK**
Mar 2015	Emergency Management Southland commissions a GNS Science Report to further investigate the risk of landslide-induced tsunami hazard at Piopiotahi Milford Sound, as recommended by University of Canterbury PhD thesis findings.
Jul 2016	AF8 Hazard Scenario published – The multi-agency AF8 (Alpine Fault magnitude 8) programme was initiated to develop a hazard scenario for the next major earthquake and coordinate a response plan across the South Island – **LINK**
Oct 2018	AF8 SAFER Framework published – The South Island Alpine Fault Earthquake Response (SAFER) Framework was launched to guide planning and preparedness – **LINK**
Apr 2021	75% chance of an Alpine Fault earthquake in the next 50 years published – **LINK** This change in probability means previous risk metrics for Piopiotahi Milford Sound will need to be recalculated (original metrics were based on a 30% chance, published 2012)
Late-2021	AF8 Programme engagement with operators at Piopiotahi Milford Sound to support staff inductions reiterates a need for further research into landslide-induced tsunami at Piopiotahi Milford Sound, to improve understanding of the risk and potential mitigation options.
Early-2022	Two research projects are initiated at the University of Canterbury, supported by the AF8 Programme, to improve our understanding of the risk posed by landslide-induced tsunami at Piopiotahi Milford Sound.
Oct 2024	First University of Canterbury research project is published – Harris, O. L. et al. (2024). Agent-based modelling of evacuation scenarios for a landslide-generated tsunami in Milford Sound, New Zealand – **LINK**
Oct 2025	Second University of Canterbury research project is published – Darling, M. J., et al. (2025). Minutes matter for life safety and risk exposure in Milford Sound, New Zealand – **LINK**
Early 2026	Research Stage One underway – A critical synthesis of existing research relevant to Piopiotahi, and global knowledge to date. to inform risk assessment and tsunami modelling.

References

Berryman, K. R., Cochran, U. A., Clark, K. J., Biasi, G. P., Langridge, R. M., & Villamor, P. (2012). Major earthquakes occur regularly on an isolated plate boundary fault. *Science, 336*(6089), 1690–1693. https://www.science.org/doi/10.1126/science.1218959

Charlton, D. H., Clive, M. A., Cox, S. C., Lawson, R. V., Leonard, G. S., & Jolly, G. E. (2025). *Landslide-induced tsunami risk communication advice for visitors and workers in Milford Sound / Piopiotahi* (GNS Science Consultancy Report 2025/14). GNS Science.

Darling, M. J., Robinson, T. R., Adams, B., Wilson, T. M., & Orchiston, C. (2025). Minutes matter for life safety and risk exposure in Milford Sound, New Zealand. *Scientific Reports, 15,* 36459. https://doi.org/10.1038/s41598-025-22101-3

Dykstra, J. L. (2012). The post-LGM evolution of Milford Sound, Fiordland, New Zealand: Timing of ice retreat, the role of mass wasting and implications for hazards [Doctoral thesis, University of Canterbury]. University of Canterbury Research Repository. https://ir.canterbury.ac.nz/items/1ec317fb-c9dc-4389-a95f-969606b6ea9d

Harris, O. L., Robinson, T. R., & Wilson, T. M. (2024). Agent-based modelling of evacuation scenarios for a landslide-generated tsunami in Milford Sound, New Zealand. *International Journal of Disaster Risk Reduction, 113,* 104847. https://doi.org/10.1016/j.ijdrr.2024.104847

Howarth, J. D., Barth, N. C., Fitzsimons, S. J., Richards-Dinger, K., Clark, K. J., Biasi, G. P., Cochran, U. A., Langridge, R. M., Berryman, K. R., & Sutherland, R. (2021). Spatiotemporal clustering of great earthquakes on a transform fault controlled by geometry. *Nature Geoscience, 14(5)*, 314–320. https://doi.org/10.1038/s41561-021-00721-4

Ministry of Civil Defence & Emergency Management. (2008). National tsunami signage (Technical Standard TS01/008). https://www.civildefence.govt.nz/guidance-training/guidelines/technical-standards/tsunami-signage

National Emergency Management Agency. (2025). Consistent messages. https://www.civildefence.govt.nz/guidance-training/consistent-messages

Orchiston, C., Davies, T., Langridge, R., Wilson, T., Mitchell, J., & Hughes, M. (2016). AF8 hazard scenario. AF8 Programme. https://af8.org.nz/media/yuoignpy/af8_hazardscenario-oct16-final.pdf

AF8 Programme. (2018). AF8 SAFER Framework. https://af8.org.nz/response-planning