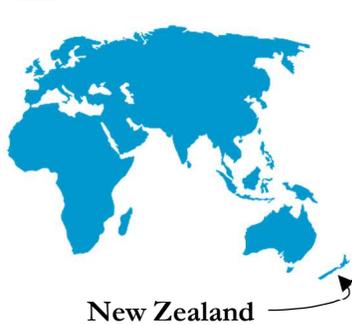


## Case Study

# Mangatepopo Drowning, New Zealand 2008

## Summary

In 2008 at a well-respected outdoor center in New Zealand, seven participants on an outdoor adventure program drowned in a flood during a canyon hike. The outdoor centre had been running for over 30 years, and had numerous safety systems in place. How could this have occurred? Investigations showed a variety of contributing factors in multiple direct and underlying risk domains.



Canyon hike

## The Outdoor Centre

The Sir Edmund Hillary Outdoor Pursuit Centre (now Hillary Outdoors) is nestled in a wilderness area next to the Tongariro National Park on New Zealand's North Island. The Centre, founded in 1972, offers a wide variety of leadership development, skills training and experiential education programs for school groups and others in multiple locations. At the time of the incident, the Executive Director, who had a PhD in Risk Management, had been working at the Centre for over 20 years.

The Centre had put a number of safety systems in place, even though the government had no safety requirements specific for outdoor adventure programs. These systems included a Safety and Crisis Response Plan, Activity Policies, a Risk Assessment and Management System (RAMS), an instructor core competency sign-off scheme, and decades of accident and incident reports. A separate Instructor

Handbook, not closely correlated with the Risk Analysis, was also available. Management were confident that safety systems were appropriate.

The organization was subject to operational challenges. There was pressure to accept client bookings even if suitable staff were not available. Despite efforts to train and support field leaders, activity leader turnover was high. The organization had a history of assigning responsibility for accidents to staff, rather than addressing underlying issues. Activity leaders frequently reported feeling overworked and disillusioned with the organization. Due to staffing issues, there was pressure to get new instructors into productive work mode as soon as possible. The instructor training and orientation (induction) system was seen by some as too brief and as inadequate. As a result, the Centre's instructors in general were seriously inexperienced.

The Centre wrote in its enrollment materials about its “highly trained instructors” with “extensive qualifications,” but this wasn’t always the case.

## Incident Description

The 10 teenagers and their teacher hiked up the narrow steep-walled canyon on a rainy New Zealand afternoon, splashing through the stream that ran between towering cliff walls. The students, all 16 years old, had come with their 29-year old teacher from Elim Christian College to the Centre for a week of team-building and outdoor adventure. Scrambling or ‘canyoning’ through Mangatepopo Gorge was an exciting opportunity to overcome fears and experience personal growth through adventure-based learning.

The plan was for the group to walk, wade, and scramble about 200 meters up the canyon, crisscrossing the stream, then turn around and return to the start. (Everyone would go hiking; the Centre did not use the philosophy of “challenge by choice,” where participants could choose to participate or not in the gorge trip.)

Staff knew to check the weather before heading out for the day’s activities. The national weather agency, MetService, provided a forecast along with a weather map, updated throughout the day, and a Severe Weather Warning email notification service. At 8 am staff reviewed the forecast, which called for rain. Checking the morning forecast was considered sufficient, so the weather map (which would have alerted staff to heavy rain) was not reviewed. Nor were updates. The Centre did not subscribe to the Severe Weather Warning service.

Unbeknownst to the Centre staff, the morning weather report mistakenly omitted the word

“thunderstorm,” which could have alerted staff to heavy rains, and MetService did not follow up to address the error in its forecast.

### *Entering the Canyon*

The expectation at the Centre was that groups would do activities “rain or shine.” So despite the rain, into the canyon they went. The water in the gorge was cold, and chest deep in places. Some students struggled. One student became frightened, began to cry, and wanted to turn back. Another student needed assistance; he had physical impairment from cerebral palsy, although this was not listed on his medical form. As they traveled, the current became stronger, and the water deeper. Near the turnaround point, one student was nearly swept away. (The medical form did not ask about swimming competence; participant swimming ability, required by Centre policy to be assessed, was not checked, nor was there any routine system to do so.) In crossing deep areas of the stream students had to jump in the water and catch the hand of someone who had already crossed.

It had been raining throughout the day, at times heavily. The water continued rising. It became brown and muddy. Travel became increasingly difficult. The group passed by a “high water escape.” A map of the gorge with emergency escapes was available, but had never been given to the instructor. Contrary to Centre policy, the instructor was never shown and familiarized with all the emergency escapes. Although she had gone through a competency-based assessment, the instructor's knowledge of the gorge was incomplete.

Unaware of the emergency escape, the group continued past it, downstream. With the exit of the canyon—and safety—just about 135 meters away, the group took shelter on a ledge to wait out the flood.

The Centre's Crisis Management plan identified floods as a threat, but did not provide specifics or strategies to address the flood situation that was unfolding. Back at the office, program managers noticed rising waters in the gorge. But they did not at that point initiate the Crisis Management Plan.

### *Trapped on a Ledge*

The water kept rising. It came over the ledge. It covered students' ankles, then tugged at their knees. The ledge was slippery, and students had to hold onto the rock face to avoid being swept away. The instructor wasn't sure what to do. She had been at the Centre only three months. She had never seen the river in flood. She had not been formally assigned a mentor, who could provide safety guidance, as described in the Centre's policies. (In fact, the described mentoring system did not appear to be in place.) She had been permitted to lead the Gorge trip without having read and signed the Risk Analysis and Management System document describing Gorge risks and management strategies, as required. And while the Risk Analysis document had some information, it was incomplete. She had no way of knowing if the water would continue to rise.

The instructor tried radioing for help, but the radio was turned off, disassembled, and double-bagged, making communications to or from the group more difficult. When she finally was able to make the radio operational, the canyon walls blocked her call. A radio repeater installed at the mouth of the canyon would have solved this problem, but no such device was installed. The students were cold and uncomfortable. The instructor faced an extraordinarily difficult situation.

(Although the instructor didn't know it, in 1976 a girl on a Centre trip in the gorge was swept away and drowned. Over the years other

incidents occurred where students were swept away by the current or trapped on a ledge due to rising water. However, these and additional incidents were not effectively communicated to staff to be used as learning experiences.)

### *The Escape Plan*

The water was now a roaring, raging torrent. The instructor explained her escape plan: she would jump in the river, swim downstream to safety, and every five minutes group members would follow, where from shore she would toss them a safety line with her throwbag and pull them to shore. The noise of the water was overwhelming, so she told her plan to nearby students, and tried to lip read as the teacher explained it to others farther along the ledge.

Some students were not confident in the water. The instructor knew some students would not make it alone, so she clipped them with webbing and carabiner to stronger swimmers, including herself.

The instructor courageously jumped into the water, floated through the torrent, and made it ashore just above a dam. A student soon followed, but came down the far side of the stream, out of reach of the instructor's throwbag. He was swept over the dam. He hit a log and rocks, lost his helmet, both boots, and a sock, but was able to get to shore.

The instructor told the student to get her radio and call the Centre for help, which he did. But radio procedures regarding which channels to use were unclear to rescuers, leading to confusion and inefficient communications. And rescue drills practicing rescuing groups in the gorge had not been conducted. Although program managers made sincere efforts to help, they did not at any point effectively implement the Crisis Management Plan.

### *Tragedy Unfolds*

Another student floated by, calling for help. But he was too far away to reach, and was thrown over the dam. The student's body was later found downstream.

Since only one radio was present with the group, communications—such as how to swim downstream to be closer to the throwbag—were made impossible, once the group split up. Having only one instructor leading a trip in challenging terrain compounded the problem. This had been an issue with previous incidents as well.

Other group members followed the first student. But they were unable to reach or keep hold of the throwbag. Within five minutes, six students and their teacher drowned. Bodies of two students were recovered more than two kilometers downstream.

An external safety audit was being conducted on the day of the tragedy. Remarkably, despite the death and the many issues leading to it, those issues were not addressed in the external review, and the Centre passed its safety audit.

