

# **WEST COAST RIVER FLOOD HISTORY 1846 - 1989**

*Compiled by John Benn for the West Coast Regional Council*

## 22 FEBRUARY 1846

Heavy rain for a week raised the Buller River and hindered Thomas Brunners' exploration of the Buller Gorge, Brunner commented, "I find some parts of this at a fresh the river rises upward of 30 feet (9.1m)". (Brailsford 1984)

## 4 - 11 MAY 1846

Torrential, almost continuous rain fell for a week, being accompanied by a north-east gale. Rain on the night of the 4th brought flood waters down from hills above Okiri (near Nine Mile) and surface water flooded Charles Heaphy's campsite. On the 5th, Heaphy and company tried to cross the Totara River but couldn't due to it being in high flood. The Totara River remained in flood until the 11th, along with other streams and creeks in the area (Heaphy 1846).

## 11 - 14 JULY 1846

The Karamea River was in flood, halting Heaphy's progress northwards for three days (Heaphy 1846).

## c5 JANUARY 1847

During Thomas Brunner's expedition, the Turaumea River was recorded as being in flood. A flax raft had to be made to get supplies to the other side whilst the people swam behind the raft (Matthews 1957).

## 23 MARCH 1847

Torrential rain raised the Buller River hindering Brunner's progress back to Nelson (Matthews 1957).

## 19 SEPTEMBER 1859

A large flood in the middle reaches of the Buller Gorge was recorded by John Rochfort, a pioneer surveyor. He noted the river in most places contracted to so links (10m) and of great depth - the fresh rose upwards of 60 feet (18.2m) in the Gorge (Brailsford 1984).

## MID JUNE 1860

The Buller was in light flood when explorer Rueben Waite arrived, but rose steadily during the day as heavy rain fell. The river overlapped its banks, stranding Waite's exploration for four days (Halket-Millar 1959).

## c25 DECEMBER 1861

Previous days of rain spoiled the first Christmas party on the Coast as creeks in the Buller region rose to even higher levels than during the winter storms (Halket-Millar 1959).

## (DAY UNKNOWN) APRIL 1862

Samuel Mackley, returning to the Grey River mouth from Waipuna after setting up Westland's first farm, was hindered by a severe flood in the Grey River. All of the flat land in the middle reaches of the river was flooded, and at the mouth the land cleared by Maoris was about two metres under water (Halket- Millar 1959).

(DAY-MONTH-UNKNOWN) 1863

Although the business district of Westport was flooded from the Buller little else is known (Nolan 1976).

(DAY UNKNOWN) FEBRUARY 1863

The Buller River was in flood, being very turbulent and creating waves "several feet" high at the rapids, making transportation of goods and supplies to gold settlements upstream difficult and dangerous (Halket-Millar 1959).

6 MAY 1863

The Arahura River was in flood and the Taramakau River was in high flood. George Whitcombe and Jacob Louper exhausted after crossing the ranges from Christchurch, managed to cross the Arahura but Whitcombe drowned whilst attempting to cross the Taramakau (Halket-Millar 1959).

AUGUST 1863

Storms swept the Buller Region throughout August and the hilltops were coated with snow for the greater part of the time, the (gold) diggers working in appalling conditions were often washed out of their primitive encampments as creeks gushed down in high flood (Halket-Millar 1959).

SEPTEMBER 1863

The same series of storms continued from August with the same consequences for the diggers' settlements (Halket-Millar 1959).

26 DECEMBER 1864

Heavy rain in the hills caused the Okitiki (Hokitika) River to rise unexpectedly. The river washed away miners shacks and supply stores on the south side of the river (Halket-Millar 1959).

(DAY UNKNOWN) JANUARY 1865

Hokitika as a town had only just opened up when a flood all but submerged the place (Halket-Millar 1959).

(DAY UNKNOWN) APRIL 1865

Three Mile Creek (near Hokitika) was in a state of fresh and one man drowned whilst trying to cross it (Halket-Millar 1959).

c23 MAY 1865

The Hokitika River was in flood and the steamer Wakool sank trying to enter the river as the current was very strong (Halket-Millar 1959).

OCTOBER 1865

The Grey River was flooded for much of October claiming a number of victims - many being swept out to sea. Where the Arnold River joins the Grey, miners were trapped on several occasions (Halket-Millar 1959).

OCTOBER 1865

Very heavy rain on Sunday night (1st) brought the Hokitika River into flood on Monday morning (2nd). A large amount of debris was brought down the river which overflowed its banks at Hokitika township. Water reached the stores along Gibson Quay. Tancred Street looked like a canal and water ran up Weld Street, ponding up like a lake. The whole of the river beach on the

Greymouth side was submerged, and the velocity of the water threatened to tear vessels from their moorings. The volume of water running through the mouth channel at the south spit was reported to have been the largest seen. Although the rain was heavy, it was not considered intense enough in itself to raise the river so suddenly. It was therefore thought that the warm temperature (13 C) melted a lot of snow in the high country. (W.C.T 03/10/1865)

#### 20 OCTOBER 1865

The weather had been very changeable for a week bringing rivers and creeks into flood. On the 20th, a fresh in the Grey River broke a coal boat loose from its mooring, capsized it and swept it down to the river mouth. The boat was eventually recovered. (W.C.T 26/10/1865)

#### 27 OCTOBER 1865

James Smith, a popular Cobb and Co Coach driver was drowned in Saltwater Creek near Paroa. He attempted to drive the coach across the creek in high flood and was swept away. The Coach and a considerable amount of property was also lost. (W.C.T 28/10/1865)

#### 20 - 24 DECEMBER 1865

Rain fell over the whole West Coast for a number of days, being heavier in the north. All rivers between the Grey and Hokitika were in flood; the Taramakau being so high as to be impassable. Mail deliveries too and from Hokitika were suspended for three days because of the Taramakau level. A large amount of mail was lost in the Arahura River when the delivery person tried to cross from the Greymouth side. (W.C.T 23/12/1865).

At 9.00 p.m. on the 24th the Taramakau overflowed its banks, burst through the north tip and washed away a small village there. Except for a small amount of property, all was lost. More could have been saved but for the rapidity with which the river encroached on the bank and widened the new channel.

At Hokitika a fierce north-west gale with heavy rain commenced on the 23rd and continued unabated through at the 24th. The Hokitika River in high flood, backed up against the high tide and flooded much of the lower part of Hokitika. Boats were needed to travel around the town and the water rose so fast many people prepared to be evacuated. At 8.00 p.m. on the 24th at low tide, the surface of the river was less than a metre from the highest part of the wharf. The lower end of Gibson Quay was damaged the most as the river encroached 6m into the roadway and washed away the entire wharf section of that area. On Christmas Day, the flood had retreated somewhat but many buildings along Gibson Quay had to be moved or demolished and streets had to be cleaned up as much debris was strewn about. (W.C.T 28/12/1865).

#### 21 - 22 JUNE 1866

A strong gale blew over the region during the day and night accompanied by incessant rain, bringing most river into flood. The streets of Hokitika were almost impassable as they were transformed into deep muddy bogs and unmade thoroughfares became completely swamped with water. Although a moderately heavy freshet was flowing in the Hokitika River on the 21st, no damage was caused. On the 22nd the Taramakau River was unusually high, and combined with a very heavy surf, made it completely impassable. (W.C.T 26/06/1866).

#### 26 - 27 JUNE 1866

Three days of gale force winds and heavy rain from the north west, and warm temperatures lead to snowmelt in the high country, raising the levels of most rivers. Severe flooding occurred in Hokitika and Greymouth. (G.R.S 29/06/1866).

Hokitika was completely flooded by surface water on the 26th. This flooding was attributed to poor drainage which many citizens thought could have been fixed at very little expenditure. (W.C.T 27/06/1866). On the 27th "one of the smartest showers ever witnessed on the West Coast fell for half an hour". Several streets were flooded all day and boats had to be used on several occasions to allow people access to and from their homes. (W.C.T 28/06/1866).

The Grey River rose quickly and unexpectedly, and backed up against the high tide, overflowed the Greymouth banks at about 8.00 a.m. on the 27th. Water flowed down Boundary Street and into the lagoon, flooding much of Greymouth and Blaketown. Mackay, Boundary, Arney and Gresson Streets were all under "several feet" of water and at the lower end of Richmond Quay, there was about 1.5m of water in the houses, which were themselves built on 1.5m piles. Boats were needed to travel around the centre of town and at the end of Werita Street, a boatman was swept away over the bar and drowned.

A great loss of property was reported from the upper Grey Valley townships, particular at Twelve Mile. At 6.00 a.m. on the 27th, the river at the town was bank high and by forenoon the lower part of the town was flooded with 1.5m to 2m of water. Goods in stores had to be boated to higher ground, or as in many cases were destroyed by water. The Camp Reserve was reported to be completely submerged also. (G.R.A 29/06/1866).

#### 23 - 25 FEBRUARY 1866

A fortnight of excellent weather was broken by thirty six hours of almost continual rain. Much of Hokitika was flooded by surface water.

The rain commenced on the 23rd; the Hokitika River rose rapidly and was soon overflowing the sandflats on the southern side of the channel. At 8.00 p.m. the river was only 60cm lower than when it overflowed the wharf on Christmas Day 1865. The rain increased in intensity throughout the 24th and eventually ceased at 6.00 a.m. on the 25th. However, the flood peaked occurred some hours later in Hokitika.

It was noted that "no preceding flood had committed so much havoc in so short a time". This was accounted for by the construction of a dam on the southern channel which pushed the water over to the unprotected parts of Gibson Quay on the north bank. Along the length of the Quay, its width was reduced by 3m to 9m in places as the bank eroded away. Many buildings along the Quay were destroyed as they became undermined, and the dam on the southern channel was almost totally destroyed. (W.C.T. 26/02/1866).

#### 28 JUNE 1866

Greymouth and Hokitika were flooded. Gale force winds blew from the north- west and temperatures were much higher than the previous month, leading to snow-melt and heavy rainfall in the high country. The flood waters were backed up by high tides and overflowed the Greymouth banks at 8.00 a.m. A large percentage of Greymouth was flooded. Mackay Street, Boundary Street, Arney Street and Gresson Street were all under "several feet" of water and at the lower end of Richmond Quay, there was about 1.5m of water in the houses, which were themselves built on 1.5m piles.

At Twelve Mile, the lower part of the township was under 1.5m to 2m of water. One person was drowned at Greymouth, being swept out to sea. A great loss of property was reported in the upper river townships although no details are given (G.R.A. 29/06/1866).

30 JULY 1867

The departure of the coach from Hokitika to Christchurch was postponed for a day on account of the rivers being high after several days of unsettled weather. (W.C.T 31/07/1867).

1 - 6 OCTOBER 1867

A week of stormy weather resulted in most rivers and creeks rising to flood levels. Showers began to fall on the morning of Tuesday 1st. By afternoon the rain had increased to a continuous downpour accompanied by a north west gale, and lightning at nightfall. The Hokitika River began to rise as snow on the ranges melted. (W.C.T 01/10/1867).

During the next day, thunder and hail storms prevailed. The Hokitika River hadn't risen as much as expected, but was still high enough to give the bar a good scouring. The coach driver reported the Arahura River was rising rapidly, but the Taramakau was dropping. (W.C.T 03/10/1867). A man was drowned in Wainihinihi Creek, a tributary of the Taramakau whilst trying to cross it in flood. (W.C.T 04/10/1867).

By the 4th, the Arahura was excessively swollen, rising to with a metre of the roadway on the bridge, and flooded the approaches so much that the Greymouth coach had to turn back to Hokitika. The Hokitika-Christchurch coach was also delayed for a day. (W.C.T 05/10/1867).

Torrential rain on the 5th caused severe surface flooding in Hokitika. (W.C.T 07/10/1867) and by the 6th the Arahura River was still running very high, but other rivers had fallen. (W.C.T 06/10/1867).

25 OCTOBER 1867

Heavy rain began to fall on the night of the 24th. By midnight the rainfall had become torrential and continued in such a manner until just after 8.00am. Showers nevertheless continued throughout the day.

The Hokitika River rose rapidly and by day break it was in a state of 'tremendous fresh'. The flood peak and high tide occurred simultaneously, and the backwater from the river flooded every creek in the vicinity of the town. The creeks overflowed, inundating streets and dwellings. By 7.00 am water many centimetres deep laid in Hamilton, Tancred, Sewell and Weld Streets and along Gibson Quay. Some houses in north Revell Street were flooded to a depth of 60cm, although no material damage was caused. By 11.00am the flood began to subside allowing people to return to their homes and by evening the river had gone down sufficiently to allow water from the streets to drain away.

All rivers inland were very high. The coach from Hokitika to Greymouth was unable to cross Saltwater Creek as the bridge was overflowed and a portion of the tramway was washed away. (W.C.T 26/10/1867). Rivers were still high on the 26th but were dropping. (W.C.T 28/10/1867). The flood in Hokitika was the biggest of the year. (W.C.T 26/10/1867).

5 - 6 NOVEMBER 1867

The weather had been unsettled for a number of days (W.C.T 06/11/1867), and on the night of the 4th, heavy continuous showers commenced, lasting well into the night of the 5th (W.C.T 07/11/1867). Although the Arahura River was high on the 5th, preventing the coach to cross for Christchurch (W.C.T 06/11/1867), and the Taramakau was in flood on the 6th (W.C.T 07/11/1867), it was the Grey River that was most severely affected. The Grey River rose to

such an extent that it was considered the highest flood in the memory of the oldest white person on the coast, and many of the old established Maoris in the area.

At daybreak on Wednesday 6th, the river was running bank high, and by 10.00am the water was flowing over the south bank, and flooded to a great volume along Boundary Street and to the lower portion of Greymouth. Many people had to be evacuated in boats. High tide at 5.00pm increased the height of the flood (G.R.A 07/11/1867). Nearly the whole length of the costly embankment that had only just been completed was destroyed - the lower portion of the work was first to give way at high tide. From the lower end of the Wharf about 200m of protective planks had been forced inwards towards the river, in some places lying almost horizontally. Further along another section was completely destroyed and washed away, whilst the upper section of the Wharf was greatly loosened. The current scoured a deep channel in the gravel where the piles were driven (W.C.T 11/11/1867). By 5.30pm the whole of the lower end of Greymouth and Blaketown had been flooded with mud and water (H.E.S 07/11/1867), with many buildings being torn off their foundations and washed away (W.C.T 07/11/1867). The bridge between Blaketown and Greymouth was swept away, isolating the two towns, and in Greymouth sandbags were used to try and stop water entering businesses (G.R.A 07/11/1867).

Up the Grey Valley damage was equally severe. At Twelve Mile township, all buildings were more than half covered with water - many being destroyed along with vast quantities of goods. All horses, cattle and sheep in the area were lost. A store was swamped and a bridge washed away at Redjacks, and at Nelson Creek a store, hotel and goods were lost. A similar fate happened to Blackball. Two houses were swept away at the junction of the Arnold and Grey Rivers, as was the bridge near the Omoto racecourse. Many landslips occurred along the road between Greymouth and the Arnold River, and Coal Creek Flat was completely submerged by floodwaters. Two cases of drowning were reported; a boy at Coal Creek and a man at Nelson Creek (W.C.T 11/11/1867). By 8.30pm the water had fallen 15cm in Greymouth.

"The most singular feature of this visitation is that it appears to have been quite local. The driver of Cobbs coach rode out in the morning and returned from the Taramakau in the afternoon with the mail, and reports that no flood had occurred at Hokitika, and that the immediate creeks and rivers were not of unusual volume...The only explanation of this...is that either the rainfall has been confined to the watershed of the Grey, or that Lake Brunner has forced some unaccustomed outlet." (G.R.A 07/11/1867).

NOTE: From the end of December 1867 and throughout much of January 1868, most rivers and creeks were in a state of almost continual flood. The dates given below are flood peaks within that period which resulted in damage, loss of life and general inconvenience.

28 DECEMBER 1867

A man mooring a boat on the bank of Waimea Creek at 9.00pm, was swept away and drowned when a sudden heavy fresh came down the creek; heavy rain had been falling for most of the day. (W.C.T 30/12/1867).

30 DECEMBER 1867

The second day of the Hokitika Races was postponed as rain during the night raised the Hokitika River to the extent where horses wouldn't cross it to reach the track. (W.C.T 01/01/1868).

31 DECEMBER 1867 - 14 JANUARY 1868

Greymouth, Westport and Hokitika suffered from severe flooding during this period. The four days of weather between the 30th December and the 2nd January were considered the most violent and worst in Greymouth's history. Very heavy rains, thunder and lightning prevailed.

Greymouth was flooded on three occasions when the Grey River overflowed its banks and poured down Boundary Street inundating the lower portion of the town. In the first case on the 31st little damage occurred. Before daylight on the 2nd the river again poured down Boundary Street. Flood levels were nearly as high as in November 1867. Houses were flooded and damage occurred right down Arney and Albert Streets, and the new tramway was almost completely destroyed. The river bank opposite the Maori settlement eroded so quickly it was feared the buildings would fall into the river. About 7.5m of road opposite Arney Street, and between 3 and 4m of road along Mawhera Quay was also eroded away. In some parts along the Quay, only 4.5m width remained between the river and the footpath. Saltwater Creek, in high flood washed away 2/3 of the bridge; the gap directed the current towards the bank which was rapidly eroded and threatened the township. (W.C.T 06/01/1868).

On the 7th the river flowed down the channel in Boundary Street, cut by the large flood of the 2nd, making communication between Greymouth and Blaketown almost impossible. It was thought four men were drowned at Redjacks, trying to stop a waterwheel from being washed away. (W.C.T 08/01/1868) and a man was drowned at Seven Mile Creek while trying to cross it in high flood on the 1st. (W.C.T 06/01/1868).

Westport suffered its worst flood to that date, after a week of heavy rain. Mining claims at Mohikinui and other places were inoperative as shafts were swamped and some completely destroyed. Communications to small settlements was suspended as the Buller and other rivers were impossible to pass. At 6.30am on the 2nd, a large tree floating down the Buller River struck the Woodpecker Wharf at Westport and carried it completely away. The mass of the structure floated downstream, hit the new Government Wharf under construction and totally destroyed that in a few minutes. The Custom House Wharf was also badly damaged. The north bank of the river, near the new sawmills and stores was washed away to a depth of about 6m; a number of huts and wharves upstream of sawmills were also washed away. This damage was estimated at 4500. On the south side of the river a large shingle bank was 'thrown up' partially filling in the channel formed by the islands. Consequently the river changed course, flowing to the north, and washed away the bank south of the bonded stores. Wharves on this side were also destroyed. The river fell during the night of the 2nd, and by the 3rd the weather had cleared. Apart from a small section of the north bank being washed away, no more damage occurred. However, steamers in the Buller Lagoon couldn't discharge goods due to the level of the river and the state of the wharves. (W.C.T 06/01/1868).

Heavy rain on the 2nd brought the Hokitika River into high fresh. Deep drains in Tancred and Weld Streets overflowed flooding the streets.(W.C.T 03/01/1868). The river remained high until the 8th as heavy rain continued. The north river bank eroded, endangering houses at the extreme south of Beach and Revell Streets. The Wharf Hotel was washed away and the protection work at the end of Revell Street was seriously breached, placing two other hotels in danger. After a night of heavy rain on the 5th, the streets of Hokitika were again flooded on the morning of the 6th. During the day however, the river dropped and the streets dried out quickly.

Between the 8th and 13th the rivers were still above normal level, although most had dropped considerably. Coach services between Greymouth - Hokitika and to Christchurch were delayed on several occasions as the rivers were impassable - particularly the Arahura and Taramakau. (W.C.T 08-15/01/1868).

On the 14th, a fresh in the Grey River overflowed the banks, resulting in a small amount of water flowing down Boundary Street. The river bank at the lower end of the township was eroded quite badly in some places: The main body of the current diverted down an old channel from Snag Falls flowed close to the bank and undermined it. (W.C.T 17/01/1868).

#### 19 - 21 JANUARY 1868

On the night of the 19th the Hokitika and Arahura Rivers were in high flood. In Hokitika bad erosion of the river bank between the spit end and Wharf Street occurred - the width of Gibson Quay was reduced 6m in places, which threatened the Kaniere Tramway. The Arahura settlement was reported to be 30cm higher than previously recorded. (W.C.T 21/01/1868).

Heavy rain on the night of the 18th and most of the 19th, brought the Grey River into high flood on the 21st. A stream flowed through the gap in boundary Street and boats were needed to transport people from one side of town to the other. Over 3m of embankment was eroded away from the lower part of the township. Coach services were again interrupted due to high river levels. (W.C.T 22/01/1868).

It was after the flooding in January that "The Greymouth Borough Council first came into being as a result of the fear of the flood menace from the Grey River". (Jackson 1968).

#### 12 - 26 MAY 1870

Most of the area around Inangahua was flooded for a fortnight before the 26th. For several days traffic was entirely stopped as the road was blocked by trees, several slips and a bridge was washed away. One man was drowned at Inangahua and two men were stranded on an island near the township for two days. Food had to be thrown to them in a boot attached to a line to stop them from perishing in the cold. Another man was trapped between Blackwater and Little Ohika for three days. (W.C.T. 28/05/1870) At the Nile River, a man and his horse nearly drowned whilst trying to cross it in a state of fresh. (W.C.T 27/05/1870))

#### 8 - 9 FEBRUARY 1872

Heavy rain had been falling for upwards of a week, and continuous rain for a period of thirty six hours began to fall on the night of the 7th. All West Coast rivers and creeks reached major flood levels the next day (W.C.T 09/02/1872).

By the 9th the first recorded 'great flood' occurred in the Grey River, and at its peak most of Greymouth was inundated (Jackson 1968). A high sea made matters worse as the flood waters



were prevented from draining away and consequently backed up; the lower end of the town soon became submerged, and with the continued rain the river rose rapidly, breaking through the primitive protection works, carrying away all before it. Richmond Quay suffered most severely; whole blocks of offices, shops and other structures were undermined and washed out to sea. From Johnston Street to Arney Street, the river carried away everything before it, and it was estimated that no less than seventy buildings went over the bar and were smashed by the sea. The new Borough protection works - piles, planks and fascines had disappeared and the river flowed through where once stood the business district of the town. At the other end of the town the protection works and wharf were severely shaken, and considerable erosion took place opposite Custom Street. A boy was drowned in one of the houses that was washed away. News of the disaster reached the premier, Sir William Fox, who authorised immediate construction of a stone training wall between the northern end of the Cobden traffic bridge and Tainui Street, at a cost of 5000 (Lord, 1928).

The brewery at Nelson Creek was surrounded by water and the brewery opposite the Ahaura was demolished. The Totara Flat tramway and stores disappeared and a building at the Mawheraiti Junction was washed away. At Twelve Mile Creek the store, Bigswoods Hotel and others were inundated. Heavy stock losses occurred at Molloy, Bigwood and Campbell, and two houses were carried away at Camptown.

The highest flood in European times occurred in the Buller River. On the 8th, the river rose rapidly during the day, and by nightfall was overflowing its banks. By the next morning the force of the current was deflected by Garden Island towards Westport. Stanley Wharf, the National Hotel, a large two storey building and a store were swept away. The river commenced to scour the bank at the rear of the protective works at the foot of Gladstone Street, and with alarming velocity the narrow strip of roadway and ground that the National Hotel was on, gave way. The river changed course and cut a new channel through the north spit, thus making it an island. A slaughter house, a piggery, a skinyard and tools on the spit were completely washed away causing damage of approximately 400. (W.C.T 10/02/1872).

The Hokitika River was in high flood on the 8th, although the level dropped considerably during the same day. However, surface water in the lower part of the town remained until late night. (W.C.T 09/02/1872).

The township of Greenstone (in the Taramakau Catchment) entirely disappeared and the approaches to the Greenstone Bridge were swept away for 4m each side. The culvert at Kumara Junction was washed away as were huts at Maori Point. At Cassidy's old store, a trench over 20m wide developed and the approaches to the New River bridge were destroyed. (Hawker, 1977).

Note Estimates of levels in the Grey and Buller Rivers can be made. The original specifications for the Taylorville swingbridge (W.C.T ) state that the base of the bridge to be built 8ft (2.4m) above the 1872 flood level and about 30ft (9.4m) above normal - hence at Taylorville the river was about 22ft (6.7m) above normal.

At the peak of the flood, some water from the Buller River flowed down the Orawaiti River. (W.C.T 10/02/1872). To do this the Buller must rise at least 8.5m (W.C.B data) at Te Kuha.

31 DECEMBER 1873

A strong fresh in the Hokitika River prevented a rowing regatta being held. No damage was reported (W.C.T 01/01/1874).

7 MARCH 1874

A heavy downpour flooded Hokitika streets with surface water. The flooding was attributed to culverts being too small (W.C.T 09/03/1874).

Waimea Creek was reported by several people to have had its greatest ever flood, causing damage to water races and private gardens (W.C.T 14/03/1874).

4 - 6 APRIL 1874

Continuous rain began to fall on the night of the 4th containing some very heavy falls associated with strong north east gales (W.C.T 06/04/1874). All rivers were in flood.

The Buller River at Inangahua Junction rose 9.1m in twelve hours, on the 5th (W.C.T 14/04/1874). About a metre of water flooded the streets at Reefton and many houses were inundated (W.C.T 11/04/1874). Many mining claims in the Charleston district were damaged and the Nile River bridge was completely washed away. (W.C.T 13/04/1874).

In the Grey River valley, soundings taken in the Brunner Gorge indicated the flood level was about 60cm lower than the 1872 flood (W.C.T 11/04/1874). Cobden suffered considerably as much of the river bank was washed away, leaving many buildings in a dangerous position. A meeting held after the flood, proposed "that the Government be requested to appropriate the sum of 500 for the formation of the Cobden protective works. Two large reservoirs in the second right fork of Duffers Creek burst their banks, sending a wall of water down the main channel which swept away everything before it (W.C.T 13/04/1874).

On the morning of Sunday 5th, many low lying parts of Hokitika were flooded. Gibson Quay, Hamilton, Tancred, Sewell, Fitzherbert and Hampden Streets were flooded to a depth of up to a metre, and many outbuildings were washed away. In many places the river was as high as had been previously experienced.

Damage throughout Westland in general was light, despite the high river levels (W.C.T. 07/04/1874).

5 - 6 JULY 1874

Strong winds, rain, thunder and lightning centred on the up country districts overnight. Rivers and creeks rose rapidly and "the Ahaura was never known to increase in volume in such a short time as it did on Monday afternoon"(6th).

The weather was exceptionally warm, melting snow which had recently fallen in the ranges. The Greymouth coach was stranded at Twelve Mile Township, not being able to cross the swollen No Town Creek. Traffic was able to resume on Tuesday morning. (W.C.T 09/07/1874)

25 AUGUST 1874

Heavy rain fell for most of the day over much of the West Coast, and very strong winds were recorded in the Hokitika area. "The wind commenced from the N.N.E in the morning, and as the day advanced it increased in violence, until it culminated at about two o'clock in a hurricane".

The Hokitika River was in strong fresh, and at high water a strong northerly set of the sea dammed up the water greatly. This resulted in Hamilton Street and parts of Weld and Tancred Streets being flooded - Hamilton Street being the worst. Water also entered Fitzherbert Street and surrounded the Post Office. No damage was reported. (W.C.T. 26/08/1874)

#### 7 SEPTEMBER 1874

Quite a flood occurred in the Arahura township owing to the high tide backing up the fresh in the river, to such an extent that people could not travel along the road in vehicles or on horseback. (W.C.T 08/09/1874)

#### 8 SEPTEMBER 1874

The Buller River rose 6m and the Ohika and Blackwater tributaries rose 9.1m after a prolonged period of rain. No damage was reported. (W.C.T. 14/09/1874)

#### 26 - 29 SEPTEMBER 1874

Heavy rain fell for forty eight hours, between Saturday 26th and Monday 28th over much of the Coast, bringing widespread flooding. The rain was accompanied with strong winds, sleet and hail.

The major rivers were in high flood. The lower part of Westport and a section of the new railway line was flooded by the Buller River, but no serious damage was reported. The Nile and Cosmopolitan races were carried away and Thompson's Dam, in which a large quantity of water was stored in the creek below Haines Dam, broke away. At Charleston, a large landslip fell on the crushing plant of the Maori Chief Company, totally destroying it.

The Grey and Hokitika Rivers were bank high on the 27th and 29th respectively. In Greymouth the recently constructed protection works functioned well, although a portion of the town was submerged. In Hokitika, only a small amount of surface flooding occurred in the lower lying streets. No significant damage was reported from either town. (W.C.T 29/09/1874).

The Arahura River was in high flood on Monday 28th and Tuesday 29th, making it impossible to ferry people across. The spell of bad weather in September hindered bridging and road repairs. (W.C.T 30/09/1874)

#### 29 SEPTEMBER - 2 OCTOBER 1874

The winter was one of the mildest recorded in Westland but spring was the opposite. Wet conditions prevailed for the previous month; the last three days of continuous rain were reported to have been the heaviest for three years. However, snowmelt was the initial cause of rivers rising.

All rivers were reported to be in flood, their carrying capacities tried to the utmost limits. The Totara River was running bank high and Donnelly's Creek flooded a large area. An abutment to the suspension bridge at Donnelly's Creek was undermined and Jones' storm channel was running flush with the top board. Many mining operations were at a standstill.

The level of the Hokitika River caused a three day delay in the southward mail, and flooded rivers south of Ross made many bluffs impassable (W.C.T 02/10/1874).

#### 2 NOVEMBER 1874

Hunter and Party on Jones' Flat had much trouble with surface water entering a shaft after a nights heavy rain. A shaft had to be driven into old ground to let the water escape (W.C.T. 02/11/1874).

#### 20 NOVEMBER 1874

Jones' Flat storm channel overflowed its banks and water entered back premises of the Westland Hotel and a house, flooding the floors.

Up to three stays in the channel were washed away, a race was damaged and two drains were filled by a slip. A portion of the Kaniere Road was washed out at Donoghues (W.C.T 23/11/1874).

#### 4 - 5 NOVEMBER 1877

The Buller River was in high flood although little is known of flood damage caused (Cowie 1957).

At Lyell, the Buller rose 18.2m (60 feet) above normal. At Reefton the flood in the Inangahua River peaked between 1.00 a.m. and 5.00 a.m. on the 4th and came within 30cm of the 1872 flood level. No great damage was reported except that a large section of the road to Greymouth was washed away near the Reefton Saddle. (W.C.T 06/11/1877).

#### 22 - 25 DECEMBER 1884

After ten days of incessant rain (W.C.T. 26/12/1884) river levels in Westland rose. By the 23rd the Grey River was running bank to bank after being in a state of fresh the previous day. The river was running very swiftly and pouring out in a volume up to a metre above the adjoining sea water. The S.S. Star of the South was wrecked while trying to cross the bar on the 23rd. (G.R.A. 23/12/1884). The Taramakau River was in flood on Christmas Day, stranding the coach from Christchurch to Greymouth (Jackson 1884).

#### 6 - 7 NOVEMBER 1886

Gentle rain fell on Saturday 6th, but became very heavy during the night. Strong winds also prevailed. these conditions lasted right through until the night of Sunday 7th.

The Hokitika River was in high flood, and combined with high tide, flooded low lying parts of Hokitika (W.C.T 08/11/1886). During the next day, the river was running bank high all day, leaving six people stranded on an island.

The Arahura and Taramakau Rivers were also in high flood. At Arahura, severe erosion of the river bank occurred which threatened the Maori Settlement. the Taramakau was so high it prevented the cage tramway from operating, thus delaying the mail from Greymouth (W.C.T 09/11/1886).

#### 4 OCTOBER 1886

Heavy coastal rain produced a slight fresh in the Hokitika River, and parts of Hokitika town were flooded by surface water. Complaints were made that gratings in the drainage system were not cleared to allow the water to escape. (W.C.T 06/10/1886).

#### 13 NOVEMBER 1886

Severe damage occurred to roads and telegraph lines in the Taramakau district as a result of floods and slips. At Rocky Point a slip came down, covering the road for 40m, carried away seven telegraph poles and pulled several others out of line. Both telegraph wires were buried in the Taramakau River bed for a distance of 60m.

Several creeks on the line of the road were scoured out to 3m deep and 6m wide. At the Taramakau Bridge new dolphin piers had to be placed and approached rebuilt at a cost of between 700 - 800. (W.C.T 15/11/1886).

In the Grey River, the flood not only filled up a large dredged bay in the lagoon, but deposited sediment to raise the bed 60cm higher than before the dredging had started. (W.C.T 18/11/1886).

#### 21 - 22 APRIL 1887

Although the weather had moderated on the coastline, continued storms occurred in the mountains bringing all creeks and rivers into flood. (W.C.T 22/04/1887)

The Greenstone area was particularly hard hit by the flood. A 300m length of road was torn up and stripped of metal and at another site, a 9m gap formed when a culvert and the ground each side of it were torn away. A large quantity of sludge destroyed another spot. Others parts of the road disappeared and water scoured under the hill side. (W.C.T 25/04/1887)

#### 6 JULY 1887

Although strong gales decreased, heavy rain from the nor-west persisted causing severe flooding in Buller, Westland and Canterbury. (W.C.T 07/07/1887) Warm temperatures led to snowmelt, raising the rivers even higher than the rain had.

In Greymouth the flood was the worst on record to that time; the flood waters being backed up by an extremely high spring tide. Water overflowed the wharf at 9.00am and the flood peaked at noon, and had receded by dusk (Jackson 1968). Flood levels in the town were about 60cm higher than the 1872 flood, causing severe destruction of property. Every business and house along Mawhera Quay was flooded to a depth of at least a metre and boats were needed to rescue people between 3.00am and 10.00am. Asphalt pavements were destroyed and dangerous debris was strewn about the streets. Much of planking on the new wharf needed replacing. The weighbridge office on Mawhera Quay was washed about 180m downstream and the approach to the Cobden Bridge on the Greymouth side was washed away. Gas mains became water logged leaving much of Greymouth in darkness during the flood. At its peak, the river nearly touched the base of the Cobden bridge; water level in the mid channel area was reported to be about a metre higher than at the banks. The lagoon filled up and broke through to the sea in several places, alleviating some of the problem. (W.C.T 08/07/1887)

All the Coal Creek Flat was submerged and it was assumed Lake Brunner had 'broken out' and swelled the flood, as the river rose quite unexpectedly between 6.00am and 7.00am. At Wallsend, the river came within 60cm of entering the mine shaft, washing away the carpenters shop, a number of outhouses and about 3 tonnes of powder. Several houses at Taylorville were also flooded and a large number of stock were lost between Coal Creek and Brunnerton. (W.C.T 08/07/1887) The Arnold River was in high flood, claiming the life of one man.

The Taramakau and Arahura River flood levels exceeded previous records. The Taramakau overflowed the road and entered Waimea Creek, resulting in many bridges being damaged and farm land flooded (W.C.T 08/07/1887). The Arahura eroded into the native reserve and it was feared it would break out near the bridge and enter the lagoon.

The Hokitika River was in high flood all day, bringing down very large logs and assorted debris. The open river crossing at Quinns Hotel was very full, being backed up by tidal waters. The small footbridge was washed onto the road as well as wire, fence posts and other debris. Telegraph communications could go no further north than Kumara. (W.C.T. 07/07/1887)

In Westport, the Buller River was bank high - the highest for several years, suspending all inland traffic and shipping. The Oreola Frigate, stranded on the bar for two weeks broke free, drifted seaward and disappeared. (W.C.T 08/07/1887)

Note - Shortly after this flood the concrete nibwall along Mawhera Quay (Greymouth) was built, 30cm (1ft) higher than the flood level. (R. Daniel, per.comm.1989)

#### 27 MARCH 1887

A small farm on the south bank of the Taramakau River between the bridge and the cage crossing was badly damaged by the flood waters. A large percentage of the farmers stock was lost, along with 4ha of feed oats, 10 tonnes of hay, and over half a hectare of potatoes. Many hectares of good ground was covered with silt. (W.C.T 01/04/1887)

#### (DATE UNKNOWN) SEPTEMBER 1889

A recent flood in the Taramakau was not quite strong enough to make an impression upon the tailings in the river bed where the Kumara sludge channel empties itself. (W.C.T 07/09/1889).

#### 13 SEPTEMBER 1889

Warm rain melted snow in the ranges, bringing the Grey River to within about metre of the Wharf at Greymouth. No damage was reported. (W.C.T 13/09/1889).

#### 24 MARCH 1896

A large flood occurred in the Buller River reported to be at least equal in magnitude to the 1877 flood at Westport. The flood levels were 30cm lower upstream of the Buller Bridge and half a metre lower downstream of the bridge than the 1877 flood. At Inangahua the flood was about two metres lower than in 1877 although accurate comparisons cannot be made as the 1877 tidal conditions were not recorded (Cowie 1957).

#### 1 OCTOBER 1897

Strong northerly winds and warm rain melted snow in the ranges during the night and on the morning of the 1st the Hokitika River was in a state of considerable fresh. (W.C.T 01/11/1871).

12 OCTOBER 1897

In forty eight hours 73mm of rain fell in the Mawheraiti area. Many crops were destroyed by the Mawheraiti River (W.C.T 22/10/1897) which was in strong flood all day on the 12th. (W.C.T 23/10/1897).

Considerable damage was done to the road between Taipo and Arthurs Pass - two slips came down in the Otira Gorge and one at Pegleg Flat. About 240m of road between Kellys Creek and Aickens was washed away. Many slips also occurred in the Jackson's region. At Rocky Point and Harleys Creek numerous slips covered the road - at Rocky Point, the road was also cut away. The road between Harris's and Waihinini was 60cm under water, whilst at Rangiriri it was flooded to a depth of 2.1m. (W.C.T 26/10/1897).

21 - 22 OCTOBER 1897

Between Wednesday 20th and 10.00pm on Thursday 21st, 229mm of rain was recorded in the Hokitika area. The rain was accompanied by strong north west winds. (W.C.T 23/10/1897).

The Hokitika River was in high flood all day on the 21st, and at high tide the lower streets of the town were flooded. In a couple of places water remained in the streets throughout the day. On the night of the 21st, Hokitika was again flooded, but by the morning of Friday 22nd, the river was going down. (W.C.T 22/10/1897).

30 NOVEMBER 1897

A slip on the embankment of the Hokitika River between the main wharf and the coal wharves increased pressure on the front row of piles and the whole structure fell into the flooded river and was swept. As the day progressed the river continued to cut into the end of the main wharf and embankment. (W.C.T 01/12/1897).

27 DECEMBER 1897

This flood was the biggest recorded in Greymouth to that date. Water came over the Wharf and flooded much of the town. Streets were scoured badly and many stores and houses were damaged (G.E.S 27/12/1957). Little else is known as newspapers of the time reported very little detail and the Greymouth Borough's records were destroyed by fire in 1947.

28-31 OCTOBER 1900

The flood peaked on the 31st with the flood level at Westport being the same as the 1896 flood and about one metre lower at the Buller Bridge. This flood caused less damage than the 1896 flood as the peak coincided with low tide (Cowie 1957).

25 JUNE 1905

Heavy rain associated with gale force winds brought widespread flooding to Buller and Westland. The Grey River rose rapidly in two hours and lapped the Greymouth Wharf at 5.00 a.m., later rising higher than previously experienced in the town. All the main streets in Greymouth were flooded with Mawhera Quay and the major streets becoming raging torrents. In Blaketown near the old powder magazine, a channel was cut between the lagoon and the sea to relieve backed up water pressure in the town. By the time the river was level with the wharf, the lower end of Greymouth was completely flooded up to 1.5m deep in some places. The whole of the business district was eventually flooded. Water coming over the wharf tore away embankments and undermined and destroyed the railway track along Mawhera Quay. Every dwelling from Tainui Street back to the Tidal Creek and down to the Lagoon had flood waters in it.

At Coal Creek several settlers lost nearly all their stock and up the valley farmers also lost large stock numbers. The Ngahere and Blackball district suffered heavily. The whole approach to the Blackball road/rail bridge from the bank to its terminus - about 200m to 240m was completely levelled. (Jackson 1968, Hawker 1977) This represented about one years construction (Cowie 1957) and delayed completion for a long period. Many washouts also occurred on the rail lines between Greymouth and Reefton, and Greymouth and Otira (Jackson 1968).

Westport was flooded although little damage occurred to the Borough. The 1877 flood was 1.2m higher at Hawkes Crag although the same level was recorded at Westport. A metre of water covered the road near Cronadun and one of the new cylinders of the road/rail bridge was shifted at Inangahua Landing (Cowie 1957).

#### 18 OCTOBER 1906

The Whataroa River was in flood, running high and fast (Otago Daily Times 19/10/1906). Little else is known.

#### 28 MARCH - 1 APRIL 1913

On Saturday (28th) the Grey River rose considerably. In twenty four hours to 9.00 a.m. on Monday 31st, Greymouth received 44mm of rain, accompanied by strong winds. In Kumara, the storm was considered the most disasterous in the history of the district. The Taramakau River was in a 'mighty flood' and washed away two 24m spans of the road bridge and over 30m of the southern approach. The flow was very swift and eroded the bank rapidly. Much river protection work on the Taramakau was completely destroyed (G.R.A. 31/03/1913).

Further afield the Wanganui River was also in high flood damaging good farmland as it broke its banks and drowned a large number of stock. Just over half a metre of water flowed through the Inter-Wanganui Dairy Factory and the road leading to the factory was cut, thus halting supplies to and from the factory. A flax mill at Whataroa was badly damaged and about 30 tonnes of flax was washed away. Culverts along the main south road were cut into badly, as were the banks of the Little Wanganui River.

Floods were equally severe at Kokatahi-Kowhitirangi with the road to Hokitika from this district being covered in 1 to 1.8m of water in many places (G.R.A. 01/04/1913). The Westland railway suffered no serious damage, but one of the approaches to the Wainihinihi Bridge was washed out as were the approaches to the Kokatahi Bridge (G.R.A. 31/03/1913). The Hokitika River recorded its highest ever levels (Cowie 1957) and lower portions of the town were flooded (G.R.A. 31/03/1913). Serious damage was also reported from Okarito and Okuru (G.R.A. 01/04/1913), although no details are given.

#### 11 JANUARY 1920

A strong north-west wind accompanied by heavy rain brought heavy flooding to the Hokitika area. The Hokitika River rose 25cm above the 1913 record, and was 60cm from the top of the wharf. Low-lying portions of the town were submerged, and in the country considerable damage occurred to roads and bridges.



26 APRIL 1920

Extensive and heavy rain throughout the district caused heavy flooding, with a large amount of damage to back country roads and bridges. In thirty-six hours 203mm of rain fell at Hokitika, and at Greymouth 127mm fell in the same period.

12 - 14 JUNE 1921

Steady rain over three days resulted in flooded streams throughout the district. At Greymouth 140mm of rain fell in forty-eight hours, and the Grey River rose very high but did not flood the town, though local inundations did occur. The Omoto racecourse on the bank of the Grey was flooded to a depth of 1m. Slips came down on roads and the railway, but no serious damage was reported.

1 MARCH 1922

Very heavy rain, thought to be a cloud-burst, occurred in the Karamea district, washing away three bridges on the Arapito Road and some of the road formation as well as bringing down slips and causing other considerable damage.

9 JANUARY 1924

Heavy rain in south Westland caused serious flooding around Hokitika where 38mm of rain fell in twenty-four hours. The Hokitika River rose in high flood, and flood waters isolated Kokatahi. South from Ross the Kakapotahi Bridge over the Waitaha River was washed away. Other roads throughout the district were also damaged.

22 SEPTEMBER 1925

Heavy rain throughout the West Coast brought most rivers into high flood. The Grey River rose to within 1.2m of the wharf and large quantities of debris were brought down. In Greymouth many streets were under water, but no damage was reported. Over twenty-four hours 32mm of rain was registered at Greymouth. At Otira a hurricane combined with an electrical storm to give the district one of the worst nights it had experienced. In twenty-four hours 254mm of rain was registered, and all creeks were in high flood.

Two weeks of rain, hail, and snow culminated in the second biggest flood in Buller River records to that time. The Buller Gorge road at Hawkes Crag was covered by 1.2m of water, and one span of the temporary bridge at Inangahua Junction was washed away. The water level was 1.8m above the deck of the Ohikanui Bridge, 1.5m above the deck of the Chapmans Creek bridge, and 25cm from the girders of the Berlins Creek bridge. Some stock were lost and roads were blocked by slips and washouts, Westport being completely isolated for a period.

4 -5 DECEMBER 1925

Heavy rain throughout the West Coast brought rivers into high flood, the Grey River being only 30cm from the top of the wharf at the Peak. Water seeped through the banks and caused some flooding in the streets of Greymouth, but no damage resulted. Large quantities of debris were brought down by the river. Four washouts occurred on the Midland Railway between Kaimata and Rotomanu, and at Arthurs Pass some 180m of line were washed out. At Otira 305mm of rain was recorded overnight. The most serious damage to occur, however, was the washing out of two spans of the Blackball railway bridge over the Grey River. The Hokitika River was also in high flood, and the low-lying parts of the town were inundated, but no great damage resulted. Several roads in the area were blocked by flood waters. Damage to Grey county roads amounted to 2,500.

The Inangahua River was also in high flood and many washouts and slips were reported from country districts. The roads to Nelson and Westport were flooded by water, and traffic was suspended.

#### 10 - 11 DECEMBER 1925

Heavy rain, particularly in the Alps, caused rivers to run high, and at Otira 152mm of rain was recorded in twenty-four hours. The Midland railway suffered serious damage due to a large slip at Aickens, and transhipment of passengers on trains was necessary.

#### 3 MAY 1926

As a result of a flood in the Grey River two spans of the combined rail and road bridge between Ngahere and Blackball were washed away, this being the second occasion that it had occurred within six months. The two spans were each of a length of 24m. This resulted in Blackball being isolated and the mine being rendered idle.

#### 8 - 9 MAY 1926

Heavy rain in the high country caused extensive floods on the West Coast, and disorganisation to train and road services when several slips occurred on the Midland railway between Kaimata and Moana. At Greymouth 55mm of rain was recorded in 24 hours. The Grey River was in moderate flood but caused no damage, though some minor flooding occurred in cellars of premises in Greymouth. The Hokitika River was also in high flood but caused no damage. Damage to roads in the Grey county amounted to 1,530 and in the Murchison county, 700.

#### 30 - 31 OCTOBER 1926

Following upon a week of wet weather, rivers in the district became flooded. The Grey River rose to within 30cm of the wharf at Greymouth. Considerable anxiety was felt lest the river break through into the town, but the only flooding to occur was of a minor nature and little damage was reported. Rivers in the south were also in high flood, and roads were blocked by slips and washout. 400 damage occurred on Grey county roads.

A very heavy flood occurred in Westport, and considerable damage was done in the Buller Gorge road where several landslides took place. A temporary bridge at Hawkes Crag was washed away, and two spans of the combined road and rail bridge at Rotokohu suffered a similar fate. At Reefton the Inangahua River rose to within 30cm of the bridge at the lower end of the town.

#### 4 - 5 NOVEMBER 1926

The flood of the previous week was eclipsed by a torrential downpour experienced in Greymouth and the surrounding districts. The rain was accompanied by a north-westerly wind which rose frequently to the dimensions of a gale. The Grey River rose to the level of the planks at the Greymouth Wharf, and the low-lying parts of Greymouth were flooded, though no premises were seriously invaded.

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Westport experienced perhaps its most disastrous flood when the Buller River broke its banks and flooded practically the whole town. Hundreds were rendered temporarily homeless, and

many lost all their belongings when flood waters entered their homes. At the peak of the flood the Buller River was within a metre of the top of the combing and at Te Kuha the discharge was estimated at 7645 cumecs from 6060 square kilometres, although it is now believed that the discharge must have been much greater as the peak was some feet higher than the May 1950 flood the peak flow of which was determined by an accurate slope-area determination.

The flood water lapped over the top of the caps of the Buller railway bridge at the height of the flood, and an enormous white pine 32m long got across piers 11 and 12, knocking pier 12 22cm downstream. Pier 13 scoured out and sank 30cm on the upstream side. The damage to public services amounted to

50,000. In the Murchison area, where 78mm of rain fell in twelve hours, serious damage occurred when the Longford Bridge over the Mangles River was washed away, and farmers suffered damage to farms through inundation and flood water. At Fern Flat the river rose 12.1m above normal, and the occupants of one home were forced to break a hole in the ceiling to escape the flood waters. At their confluence the Tutaki River peaked at 140 cumecs off 65 square kilometres, and the Tiraumea River 375 cumecs off 114 square kilometres. In the Reefton area some bridges were washed away and many roads were damaged. Buller county roads suffered damage amounting to 7,320 and the Murchison county damages totalled 11,480.

#### 7 DECEMBER 1926

Following rain which melted snow on the Alps, the Grey River rose 2.1m in a few hours at the Brunner Gorge. No serious damage occurred apart from washouts on some roads.

#### 23 - 24 MARCH 1927

Heavy southerly weather accompanied by rain caused flooding in many parts of the district. At Greymouth 30mm of rain was registered in twenty-four hours. The Grey River was in high flood and water flooded the Omoto racecourse, and around Coal Creek Flat farms were inundated.

#### 5 - 6 MARCH 1929

Heavy rain throughout the Greymouth area caused some minor flooding. In the Moonlight district 101mm of rain was recorded in twenty hours, and at Greymouth over 51mm fell in twenty-four hours. The Grey River rose to a moderate height but caused no damage. Main roads were blocked for a short time by flood waters.

#### 5 JUNE 1929

Heavy rain brought a bank-high flood to the Hokitika River, the peak level being 28cm below the previous record flood of 1926, and parts of the town were submerged. Other rivers in the area were also at a high level, and several roads were impassable owing to flood waters.

#### 4 JULY 1929

Following the tremendous Murchison earthquake of 17 June 1929, the Mokihinui River was dammed by a slip in the upper gorge, 26 kilometres from Seddonville. At 2 p.m. on 4 July the dam gave way and a wall of water raced down the valley, the water rising so high between Seddonville and Mokihinui that it poured through the railway tunnel. When the wave struck Seddonville disastrous damage resulted. In the church 30cm to 46cm of mud lay on the floor, and the water level reached 2.4m up the walls. Some houses were totally submerged, and a hall was floated off by the flood and deposited 80 or 100m away. This was the most serious and disastrous aftermath of the earthquake, but fortunately no lives were lost.

8 SEPTEMBER 1929

Another aftermath of the Murchison earthquake, a dam in the Little Wanganui River, broke away, and considerable damage was done in the Wangapeka Valley, where two or three houses were shifted for a distance of some metres. One bridge was destroyed and stock losses were heavy.

6 NOVEMBER 1929

A cloud-burst in the Crushington area caused much slipping and erosion, but apart from some damage to roads no serious damage was reported.

19 - 20 NOVEMBER 1929

Heavy rain over the whole of Westland caused some anxiety, but no serious damage occurred. At Greymouth 33mm of rain was recorded in twenty-four hours, and the Grey River rose at the rate of 30cm per hour to reach a peak level of one metre from the wharf. At Hokitika the rain fell steadily, but the river did not rise appreciably. At Reefton a steady downpour fell for twenty-four hours and resulted in several places being inundated. Some roads were blocked, but damage was generally very slight.

16 DECEMBER 1929

After several hours rain, a cloud-burst at Norris's mill, 10km from Westport in the Buller Gorge, caused some damage to the Waimea Creek Bridge and severed a water pipeline. A large slip also came down in the vicinity.

29 DECEMBER 1929

A dam in the Karamea River, caused by the Murchison earthquake of June 1929, gave way and caused a major flood in the Karamea Valley. Water inundated the township of Karamea, causing serious damage to property and heavy loss of stock. Water was 60cm deep in the township and some houses were invaded.

7 - 10 OCTOBER 1930

Following four days of heavy rain, flooding occurred in many places on the West Coast. At Greymouth 34mm were recorded in twenty-four hours, and a total of 125mm fell in three days. A large slip of over 2300 cubic metres caused some damage at the hydro-construction works at Kaimata. The Grey River was in moderate flood but caused no anxiety. At Harihari a flood swamped the flat between the Big and Little Wanganui Rivers, one house being flooded to a depth of 46cm.

Heavy rain also fell in the Westport area and caused many washouts and slips. The Millerton mine was idle because of six slips on the road. At Karamea the river broke its banks, flooding low-lying land and damaging the roads, but not extensively.

3 JANUARY 1931

The Otira Gorge and Arthurs Pass areas experienced a cloud-burst, which swelled all creeks and streams in the area and blocked the main road. No serious damage was reported, however, other than the severing of the Greymouth-Christchurch highway below Otira.

20 JANUARY 1931

Heavy rain throughout the province caused streams and creeks to become flooded. At Otira 167mm of rain was recorded in twenty-four hours, and the Otira Gorge was blocked through

slips. Other roads were similarly affected. The Grey River rose slightly above normal but caused no damage.

#### 2 FEBRUARY 1931

Heavy rain in south Westland caused serious damage to roads and bridges. At Waiho 317mm of rain fell in twenty-four hours and 432mm in forty-eight hours. Both the Little and Big Wanganui Rivers overflowed their banks and flooded the adjoining land. Approaches to bridges were washed out and road surfaces were damaged. An estimated 5,000 damage was done to roads and bridges in the area.

#### 22 FEBRUARY 1931

Exceptionally heavy rain in the Greymouth area - 317mm in twenty-four hours - caused extensive flooding in the town, this being the heaviest twenty-four hour fall ever recorded in Greymouth. Sawyer Creek overflowed, and the low-lying portions of the town were inundated to depths of 46cm. Revington's Hotel was flooded to a depth of 30cm on the ground floor, and several houses had to be abandoned. The Grey River did not rise appreciably, and the flood waters soon drained away.

#### 3 APRIL 1931

Heavy rain accompanied by high gales caused considerable damage throughout the West Coast area. In Greymouth 75mm of rain was registered in twenty-four hours. At Hokitika a spring tide backed the river up and many parts of the town were flooded, the river at its peak being 46cm from the top of the wharf. Other rivers in south Westland were also in high flood. In the Grey district most of the damage was due to the wind, the Grey River rising slightly but not dangerously.

Floods and washouts also occurred throughout the Buller district. The Buller River rose 18cm in ten minutes at Berlins at one stage, to be 60cm over the road of Hawkes Crag. Further north, the Karamea and Oparara Rivers were both in high flood, and losses of stock were reported in these areas. At Karamea some houses were invaded by water.

Tiroroa 330mm of rain was recorded in twenty-four hours, and many roads were blocked by slips and washouts. One man was killed when a slip severed his leg.

#### 20 NOVEMBER 1931

Welcome rain after a particularly dry period throughout the West Coast caused some damage when Lawson Creek Bridge, near Barrytown, was washed away. The rainfall reached cloud-burst intensity at Barrytown.

#### 29 JANUARY 1932

Exceptionally heavy rain caused some widespread flooding and damage. In Greymouth some parts of the town were flooded, and in the surrounding district many roads were blocked by slips and washouts. At Hokitika some flooding occurred in the town, and damage was caused to works under construction at the Seaview Hospital.

#### 31 JANUARY 1933

As the result of abnormal nor-westerly rain high floods occurred on all rivers of the West Coast. The Grey River rose rapidly, at one stage by 2.1m in two hours, reaching a peak level of within 30cm of the wharf. Some local flooding occurred in Greymouth, but water entered no premises.

At Hokitika the river overtopped the bank above the railway bridge and the lower portions of the town were submerged, but not seriously. The water subsided just in time to avert serious damage.

The Buller River also rose to a high level, parts of Westport being inundated, and at Reefton some local flooding occurred when channels could not cope with the rainwater. At Karamea the river broke its banks and flooded a large area of land, and numerous slips blocked roads.

#### 15 - 16 JULY 1933

Torrential rain throughout the West Coast caused serious damage in some localities. At Greymouth 93mm of rain was recorded in twenty-four hours and 178mm in forty-eight hours. The Grey River caused no anxiety, but many roads in the surrounding district were damaged by slips and washouts. The Wainihinihi Bridge was seriously damaged when two piles were broken, and one end of the bridge subsided 1.2m. At Hokitika 133mm of rain was recorded in twenty-four hours and 263mm in forty-eight hours, and the Hokitika River rose 2.1m above normal. Streets and property in the lower parts of the town were inundated, and several business premises suffered severe damage and it was reported that 508mm of rain fell at Waiho in two days.

#### 16 DECEMBER 1933

Heavy rain over two days caused numerous and severe washouts on the railways. The Midland line was blocked by an extensive washout near Stillwater, and the Reefton line was blocked by a washout near Ngahere. On the Rewanui line two washouts occurred and the line was under water for a considerable distance. In Greymouth, where 168mm of rain fell in thirty hours damage was done to streets, and Revington's Hotel was invaded by 30cm of water. Many other premises were also flooded. The Grey River was running very high with a 3.5 m/s current.

#### 17 APRIL 1934

Heavy rain caused some serious damage on the Midland railway when a serious washout occurred at the Poerua Bridge. The creek was dammed higher up by a slip which suddenly gave way, and the sudden rush of water caused extensive damage to the approaches, cutting a breach 6m long and 3m deep within ten minutes.

#### 27 JUNE 1934

Torrential rain caused flooding in and around Greymouth after nearly 102mm of rain was recorded in two hours. Several premises in the town were invaded and slips occurred on some roads. The bridge at Dirty Mary's Creek, near Addisons on the Westport coast road, was washed away. The Grey River rose moderately but caused no damage. At Arthurs Pass 120mm of rain was registered in twenty-four hours, and a large slip blocked the Otira Gorge road. Railway services were also interrupted by a large washout at Omoto, just outside Greymouth.

#### 20 FEBRUARY 1935

The greatest flood that Hokitika has ever known occurred as the result of a phenomenal rainfall following a prolonged drought. In twenty-four hours 233mm of rain was registered, a fall that had never been exceeded before. The lower portions of the town were flooded up to a depth of 1.2m, and many houses and business premises were invaded, causing considerable loss to the owners. The 18.2m southern span of the Kaniere Bridge over the Hokitika River was swept away and floated out to sea, fortunately passing under the combined bridge at Hokitika but causing a menace to shipping in the vicinity. A number of other bridges were also damaged. The Arahura combined road and rail bridge was damaged and the Arahura Valley was

devastated, practically every fence in the valley being down and at least half of the paddocks covered with shingle and boulders. The Arahura Valley road looked more like a stream bed after the flood. It is estimated that at Humphreys 432mm of rain fell in twenty-four hours. At Greymouth 70mm was recorded in twenty-four hours and 114mm in thirty-six hours. No serious damage was reported in Greymouth and the Grey River rose in only moderate flood. Roads throughout the West Coast suffered severe damage through slips and washouts, the damage in the Westland county totalling 3,380.

#### 20 MARCH 1935

Torrential rain in the Millerton and Granity areas caused extensive damage to both roads and railway. A large slip beyond Ngakawau covered a road bridge to a depth of 6m, and the railway to a depth of 3.6m. Considerable inconvenience was caused during the dislocations, traffic being disorganised for several days.

#### 10 - 12 OCTOBER 1936

A north-westerly storm, together with high winds and heavy rains brought serious floods to the West Coast. These floods were considered the biggest since 1887. In a thirty-hour period 55mm of rain fell at Greymouth, and of this 35mm was recorded in six hours. The Grey River was in very high flood and invaded the town, causing extensive damage and serious losses, particularly to business premises. In the vicinity of Revington's Hotel the water was 1.5m deep, while in the hotel itself the chairs in the dining room were afloat. Many homes had to be evacuated, some occupants being rescued by boats. When the flood waters subsided the streets were covered with a good thickness of silt. At the height of the flood the Grey River was flowing at 6.1 m/s and enveloped the wharf, to overtop its banks at the lower end. Old residents, who retained marks on the walls of their homes, indicated that this flood exceeded the 1913 flood by 23cm, and this was also confirmed with levels at the Omoto racecourse. Stock losses in the country were very severe and exceeded those of the 1913 flood, the heaviest losses occurring between Ahaura and Stillwater. Several bridges were washed away in the area, and extensive slips blocked some roads. The Hokitika and Arahura Rivers did considerable damage to protective works. At Hokitika the river was bank high but no damage was done, although the airfield on the south side of the river was inundated.

Heavy flooding also occurred in the Buller area. The rainfall at Reefton for twenty-four hours was 62mm, 25mm falling in the first six hours, the same in the next six hours, and the balance in the following twelve hours. The Buller River was in very high flood, rising 7.6m at Cascade. At the Nile Wharf in Westport the water was 1.2m from the combing. The peak discharge at the Rotoroa outfall was 110 cumecs. The rain caused many slips on the Buller Gorge road, and water covered it in places. Many slips also came down on the road between Inangahua and Lyell. At Karamea extensive flooding occurred, and much of the town was inundated. Simpson's Hotel was flooded to a depth of 30cm and many homes had to be abandoned. The Karamea River at the mouth was discharging, at its peak, 1900 cumecs off 1600 square kilometres of catchment, and intensity of 4mm per hour. The discharge in 1913 was estimated at 3140m. At lower Mokihinui all the houses were flooded, and one house in a low-lying position in Seddonville was invaded. Total damage to county roads in the Buller area was 4,970.

#### 5 JANUARY 1937

Some surface flooding occurred in Greymouth following heavy rain in which 30mm was recorded in six hours. Creeks were in high flood and many streets were awash.

#### 8 - 9 MAY 1937

Torrential rain over most of the West Coast, accompanied by a north-west gale, brought flooding to many areas. At Greymouth 72mm of rain fell in twenty-four hours, and the Grey River rose to within 1.5m of the wharf at high tide. Some flooding of farmlands occurred, and stock losses were reported.

#### 4 JUNE 1937

The Grey River was in high flood following heavy rain which totalled 31mm in twenty-four hours at Greymouth. The Grey River was running high and shipping was affected, but no damage was reported.

#### 12 JULY 1937

A deluge in Greymouth in which 51mm of rain fell in seven hours caused some minor flooding in and around the town. Stormwater backed up in some streets and several houses were invaded.

#### 8 - 9 JANUARY 1938

Low-lying areas on the West Coast were inundated with a two-day deluge of rain. At Greymouth 52mm of rain fell in twenty-four hours and 77mm in forty-eight hours, and at Arthurs Pass 91mm fell in twenty-four hours. Slips and washouts blocked many main roads temporarily, and a train ran into a slip at Omoto near Greymouth, causing considerable damage to the rolling stock. Continuous rain caused numerous slips and washouts to roads in the Buller district, and others were impassable due to flood waters. Damage, however, was slight and of a local nature.

#### 14 FEBRUARY 1938

A cloud-burst which struck the Otira area caused extensive damage to roads and bridges; 127mm of rain fell in two hours. At Goat Creek, about 400m above Otira, the new traffic bridge was covered to handrail level with boulders brought down off the mountainsides, and the whole bed of the stream, whose slope is steep enough to be measured in degrees was raised to this new level for a distance of some 180m. Large quantities of water invaded Otira township, but no serious damage was reported. Flooding also occurred in Kumara, where water 30cm deep covered the main street, and some damage was caused to streets and footpaths.

#### 21 MARCH 1938

Heavy rain in a period of two hours, during which 44mm fell in Greymouth, caused landslides and serious erosion on hillsides. During the previous four days over 178mm of rain had fallen, thus the ground was saturated prior to the heavy fall. Roads throughout the district were blocked by slips, one at Omoto, near Greymouth, being in the vicinity of 11500 cubic metres. At Kumara a miner met his death when a fall of earth crushed him. All rivers on the coast were in high flood, and some areas were extensively damaged.

A long spell of dry weather was broken in the Buller district by the heavy rain, which caused considerable flooding in all rivers and streams, and a washout occurred on the railway near Birchfield. Heavy rain in the Lake Rotoroa area caused a peak discharge at the outfall of 90 cumecs.

#### 7 APRIL 1938

Flooding occurred in the lower parts of Reefton following heavy rain, and several residents in the lower part of Broadway had to evacuate their homes. The Inangahua River was in very high flood, and large slips occurred on many roads in the vicinity.



13 - 14 APRIL 1938

Torrential rain and snow melted by the warm north-westerly wind brought heavy flooding to West Coast rivers. The Hokitika River overflowed its banks and invaded a third of the Borough of Hokitika to an average depth of 30cm. Considerable damage was caused by water entering many houses and shops and also by the deposition of silt and mud. At its peak the river was 60cm from the decking of the combined road and rail bridge. The Grey River was also in high flood, though little rain fell in Greymouth. Some areas of the Grey Valley were inundated, and several roads were blocked by slips and washouts.

28 - 29 MAY 1938

Heavy rain throughout the Grey Valley, particularly at Rewanui, caused some damage in the district. At Greymouth 51mm of rain fell in twenty-four hours, but no damage was reported there. Two bridges at Dunollie were swept away, several slips blocked roads, and the Liverpool mine was idle for several days. Washouts also occurred on the railway.

14 SEPTEMBER 1938

Warm inland rains caused a sharp rise in the Grey River, which at its peak was running a 5 m/s current. At one stage the river rose 1.2m in two hours. Local flooding occurred in some districts, but damage was slight. At Greymouth 31mm of rain was recorded in twenty-four hours.

2 - 3 DECEMBER 1938

Heavy rain brought creeks to a high level, and local flooding occurred in the Greymouth district. On the Midland line trains were held up by debris swept on to the track at Inchbonnie.

11 - 12 JANUARY 1939

Following a fall of 29mm in 24 hours at Greymouth, five slips came down on the Midland railway between Aratika and Kaimata. Damage generally was slight, however, and apart from a small washout, all roads were open.

29 NOVEMBER 1939

Heavy north-west rain brought a flood to the Hokitika River, and many low-lying areas of the town were submerged. The Kokatahi Valley was also flooded, and water blocked many roads. The Arahura River was also in high flood, but protective works were reported to have worked satisfactorily.

24 JANUARY 1940

An incessant coastal downpour fully taxed the stormwater drains in Greymouth with the result that severe surface flooding occurred in many parts of the town. Almost 30cm of water covered Tainui Street in the vicinity of the post office, and a similar state of affairs existed in other low-lying portions of the town.

During the twenty-four hours 49mm of rain was recorded, and in the following seven hours another 38mm fell. The Grey River, however, did not rise appreciably.

26 - 27 FEBRUARY 1940

After two months of almost continual rain a steady downpour resulted in widespread and heavy flooding. Some 69mm of rain fell in twenty-four hours at Greymouth, but the fall was greater in the Alps and the headwaters of the rivers. The Grey River rose 6m above normal in the Brunner Gorge to flow at 5 m/s, and was discharging at the rate of 5300 cumecs. The Ahaura at the state highway bridge was discharging an estimated 2520 cumecs. Floodwaters invaded

Greymouth. Some damage was done to streets, and water flowed across the top of the wharf. Several houses in Cobden were also flooded and some damage was done. The Hokitika River was in heavy flood, and at the Kaniere Bridge was estimated to be discharging 4530 cumecs; the Arahura River at the combined road and railway bridge was discharging an estimated 1250 cumecs, and the Taramakau River 2525 cumecs at Kumara Traffic Bridge. The streets of Hokitika were flooded, but no serious damage was done. At Otira the downpour was accompanied by a vivid electrical storm, with winds reaching velocities up to 145 and 160 k.m.h.

One of the most extensive slips in the history of the Midland railway occurred at Jacksons and completely obliterated the road and railway for a distance of 40 or 60m. The slip buried both the railway bridge and the road culvert at Nellies Creek. Several other minor slips occurred in the area, and slips and washouts were prevalent in other parts of Westland. Several bridges were washed away including the Kumara Traffic Bridge. The combined road and rail bridge from Ngahere to Blackball over the Grey River, survived the flood, but it was pushed out of alignment and sank 1.2m. The Karangarua River Bridge suffered severe damage when a large section of the northern approach was washed out. In the Buller district damage was extensive. Washouts blocked some roads. At Karamea the rivers were in high flood, but they were effectively contained within their banks and caused no damage. The peak discharge at the Rotoroa outfall was 133 cumecs. The Lewis Pass route was blocked by a series of washouts and slips. Damage to roads was as follows: Westland county 3,000 and main highways 2,200; Grey county 3,000 and main highways 580; Buller county 500 and main highways 90.

#### 27 AUGUST 1940

After a heavy downpour of rain the Ngakawau River overflowed its banks and flooded the business area of the town. Accumulation of deposits at the mouth of the river interfered with its flow. Some shops were flooded to a depth of 45cm or more.

#### 17 - 18 OCTOBER 1940

Heavy rain brought all rivers on the West Coast into high flood. In eleven hours 57mm of rain was recorded in Greymouth, and a further 19mm fell in the following nine hours. Telegraph and telephone communication with the rest of the country was broken. The Grey River was in high flood, running between 4.5 and 5 m/s. At Rewanui 102mm of rain was recorded overnight, and an extensive slip came down on the railway line to the mines. The Otira Gorge road was cut by a washout at Otira and water came over the railway line at Rotomanu. In the Buller district heavy continuous rain caused minor flooding. Stormwater drains in some parts of Westport could not cope with the flow of water when the downpour was particularly heavy, and the footpaths were under water in places. Some residences were damaged at Ngakawau and Hector when creeks overflowed. Minor washouts also occurred in some places, and a slip on the Granity-Millerton road interrupted traffic.

3 FEBRUARY 1941

A serious blockage of road and railway routes was created by an exceptionally heavy overnight downpour, which was accompanied by a high north-west wind. At Greymouth 93mm of rain fell in twelve hours, at Rewanui 191mm fell in twenty-four hours and 214mm fell at Otira in the same period. Flood waters backed up in low-lying areas in Greymouth streets, but no damage occurred. Several slips occurred on the Midland railway and flood waters were over the track between Ngahere and Ahaura, near Reefton. Extensive slips also occurred on roads, and the Lewis Pass was the only main route unaffected.

10 JUNE 1941

An exceptionally heavy rain, accompanied by a violent northerly gale, caused floods in the Hokitika area. Backed up by spring tides, an extremely heavy flood occurred in the Hokitika River, which flooded the low-lying parts of the town. No serious damage occurred, however. At Greymouth 29mm was recorded in twenty-four hours. Though there was only a slight rise in the Grey River, the smaller streams in the district rose rapidly and low-lying parts of Greymouth were flooded. Damage was mainly from the gale-force winds which accompanied the storm.

19 NOVEMBER 1941

Continuous heavy rain over two days brought rivers in the Hokitika area into high flood. At Hokitika the river rose to a high level, and backed up by the tide, water inundated many streets. The Arahura River caused some damage at the new Malfroy Bridge under construction, and in the Kokatahi Valley flood waters spread over the land in the vicinity of the rivers. In South Westland extensive flooding occurred and some damage was reported to roads and bridges.

Rainfalls recorded in twenty-four hours included: Haast Pass 188mm, Karangarua 188mm, Whataroa 218mm, and Lake Kaniere 153mm. Damage to state highways in the Greymouth area amounted to 1,600.

4 - 8 APRIL 1942

A succession of northerly storms, in which 109mm were recorded in the five days before the 4th, brought floods to the whole area. In six days 235mm fell in Greymouth, and it was estimated that 25mm of rain fell in three hours on the morning of the 4th. At Karangarua 124mm of rain fell in 24 hours. All rivers were in flood, the Grey River in particular being at a high level for over two days. No flooding of the town occurred, however, but at one stage the river threatened to top the wharf at high tide. Numerous slips and washouts occurred on the roads. The most serious damage occurred with slips on the railway line to Rewanui causing the stoppage of coal production from the Liverpool State Mine. At Hokitika the river was in high flood, but it did not cause any damage, though some minor flooding occurred in the borough. One bridge was washed away in the Hokitika Gorge. In south Westland swollen rivers caused considerable damage to bridge approaches, and roads were severely damaged by scour, slips, and washouts.

Heavy rain in the Buller and Murchison areas caused severe flooding, and much damage was done to roads by slips and washouts. In the Murchison area all rivers were in high flood, Lake Rotoroa discharging 330 cumecs at the outfall and the Buller River rose to within 1m of the decking of the Longford Bridge. Numerous roads were blocked, one bridge was washed away and another was buried by debris. In the Buller Gorge the road was blocked by water at several places, and at Westport the river was only 1.5m from the top of the decking of the merchandise wharf. Damage to Murchison County roads was 3,700, to Grey County 850, and to state highways in the district 2,400.

5 MAY 1942

With heavy falls of rain, aggregating 69mm in twenty-four hours, semi-flood conditions were experienced at Greymouth. The rain, which was accompanied by a strong north-west wind, was torrential at times, and, though the Grey River developed only a moderate fresh, all creeks in the area were swollen. Slips came down on the railway between Stillwater and Brunner, and also on the Greymouth - Westport coast road at Twelve Mile. The approaches to the bridge over Blackball Creek were damaged.

12 - 13 JULY 1942

Heavy rain in the Grey district caused flooding, and numerous slips and washouts blocked roads. At Greymouth 118mm of rain was recorded in twenty-four hours and 160mm for forty-eight hours, and at Rewanui 188mm fell in twenty-four hours and 296mm in forty-eight hours.

Other twenty-four hour falls included: Karamea 81mm, Millerton 148mm, Westport 93mm, Rotoiti 64mm, Murchison 93mm, and Reefton 106mm.

At Greymouth the Grey River rose to within a metre of the wharf, but it dropped quickly on the cessation of rain. Some minor flooding occurred in the lower portions of Greymouth and some small slips came down in the area. In the surrounding districts many roads were blocked by water, slips, and washouts. The Midland railway was also affected in like manner, with snow on the higher places causing delays. Several coal mines were idle due to slips and washouts occurring on their lines.

Heavy rain also fell in the Buller area and caused much flooding in the lower-lying parts of Westport. A total of 93mm fell in twenty-four hours, and the Buller River was in high flood, being very near the decking of the wharf at high water. Some 2.7m of water covered the Nelson road at Inangahua, and the Buller Gorge road was blocked both by water and a slip. Many other roads in the area were also blocked by slips. Damage to Grey county roads amounted to 1,662, and to roads in the Inangahua county 1,100.

23 - 24 OCTOBER 1942

Heavy rains and high winds caused serious damage on the West Coast and completely isolated the area for a short time. At Greymouth 229mm of rain was registered in three days, 98mm being recorded in twenty-four hours. At Otira 300mm was registered in twenty-four hours, 159mm at Kaniere, and more than 178mm at Arthurs Pass in the same period. All rivers were in high flood, the Grey River running a "10 knotter" (5 m/s). Two spans of the bridge over the Big Wanganui River at Harihari were swept away. This isolated south Westland. At Hokitika low-lying parts of the town were extensively inundated, there being 1 metre of water around the post office. The lower parts of Greymouth were also under water as a result of the Karoro Lagoon backing up. Numerous roads were blocked by slips and washouts, but no serious damage occurred.

18 DECEMBER 1942

Heavy and continuous rain over a period of two days culminated in flooding, and extensive damage resulted throughout the district. At Greymouth 82mm of rain fell in twenty-four hours and 132mm in forty-eight hours. Flooding occurred in Greymouth when Sawyer Creek overflowed at two places. Numerous slips and washouts occurred on roads, and the Rewanui line became blocked by two slips, stopping work at the mines. At Hokitika surface flooding occurred, particularly on the aerodrome, and air services were suspended.

#### 6 FEBRUARY 1943

Heavy rain which fell in northern Buller County and Nikau area caused some flooding. A mile (1.6km) of railway line between Seddonville and Hector was washed out. Five farms were also damaged by a creek which changed its course and swept down trees and boulders. Among the buildings destroyed were milking sheds, shearing sheds, and a large sawmilling plant. The Mokihinui River was in high flood, and the Little Wanganui River experienced its highest flood for twenty-one years. There were heavy losses of stock in the area. Rainfalls recorded in twenty-four hours included: Karamea 76mm, Millerton 142mm, and Westport 65mm. Damage to roads in the Karamea and Seddonville districts amounted to 600.

#### 5 - 6 MARCH 1943

Very heavy rain fell in the Jacksons Bay - Haast area and 279mm of rain were recorded in thirty-six hours. The area most affected was the coastal strip, and the Okuru, Turnbull, Waiatoto, and Arawhata Rivers reached their highest level in twenty-two years. The Haast River, however, rose only to moderate proportions. Considerable damage was done to bridge approaches and protective works, and the highway at the Arawhata Bridge was flooded to a depth of 1m. Several large slips occurred in the vicinity of Jacksons Bay.

#### 17 - 19 SEPTEMBER 1943

Heavy rain over nine days, particularly in the Ikamatua area, caused high floods and some serious damage. At Greymouth 220mm of rain was recorded in nine days, with 45mm falling in twenty-four hours. Other twenty-four hour falls included: Rotoroa 52mm, Rotoiti 45mm, Murchison 55mm, Reefton 86mm. A span of a bridge over the Little Grey River at Ikamatua was washed away and a sawmill was isolated. A large slip also came down at Brunnerton, blocking the railway line and a large slip at Bealey blocked the Midland railway route. The Grey River was in moderate flood and very discoloured. Heavy rain also occurred in the Buller district, and the Buller River rose in moderate flood, the peak discharge at the Rotoroa outfall being 77 cumecs.

#### 12 NOVEMBER 1943

Although only 41mm of rain was recorded in twenty-four hours at Greymouth, there was an unexpected flood in the Grey River, the result of abnormal rain at Otira, some 178mm in seven hours. Low-lying areas of Greymouth were flooded by backed-up water. Both the Otira Gorge and Lewis Pass highways were blocked by slips, but no serious damage occurred to the railways. At Reefton 57mm of rain fell in twenty-four hours, and the swollen Inangahua River flooded low-lying land, causing loss of stock. Houses at Crushington were flooded to a depth of 46cm.

#### 18 - 19 JANUARY 1944

Heavy rain after a prolonged spell of dry weather caused numerous slips on both the Midland railway and road, effectively blocking traffic. Most of the slips occurred in the 10km between Otira and Jacksons, and an estimated 15300 cubic metres was reported as having fallen. The railway was re-opened after six days of heavy work. Several other roads suffered damage from washouts.

2 - 3 FEBRUARY 1944

Torrential rain throughout the West Coast brought heavy floods, and serious damage occurred to roads and railways. In Greymouth 144mm of rain was recorded in twenty-four hours. The Grey River had only a moderate rise, but several creeks in the vicinity were in high flood. At Runanga the lower parts of the town were flooded and water entered several homes. The most serious damage, however, occurred on the Midland railway, where slips of similar dimensions to those of 18 January came down at the same places. The railway services were again seriously interrupted.

10 FEBRUARY 1944

The third heavy rain to occur in three weeks caused serious damage, the railways suffering heavily. At Greymouth 89mm of rain was recorded in twenty-four hours, and at Rewanui 163mm fell in the same period. Slips again blocked the Midland railway, and train services were disorganised. A train was derailed when it ran into a slip about 20km from Westport. No one was injured, but thirteen wagons of coal were lost. Several roads were also blocked by slips and washouts. At Hokitika the river was in high flood, the water being only 60cm from the wharf at the peak but no serious damage occurred. The damage to roads in the Grey county from the floods of the previous three weeks amounted to 1,500.

29 JULY 1944

As a result of heavy rain the Buller River rose in high flood, and at low tide it was running at 4.5 m/s. Several low-lying portions of the district were flooded, but no losses of stock were reported, though a large quantity of winter food and early spring crops were destroyed through immersion in the flood waters. One stretch of the Westport-Cape Foulwind highway was under water, and the Buller Gorge road was blocked by a series of slips.

12 NOVEMBER 1944

A storm, which brought 44mm of rain to Greymouth in forty-eight hours (32mm of which fell in twenty-four hours), was experienced over a wide area on the West Coast and Canterbury. Its most serious effects were the disruption of rail traffic on the Midland line and between Hokitika and Ross. The Waimakariri River washed away the line between Cass and Cora Lynn, and serious washouts left 260m of railway line suspended between Ross and Hokitika. No damage was done to roads.

15 DECEMBER 1944

Heavy overnight rain brought floods, particularly to the Grey district. At Greymouth 59mm of rain was recorded in twenty-four hours; at Rewanui 213mm fell in the same period. Some coal mines had slips on their lines and work was interrupted. Water also blocked some roads. The Grey River was in high flood, being 76cm from the wharf at high tide, but no damage was done other than local flooding in some streets of Greymouth. Stock losses were slight. The Buller River also carried a slight fresh, the peak discharge at Rotoroa outfall being 73 cumecs.

13 JANUARY 1945

Extensive damage to roads in the Reefton area occurred following a heavy rainstorm, and the township of Waiuta was isolated for thirty-six hours when a bridge over the Blackwater Stream was washed away. The bridge, a hardwood structure 15m in length, was turned completely over and washed a considerable distance downstream. Slips and washouts blocked other roads. At Reefton 83mm of rain was recorded in forty-eight hours.

18 JANUARY 1945

Heavy rain in the Hokitika district brought the river to a high level, and low-lying parts of the town were inundated. Several roads in the district were also impassable due to flood waters. At Hokitika 92mm of rain fell in forty-eight hours, of which 58mm fell in twenty-four hours.

3 FEBRUARY 1945

Several areas were affected by flooding and slips as a result of exceptionally heavy rain. At Westport 76mm of rain was recorded overnight, and numerous slips came down on the road to Karamea. Considerable damage was also done to the road leading to the timber mills in the Seddonville district and in the lower Mokihinui, where flood waters entered some of the houses.

23 JANUARY 1946

Heavy rain brought rivers into flood and severe damage was done to the Ikamatua Sawmilling Co. Ltd.'s bridge across Rough River when several spans were washed away. In eleven hours 89mm of rain was registered at Greymouth, and at Rotomanu 165mm was recorded in the same period. At Rewanui 163mm of rain fell in twenty-four hours, and 107mm at Kaimata in the same period. At Greymouth some minor street flooding occurred, and at Runanga several properties were invaded. The Midland railway was damaged when a culvert overflowed at Nellies Creek. The Grey county suffered 2,676 damage to roads.

1 FEBRUARY 1946

A heavy downpour of rain caused further trouble at Nellies Creek, and overflows occurred on parts of the permanent way of the Midland railway. Slips also came down on the line in the area, but no other serious damage was reported.

15 - 16 FEBRUARY 1946

Although rain in the Grey district caused a number of slips, these were not of a serious nature. Considerable flooding, however, occurred in Hokitika and surrounding districts where 102mm of rain was recorded in twenty-four hours. The Hokitika River rose 4 metres above its normal level and was running at 6 m/s. Street flooding was general, and rowing boats formed the principal mode of transport in the main streets of the town. Many homes and business premises were entered by water, and damage was serious. Exit roads from the town were inundated. Considerable scouring of road surfaces took place. Rainfalls recorded in twenty-four hours included: Ross 157mm, Kowhitirangi 257mm, Whataroa 221mm, and Rimu 217mm.

12 - 13 AUGUST 1946

The whole of the West Coast was swept by a north-west gale accompanied by a severe electrical storm and heavy rain. The area experiencing the most severe storm was Otira, where 190mm of rain was recorded in twenty-four hours. The torrential rain was associated with a wind of cyclonic force, which ripped the roof off the Otira school, overturned a transformer house and railway huts, and tangled overhead wiring systems. In Greymouth the rainfall was much lighter, only 47mm being recorded in the twenty-four hours, and only minor damage was done by the wind. The Grey River was in moderate flood, although at Kaimata, where 58mm of rain fell in twenty-four hours, the Arnold River was in high flood. The most serious damage was the washing away of two complete spans of the combined road and rail bridge at Larrys Creek, north of Reefton. Numerous slips occurred on the Reefton-Westport line, and one occurred on the Midland line at Nellies Creek, near Jacksons. Both the Otira Gorge and the Lewis Pass highways were blocked by slips, but the interruptions were of only a short duration.

27 - 28 NOVEMBER 1946

After torrential rain the Grey River rose to a high flood, being only 1.8m from the top of the wharf, and it held this peak for five hours. At Brunner the peak discharge was 3540 cumecs, the velocity being 6 m.p.s. In twenty-four hours 57mm of rain fell at Greymouth, most of this falling four hours. Damage was done to the Midland railway through slips and washouts near Otira. At Reefton 81mm of rain was recorded in thirty-six hours, 59mm of this falling overnight, and 58mm fell at Waiuta in twenty-four hours, 83mm at Totara Flat, and 73mm at Murchison.

9 - 10 DECEMBER 1946

Continuous rain over two days caused little or no damage in the Grey district, but widespread flooding occurred in the Hokitika district. The Hokitika River was in very high flood, and large areas were inundated and many roads were blocked. At Greymouth over 76mm of rain fell in two days, with more than 57mm falling in twenty-four hours. Some local flooding occurred in the town. The Buller River was in moderate flood, and the peak discharge at the Rotoroa outfall was 120 cumecs. At Downertown 289mm fell in twenty-four hours, 140mm at Millerton and 59mm at Westport.

18 JUNE 1947

Heavy rain and hail, following an electrical storm, brought freshes to Westland rivers, but no damage was reported. Heavy snow fell on the divide. At Reefton 32mm of rain were recorded in twenty-four hours.

1 SEPTEMBER 1947

Backed up to a record height of 5m above normal low-water level by a sand-bank, the Hokitika River broke its banks and caused one of the worst floods in the recent history of the town. For several hours the water flowed in torrents into the low-lying business area of the town, turning the streets into miniature rivers and inundating shops and homes to depths from 30cm to 1m. In some shops the water almost reached to the level of counters, and heavy damage resulted. With the widening of an opening in the sand-bank, however, the water level rapidly dropped. At Hokitika aerodrome 1.3m of water flooded the hangars, offices, and waiting rooms.

Heavy rain with a gale-force wind struck Reefton but caused no serious damage. In twenty-four hours 43mm of rain was recorded, and the Inangahua River rose 1.2m above normal.

22 OCTOBER 1947

Country districts experienced heavy rain though little fell in the Greymouth area. The Arahura River was running bank high, and the Hokitika River was also at a high level, but no damage was reported from any area. At Karangarua 211mm of rain fell in twenty-four hours.

26 - 27 DECEMBER 1947

Heavy rain in the Alps brought much flooding to the West Coast, but only slight damage was reported from any district. At Greymouth 50mm of rain was recorded in twenty-four hours and a total of 61mm for the storm.

Other twenty-four hour falls included: Otira 198mm, Ross 84mm, Whataroa 149mm, and Jacksons Bay 138mm. Some surface flooding of the railway occurred at Inchbonnie, and slips blocked some roads. At Hokitika the river rose to within 1m of the wharf, and flooding occurred in the low-lying parts of the town.



16 JANUARY 1948

Heavy showers throughout the province caused some minor flooding, but no serious damage resulted. At Greymouth 30mm of rain fell in twenty-four hours. A large rock, apparently loosened by the heavy rain, fell on the railway line between Dunollie and Rewanui and damaged the centre rail. At Reefton the rain was heavier and 51mm was recorded in twenty-four hours. The Inangahua River rose 60cm above normal, and minor flooding was reported in various parts of the district. A few small slips also occurred, but no traffic was held up.

23 APRIL 1948

After a period of exceptionally dry weather heavy rain fell throughout the West Coast, a total of 44mm of rain being recorded at Greymouth in twenty-four hours, bringing the total for the month to 95mm. Some local flooding occurred in several streets of Greymouth, and the Grey River rose slightly and was flowing at 3m/s.

As a result of the heavy rain which fell for two days in the Buller district, the small township of Waimarie was almost submerged. The flooded Mokihinui River clashed with a rising tide and water backed up until the local hotel and nearby houses were inundated with 30cm of water. No stock losses occurred, however. The Buller River was also in moderate flood, but it caused no damage. At Westport 70mm of rain was recorded in twenty-four hours, and at Murchison 53mm fell in the same period.

30 MAY 1948

A period of wet weather reached its peak when a fall of 47mm was registered in twenty-four hours at Karoro. Surface flooding occurred in many localities around Greymouth, and the Otira Gorge road was closed. At Hokitika over 76mm fell in twenty-four hours, including 25mm in half an hour. At Rimu 83mm fell in twenty-four hours. Several houses in the town were flooded. The Hokitika River rose in only moderate flood.

19 JANUARY 1949

Widespread flooding in the Hokitika district, which resulted in fairly severe stock losses in the Kokatahi-Kowhitirangi district, followed heavy rain which fell over the whole of the West Coast. In Hokitika there was a good deal of street flooding, water entering some buildings, including the post office, and the river came to within 1.2m of the top of the wharf. The effects of the downpour were most severe in south Westland, where serious damage occurred to roads and bridges. Apart from a slight rise in the Grey River no flooding occurred in the Grey district.

23 FEBRUARY 1949

The Grey River, fed by heavy rain which fell over the length of the West Coast, came within 60cm of crossing the wharf and flooding Greymouth. The river flooded many properties in the Grey Valley, and stock losses were serious in some areas. In Greymouth parts of the town were flooded, but no serious damage was reported. The falls of rain in the back country ranged from 51mm to 229mm in twenty-four hours. At Hokitika the river rose and water backed up in some streets, but no damage was done. At Otira 229mm of rain fell in twenty-four hours, 73mm at Reefton, and 48mm at Greymouth.

General flooding also occurred throughout the Buller district following the very heavy rain. At Westport, 38mm of rain fell in twelve hours, and at Stockton the fall reached 220mm in fourteen hours. In twenty-four hours 160mm fell in the Buller Gorge and 56mm at Murchison. As a result all rivers were swollen, the Buller rising to a level approaching that of the 1926 flood. Roads were under water at several points, and considerable damage was done at Karamea. The

most serious flooding was at Mokihinui, where the river swept through the township to enter nearly every house, farm, and building. There was 230cm of water in the hotel. Damage to Murchison county roads totalled £1,530.

#### 5 - 6 OCTOBER 1949

Torrential rain accompanied by winds of gale force, brought all rivers and streams on the West Coast into high flood. At Greymouth 138mm of rain was registered in forty-eight hours, of which 91mm fell in twenty-four hours and 46mm in ten hours.

Other twenty-four hour totals included: Otira 307mm, Kaniere 222mm, Inchbonnie 225mm, Rewanui 145mm, and Ross 126mm.

The Grey River rose to a peak level of 1m from the top of the wharf, but no serious flooding occurred in Greymouth. Stock losses, however, were serious, particularly in the Grey and Taramakau valleys. Several roads were blocked by flood waters, the Otira Gorge road being impassable due to slips. At Hokitika some serious damage was averted when the river broke through a sand bar at the harbour entrance, enabling the water level to subside somewhat.

Heavy rain also fell throughout the Buller district and caused blockages on many roads. At Reefton 105mm of rain was recorded in sixty hours, of which 51mm fell in twenty-four hours, and at Downertown 263mm was recorded in twenty-four hours. The Inangahua River was in heavy flood and rose 1.2m above normal at the town bridge at Reefton. A slip caused a temporary blockage on the Lewis Pass road.

#### 25 - 26 DECEMBER 1949

Torrential rain, accompanied by an electrical storm, caused some flooding in the streets of Greymouth and Hokitika. At Greymouth more than 63mm of rain fell in three days. Most rivers were in high flood, and one person was drowned in the Taramakau River near Otira. Most of the damage reported was caused through the high wind which blew for a short period during the storm.

Considerable damage was also caused throughout the Buller district following the violent storm. A cloud-burst near Granity brought large stones down from the hillside. They fell on the roofs of houses below and caused serious damage. Three houses were flooded by water and silt when a creek overflowed. In the Buller Gorge a series of washouts blocked the road, and similar damage was done to the railway on the other bank. At Waiuta 40mm of rain fell in twenty-four hours.

#### 10 JANUARY 1950

Flood waters caused by heavy rain brought road and rail blockages throughout the district and caused interruptions to services over a short period. At Greymouth 57mm of rain was registered in twenty-four hours, of which two 51mm fell in twelve hours. The Grey River was in moderate flood flowing at 3m/s, but no serious damage was reported in the Greymouth area. The heaviest damage occurred in the Otira area when two slips came down in the Gorge. Several minor washouts also occurred. Slips occurred on other roads, and in Kumara flood waters stopped traffic. At Hokitika, where the river rose 3.5m above normal, 44mm of rain fell in twenty-four hours, and some low-lying business and residential areas in the town were flooded.

25 - 26 MAY 1950

Torrential rain, which fell over the whole of Westland and Buller, brought the rivers on both sides of the Alps into high flood. The rain was particularly heavy in the Otira area, where 406mm of rain fell in twenty-four hours and 812mm fell in four days. At Reefton 254mm fell in four days, and at Greymouth 72mm fell in twenty-four hours and 180mm in four days. Rainfalls (in millimetres) for twenty-four hours were as follows: Hokitika 110, Inangahua 184, Downertown 264, Otira 412, Greymouth 72, Reefton 99, Murchison 76.

The Grey River ran very high, being level with the top of the wharf at its peak. The river water did not flow into the town as in 1936, although water backed up in all the low-lying streets and invaded a few shops. At the peak of the flood the Hokitika River did not top its banks, but most of the business area was inundated by water, some shops and houses being entered. Rivers in South Westland were in high flood, some reaching record peaks. The Haast and Arawhata Rivers rose to approximately 60cm above the highest previous records, the discharge in the Haast being estimated at 7360 cumecs. At Haast the river overtopped its banks and flooded the airfield to a depth of "several feet". Damage to highways was widespread and severe. The old road bridge across the Taramakau at Kumara had two gaps 60m long torn in it, and many other smaller bridges were washed away. Numerous slips and washouts occurred, particularly in the Otira Gorge, where the road was blocked for several weeks. One man was killed when he fell through a bridge at Reefton. The railways suffered severe losses when 45m of the Blackball combined road and rail bridge over the Grey River collapsed, and the Waitahu combined bridge near Reefton lost a complete span and 12m of approach. The whole of Westland was effectively isolated, radio being the only means of communication.

In the Buller area rivers were very high, a gauging at the Berlins suspension bridge showing the discharge of the Buller River as 12460 cumecs from a catchment area of 5910 square kilometres. The Inangahua River at the Landing bridge was also gauged, the discharge there being 3540 cumecs from a catchment of 1004 square kilometres. The Maruia River at Higgins bridge was discharging 1910 cumecs from a catchment of 1020 square kilometres. These discharges did not, however, eclipse the previous records, though the 1950 flood level in the Inangahua River was about 30cm higher than in 1926 at Rotokohu and 60cm higher at Landing bridge where all the water is confined. The peak discharge at the Rotoroa outfall was 110 cumecs from a catchment of 383 square kilometres. The damage due to the floods was estimated at 150,000, including stock losses which were considerable. Grey county roads suffered damage totalling 1,527, and those in Inangahua county suffered to the extent of 3,455.

23 JULY 1950

Surface flooding occurred on parts of the West Coast following thirty-six hours of steady rain. At Greymouth 78mm of rain was recorded in twenty-four hours and 118mm in thirty-six hours, including 25mm in three hours.

Other twenty-four hour falls were: Inchbonnie 211mm, Kokatahi 196mm, and Kaniere 270mm.

A large slip came down at Aratika where the Midland line skirts the Kaimata dam. The Grey River rose somewhat but caused no alarm. Roads escaped serious damage, and, with the exception of the main road at Harihari, all were open.

9 DECEMBER 1950

Rain, which approached cloud-burst proportions in some areas, caused some damage in the Lake Brunner area. At Mitchells severe damage was done to the hotel, and road blockages

occurred in three places. At Greymouth just under 50mm fell in three days, but though creeks were in high flood no serious damage was reported in the area.

#### 28 DECEMBER 1950

Heavy rain brought flooding to most parts of the West Coast, but little damage was reported. In twenty-four hours 114mm of rain fell at Greymouth, 76mm at Hokitika, and 67mm at Reefton. At Whataroa in South Westland 267mm fell in forty-eight hours. Several slips and washouts occurred on roads in South Westland. The Hokitika River rose to within 60cm of the wharf, but it fell rapidly with the tide and only the lower parts of Hokitika were under water.

#### 28 MAY 1951

Greymouth experienced a brief but intense electrical storm in the late evening, and damage by lightning to installations at the Dobson diesel station and in other areas caused a power failure over the whole of the town district. At the height of the storm minor flooding occurred in low-lying parts of Greymouth, but the water quickly subsided. At Karoro 47mm of rain fell in twenty-four hours, of which 28mm fell in an hour during the storm.

#### 17 - 18 JULY 1951

Gale force winds and heavy rain brought all rivers in the Grey district into flood. For twenty-four hours 211mm of rain fell at Otira, and at Karoro 107mm fell in the same period. The Grey River rose to within 1.5m of the wharf at full tide, but it caused no damage. The Otira Gorge was blocked by slips, and surface flooding also blocked other roads, but no serious damage was reported from any district.

#### 28 - 29 NOVEMBER 1951

Heavy rain, particularly in the Alps, caused flooded rivers along the coast. The Grey River was particularly high, but it was well within safety limits, however. Roads throughout the district suffered somewhat from slips and flood waters, but no serious damage was reported. At Otira 159mm fell in twenty-four hours, and at Greymouth almost 38mm fell in the same period.

#### 30 JANUARY 1952

Heavy rain in the Alps did not bring the flooding which was anticipated, and the level of the Grey River did not rise a great deal above normal high tide. At Otira where 152mm of rain fell in five hours, Kellys Creek carried away telephone and telegraph lines as well as washing out both approaches to the bridge. At Greymouth only 12mm was recorded in the twenty-four hour period.

#### 10 - 11 MAY 1952

Some minor flooding occurred in the Greymouth area following two days of heavy rain, but no damage was reported. The Grey River was at a high level and several roads were awash. At Karoro 86mm of rain was recorded in forty-eight hours, of which 58mm fell in twenty-four hours.

#### 25 JUNE 1952

Heavy rain, accompanied by electrical storms in some areas, caused flooding, but no serious damage resulted. At Otira, where 127mm of rain was recorded during the day, damage was done to electrical installations and slips came down on several roads. The Taramakau River rose rapidly, and in South Westland, where the storm was the worst for some years, the Haast River rose 30cm in ten minutes at one period.

3 SEPTEMBER 1952

Flooding near the mouth of the Arahura River, north of Hokitika, occurred when heavy seas drove a shingle bank across the mouth and effectively blocked the outlet of the river to the sea. Farmlands were inundated, but no serious damage was reported.

17 - 18 OCTOBER 1952

The Waitangi River, swollen by three days' heavy rain, broke through the recently constructed stopbank on the northern side of the river on the main south highway beyond Whataroa, blocking traffic. At Whataroa 99mm of rain was recorded in twenty-four hours, with 162mm falling in forty-eight hours. A severe wind storm accompanying the rain, did some serious damage to buildings and structures in the area.

21 DECEMBER 1952

With 57mm of rain falling in twenty hours, of which 28mm fell in the morning, some minor flooding occurred in Greymouth, but no serious damage was reported.

26 MARCH 1953

Described by settlers at Whataroa as the heaviest rain they had ever experienced, about 432mm of rain fell in ten hours in South Westland. Rivers rose rapidly, and the northern approach to the Waitangi River bridge was washed out. The river changed course through the gap, and soon no water flowed in the normal channel. Slips occurred on several roads and traffic was interrupted.

18 APRIL 1953

As a result of very heavy rain the Hokitika River rose in high flood, and some low-lying areas in the town were temporarily flooded. The sand-banks at the mouth were soon scoured out, however, and the position was relieved.

29 - 30 APRIL 1953

Heavy rain in parts of the district brought flooding, and in one instance a house near Nikau was invaded and silt was deposited in the rooms to a depth of 20cm. Roads were impassable for a period because of flood waters and slips, but no other damage was reported.

13 MAY 1953

Widespread flooding occurred in Westport following a heavy and sustained fall of rain, in which 82mm of rain fell in twenty-four hours. In parts of the town the water was several centimetres deep, but no damage was reported. The Buller River rose considerably and was running at 5.5 m/s at Westport, peaking at 3640 cumecs at Berlins.

23 JULY 1953

Serious street flooding occurred in Greymouth following an early afternoon thunderstorm. Several streets were awash and heavy damage was done to gardens and footpaths. No premises were invaded, however, except one low-lying house.

24 NOVEMBER 1953

The heaviest rainfall for some time was recorded at Kowhitirangi when 114mm of rain fell in twenty-four hours, and at Haast 103mm was recorded in the same period. Flood conditions were experienced in this area, and the road to Jackson's Bay was blocked by slips and minor washouts. At Hokitika the river was in high flood, and minor surface flooding occurred in some parts of the town.

### 28 NOVEMBER 1953

Although over 51mm of rain fell in twelve hours, there was comparatively little damage to transport routes. Some surface flooding occurred in Westport, and in one area residents had some difficulty in getting to and from their homes. Further north, however, the Little Wanganui River overflowed its banks and flooded a large area of land. At Lake Rotoroa 76mm of rain fell in twelve hours, and 61mm fell at Murchison in the same period. The peak discharge at the Rotoroa outfall was 96 cumecs. The Mangles River rose 2.2m above normal in twelve hours at the gauging station. State highways in the district suffered damage totalling 1,320.

### 31 JANUARY 1955

Breaching a stopbank at the height of a flash flood, the Waitangi-taona River flooded much farmland and one house had to be hastily evacuated. In the Whataroa district 178mm of rain fell overnight and within hours the river was in high flood, rising from a near record low level to which the river had dropped as a result long dry spell. At day break the river was bank high; the velocity increased rapidly under the traffic bridge where the river is confined and struck the true left stopbank downstream. Within minutes the river had destroyed much of the bank. About 48cm of water entered the farm house that had to be evacuated and the main highway near Whataroa was cut by floodwaters. (G.E.S. 31/01/1955).

In Greymouth, 38mm of rain fell during the day. Slips closed the Midland Railway at 8.15 p.m. for five hours near Aickens and the Otira Gorge, and the traffic bridge over Rocky Creek subsided 254mm. Flood water on the railway in the Poerua, Rotomanu and Te Kinga districts had decreased sufficiently before it interfered with rail services. (G.E.S. 01/02/1955).

### 16 - 19 FEBRUARY 1955

Several days of heavy rain brought all rivers and creeks on the West Coast into flood. Between the 14th and 19th Greymouth received over 229mm of rain (G.E.S. 21/02/1955). At Inangahua 90mm fell in less than forty eight hours to the 17th. (The Press 18/02/1955).

Flooding in the Buller Gorge was the heaviest for several years (G.E.S. 21/02/1955). At low tide at midday on the 17th, the Buller River was flowing at about 4m/s. Many low lying areas were flooded, including the esplanade at Westport. The road between Inangahua Junction and Westport was blocked by slips and washouts near Berlins, as was the road to Nelson between Inangahua Junction and Lyell. The Buller Gorge Road was blocked at Husband Hill by slips. (The Press 18/02/1955). Flooding and slippages also caused trouble on the northern Karamea Road (G.E.S.18/02/1955) and the Lewis Pass road.

The Grey River was in high flood, flowing at 5m/s and coming within 48cm of overflowing the Greymouth Wharf between 5.00 a.m. and 6.00 a.m. on the 18th. However the danger of overtopping passed by midday (G.E.S. 19/02/1955). Sawyers Creek in Greymouth was running bank high for two days but no properties were flooded as the creek had been recently cleared of weed, allowing the flood waters to escape more easily (G.E.S. 18/02/1955).

Much damage occurred to roads and bridges throughout the Grey district. State Highway 7 between Greymouth and Reefton was closed by the washout of a span of the Big Grey River Bridge at the Ahaura end; a gap 2.1m wide developed between the road and the bridge and other spans of the bridge were weakened by the force of the water. The road between Ikamatua and Blackball was severed when the Craigieburn Stream Bridge was completely washed away (G.E.S. 19/02/1958) and at Taylorville the road was blocked by water 60cm deep. Rising creeks on the way to Runanga touched the bases of the road bridges but did not cross

the road in this area (G.E.S. 18/02/1955). The Otira Gorge road was cut by many slips and flooding.

In Greymouth heavy surface flooding occurred, being worst around the corners of Guinness, Herbert and Boundary Streets. Considerable flooding on Waterwalk Road isolated Blaketown for a period. The cellars of the Park Hotel were flooded and water lapped the doorway of Kennedy Brothers Garage. (G.E.S. 19/02/1955).

Railway links were also affected although not as badly as the road connections. On the night of the 18th the rail car in the Buller Gorge ran into a large slip, passengers had to cross the gorge via a swing bridge and were taken to Greymouth by bus, arriving six hours late. (G.E.S. 21/02/1955). The line from Greymouth to Christchurch was temporarily blocked by flooding and a power cable blown across the tracks between Cora Lynn and Cass on the Canterbury side. (G.E.S. 19/02/1955).

#### 25 - 27 FEBRUARY 1955

Widespread flooding, being particularly severe between the Buller and Hokitika Rivers occurred after three days of heavy rain. In twenty four hours to 9.00 a.m. on the 26th, 114mm of rain was recorded in Greymouth, following 25mm the previous day.

The Grey River rose rapidly on the night of the 25th and came within 60cm of the Greymouth Wharf at high tide at 1.00 a.m. on the 26th. As the tide dropped the river actually increased its level and peaked at noon 30cm below the Wharf, even though it hadn't rained for six hours. At its peak there was a 5m/s flow in the river on the 27th (G.E.S. 28/02/1955). Parts of the business district of Greymouth were flooded as silted water

#### 25 - 28 NOVEMBER 1957

A heavy spell of rain peaked on the night of the 26th - 27th, with Greymouth recording over 178mm of rain in one week. The brunt of the storm was concentrated around Blackball. The Grey River was in high flood, flowing at 4.5m/s, but was 2.4m below the Greymouth Wharf. Most other West Coast rivers were in medium flood, and twice during the week the Haast River ran bank to bank (G.E.S. 27/11/1957). The Aickens River was also running at danger level (G.E.S. 25/11/1957).

Parts of the Omoto Racecourse were flooded and both the railway and main highway were cut by flooding, washouts and slips in the Blackball/Ngahere region. The Balderstone and Party mine at Blackball was flooded when a creek burst its banks, and damaged the mines electrical equipment. Severe surface flooding occurred at Blackball, with torrents of water running down the main streets. This resulted in most roads in the Blackball-Ngahere-Redjacks area needing grading and remetalling. Much debris was strewn across roads and farms. (G.E.S. 27/11/1957).

At Matai, the lower bridge over Callaghans Creek was washed away and one house was flooded. The railway line between Matai and Ngahere was affected by slips. Flooding damaged newly developed farmland as silting occurred and fences were destroyed. A slip 100m long occurred on the Haupiri Road near Nelson Creek but was quickly removed. Despite the damage in the Blackball- Matai area, the Grey County in general suffered little (G.E.S. 28/11/1957).

#### 1 DECEMBER 1957

Flood danger levels were issued after the Grey river and other streams rose rapidly. The Omoto racecourse was partially submerged and at Matai where the worst flooding occurred, a homestead was inundated. Little damage was done and the Grey dropped as quickly as it rose. In the twenty four hours to 9.00am Greymouth received 38mm of rain (G.E.S 02/12/1957).

#### 4 - 5 DECEMBER 1957

Between 4.00p.m. and midnight on the night of the 4th, 63mm of rain fell at the Karoro Meteorological Station. The Grey River was running at 3.5m/s but did not rise as much as expected.

No major flood damage was reported although the heavy rain caused several washouts on the railway between Te Kinga and Rotomanu, and some surface flooding was reported in Greymouth when stormwater channels and drains overflowed. A number of slips blocked the Midland Railway line in the Otira - Aickens area for a short period. (G.E.S 05/12/1957).

#### 26 - 27 DECEMBER 1957

Intense rain caused all the major rivers in North Westland to flood, with the Grey River running at its highest level for approximately 18 years. The Ahaura River was 60cm above its previous highest level.

The Omoto Racecourse was flooded to the extent that water covered the railing around the back straight and was lapping the steps leading to the main stand. The Thomas Brunner memorial was being lapped and the Taylorville swing bridge was barely above river level. Deep water over the road at Stillwater cut off road access to Reefton and elsewhere in the Grey Valley. A protection groyne at Inchbonnie was washed away and considerable damage to several properties eventuated as most rivers and creeks were in full flood. The Crooked River flooded near Rotomanu leading to several hectares of farmland being inundated and pasture being damaged by silting. Blackball and Ngahere were flooded but no damage was reported. The business district of Greymouth was flooded by surface water. Water backed up through the drains as it was unable to escape due to the high level of the Grey River.

Damage was reported from further afield. The Taramakau River in high flood, washed away a 30m span of the Taramakau Road bridge between Kumara and Mitchells. It was feared that the Taramakau may have broken its banks and spilled into the Orangipuku River which leads into Lake Brunner, down the Arnold River and ultimately to the Grey River. However, this did not eventuate. The Otira River broke its banks and flowed through the middle of the village although water entered only one house (G.E.S 27/12/1957). The river waters broke the towns water pipes, scoured the streets and power transformers from the substation were destroyed. Residents had to carry water from the river until the water mains were repaired. (G.E.S 28/12/1957). The township was completely isolated as the railway and the gorge road were blocked by slips and the bridge approaches to the town were washed out. The highway remained closed for five months after the storm. Washouts occurred at five points. The road at Lake Misery (near the top of the pass) was under 3m of water. The Otira River bed aggraded between 6m and 8m and buried stretches of the highway. A large debris slide at Candys Bend wiped out a section of the highway, and at Goat Creek, near Otira, the bridge was buried under shingle (Whitehouse and McSaveney 1989). At Mirror Creek a 25m section of the main highway was washed out between Rimu and Ross and two spans of the Totara bridge were washed away (G.E.S. 27/12/1957).



### 23 - 24 JANUARY 1958

Heavy rain was recorded in the Grey Catchment on the 23rd and 24th. In twelve hours 127mm of rain was recorded at Greymouth whilst some rural areas received over 200mm in the same period. The major rivers did not flood but many small creeks broke their banks causing isolated damage.

Saltwater Creek was at its highest ever level as it lapped the decking of the one lane traffic bridge and flooded the area where it joins New River. New River broke its banks and invaded Camerons, flooding four houses and drowning some livestock. The road and rail south of Camerons was cut by flood waters as both ends of the Chesterfield rail bridge were scoured and the approaches to the bridge at Camerons were washed out. Other bridges also suffered. The approaches to Serpentine Creek bridge were washed away, as were two spans of the Kaniere River bridge. Both approaches to the Dry Creek bridge vanished and the bridge at Smith Creek on Weka Hill was washed away completely.

In the twenty four hours to 9.00 am on the 24th, 216mm of rain was registered at Hokitika, (G.E.S 11/03/1967), resulting in major surface flooding as water from Aerodrome Hill flowed into the lower parts of the town and the high level of the Hokitika River prevented the town's drainage system from working. The Hokitika water supply was cut due to flood damage to the pipe near Lake Kaniere. Surface flooding also occurred in Greymouth, Cobden and on the Kaiata highway. No further damage was reported (G.E.S. 24/01/1958).

### 14 FEBRUARY 1958

Intense rain during the night (152mm in six hours) caused many slips in the Cobden/Greymouth area. Fresh slip scars channelled rain water into rivulets and combined with the surface flooding, inundated the shopping area to an unprecedented extent, except for when the Grey River burst its banks. Sawyers Creek burst its banks and flooded many properties although no damage was reported.

Mud and silt from numerous slips was deposited over a wide area in Greymouth and Cobden and slips destroyed a number of sheds and damaged two houses (G.E.S. 15/02/1958).

### 13 MARCH 1958

The period of bad weather continued and much of Westland was flooded for the second time within a week.

The Grey River rose rapidly overnight and threatened to overtop the wharf and flood the commercial centre of Greymouth in the early hours of the morning but this did not eventuate as the flood peaked just below the level of the wharf. However, many streets were flooded and silted as water backed up through the towns drainage system. Mud also came down from the hill above the railway station as temporary streams flowed down the slip scars created in February's event. Many hotel cellars in Greymouth were flooded, having to be pumped out by the Fire Brigade and much of Blaketown was flooded as the lagoon overflowed. At Omoto floodwaters lapped the inside rails of the race track and horses had to be released and lead through water over a metre deep, to higher ground. At Mitchells several slips caused much damage to a number of cars (burying three of them), and several houses.

Farmland in the Kokatahi-Kowhitirangi area, and between Hari Hari and Whataroa was again severely flooded with similar result of the previous flood occurring (G.E.S 14/03/1958). The

Waitahu River broke through its banks at the road/rail bridge and flooded some farmland although no serious damage was reported. (G.E.S 15/03/1958).

Every major road and railway on the West Coast was blocked by a combination of floodwaters, slips and bridge damage resulting in many small settlements being completely isolated. The Otira River was in high flood with the railway there being blocked by floods and slips in six places around Otira township. State Highway 6 in South Westland had not been opened since the flood on the 9th - 10th. This prohibited dairy farmers in the area dispatching their cream away to the factories. The cream was stored in a freezer at Whataroa, but floods put the freezer out of action and 8 tonnes of cream was destroyed. At the Glaciers a large number of tourists had been stranded there since the 10th, and many cars were stranded in scattered locations throughout Westland. (G.E.S 14/03/1958).

#### 9 - 11 AUGUST 1958

On the 9th Greymouth received 92mm of rain, Blackball 135mm and Arthurs Pass 210mm respectively. Roads around Hokitika were flooded and blocked and the Nelson Highway south of Inangahua Junction was blocked. Surface flooding was general in Greymouth, being severe in some places. The Grey River rose rapidly but the rain eased off before the river flooded the town. Flooding was generally more of a nuisance than damaging (G.E.S. 11/08/1958).

Farmlands at Totara Flat were almost completely submerged when the Big Grey River broke its banks. Thirteen farms were affected and many homesteads were surrounded by water. Melting snow and heavy rain brought the Big Grey into high flood and broke its banks about 1500m from the new rail bridge south of Ikamatua. The river flowed right through Totara Flat, destroying fences, buildings and cars. The current was not strong but water was about 1m deep. The church was surrounded by water, as were some houses although water didn't enter any (G.E.S. 12/04/1958).

#### 3 DECEMBER 1958

A flash flood occurred in the Taramakau Valley after a period of heavy rain. In the forty eight hours to 9.00am on the 4th, 58mm of rain was recorded at Karoro. Of this, 55mm fell in the twenty four hours to 9.00am on the 3rd.

The flood in the Big Honohu River carried away a 10.6m pile driving frame, timber and other equipment 300m downstream. This delayed work on the new bridge for about a fortnight. It was suggested that the Big Honohu was near its maximum flood level. New River carried a large volume of water and broke its banks near Camerons, to flood the main highway between Greymouth and Hokitika to a depth of 60cm to a metre and for a length of 90m. This caused a traffic jam involving 129 vehicles. The road was scoured to a considerable degree, resulting in 500 of damage, but this was quickly repaired. (G.S.E. 04/12/1958).

#### 27 - 28 MARCH 1963

Between the afternoons of the 27th and 28th, Otira received between 300 - 355mm of continuous and torrential rain. The Otira River was in high flood and the Taramakau and Grey and Hokitika Rivers were greatly swollen. Many small creeks also flooded heavily.

Serious flooding and slipping occurred on many roads throughout Buller/Westland - particularly the Otira Gorge Road. Blocked roads occurred from Karamea in the north to Fox Glacier in the south. Severe slippages also affected the road between the glaciers.

In twenty-four hours to 9.00a.m. on the 28th, Blackball received 130mm of rain. The Blackball Creek overflowed and was lapping the deck of the bridge on the Ngahere/Blackball road. Between Blackball Hill and the railway, water covered the road in four places and was about 8cm deep over the bridge on Blackball Creek. Water covered the road between Blackball and Roa in five places. A house in Blackball had to be evacuated and two more were threatened with flood waters. The Kotuku/Bell Hill and Mitchells/Inchbonnie roads were blocked and the Moonlight/Atarau road was closed because of washed out bridge approaches. The railway line between Greymouth and Christchurch was also blocked by water and slips. Rocky Creek was in heavy flood, leaving a number of rocks on the lines about 1.6km on the Greymouth side. Flooding was also reported on the Birchfield road between Westport and Ngakawau and minor slips occurred around Westport (G.E.S. 28/03/1963).

#### 29 - 30 OCTOBER 1963

Heavy overnight rain brought the rivers of North Westland into flood. In twenty four hours to 9.00 a.m. on the 30th, 80mm of rain was recorded at Blackball, 47mm at Karoro and 52mm at the Greymouth Harbour Board.

The Grey River at Dobson was 3m above normal and flowing at 4.5m/s. Kaiata and Omoto were flooded extensively as the Grey backed up through a small creek adjacent to the Jockey Club's property, and flooded the southern end of the back straight of the race course. (G.E.S 30/10/1963). About 200 sheep at Omoto were drowned. (G.E.S 31/10/1963). In Greymouth, fishermen had to shift their boats from the Wharf into Erua Moana Lagoon because of the high state of the river. The road/rail bridge at Blackball was closed due to a suspect pair, which halted both road and rail traffic until the river dropped and the bridge was inspected. (G.E.S 30/10/1963). A telephone pole near Atarau was washed out, cutting phone links in the Atarau-Moonlight district. (G.E.S 31/10/1963). The river was reported to have risen very quickly.

Further afield the Taramakau and Arahura Rivers were also high although no damage was attributed to them. (G.E.S 30/10/1963).

#### 5 - 6 NOVEMBER 1963

Heavy stock losses occurred in the Arapito and Umere Valleys and Karamea as a result of heavy flooding in the Buller region. Sheep, cattle and pigs were all lost. At Seddonville stock losses were light, but water entered several houses on the 6th, resulting in two families having to be evacuated by boat. Water was about a metre deep in one of the evacuated houses and 1.2m deep. Several people took refuge in the Empire Hotel which itself became an island and could only be reached by boat.

The flood in the Grey River reached its peak between 9.00 p.m. and 9.30 p.m. on the 6th. Recordings show the river flowing at 5663 cumecs, 4.6 m/s and 4.6m above normal height. However, by midnight the river had dropped 45cm. Extensive surface flooding occurred in Greymouth as water backed up through the drains, and a slip blocked the Rewanui coal mine railway line.

In thirty six hours to 9.00 a.m. on the 7th, Greymouth received 101mm of rain. (The Press 09/11/1963).

#### 13 - 15 MARCH 1965

Between Saturday 13th and Monday 15th, 610mm of rain were recorded at Paringa. Of this 203mm fell on Saturday (13th) and 407mm fell between Sunday morning (14th) and mid day Monday (15th).

At Lake Moeraka a bridge approach was washed out and a huge landslide came down near the lake. In the Weka Hills between Fox and Franz Josef several slips occurred and an approach to the Bullock Creek bridge was washed out, blocking the road (G.E.S 15/03/1965)

#### 18 MARCH 1965

A house and surrounding low land, was flooded with 15cm of water, when the Porarari River backed up against very high seas. According to the house owner, this was at least the fourth time this type of flooding had happened in three years.

The high seas also flooded the streets in Waimarie township. however no buildings were flooded and no damage was reported. (G.E.S 18/03/1965).

#### 15 - 16 FEBRUARY 1967

Heavy rain caused minor problems in South Westland and Otira. The Wanganui, Poerua and Waitaha Rivers were in "decent flood". The Otira Gorge was cut in two places with a slip at Deception Point and floods at Kelly's Creek. Slips also occurred in the Upper Buller Gorge and Weheka Hills and scouring on the Kumara/Mitchells Highway put the road out of action for a short period (G.E.S. 16/02/1967).

#### 24 - 25 JANUARY 1967

Extremely heavy rain fell for three days bringing all rivers south of the Grey into flood. In seventy two hours to 9.00 a.m. on the 25th, daily rainfall recordings for Paringa were 187mm, 83mm and 258mm respectively. In twenty four hours to 9.00 a.m. on the 25th, Fox received 136mm of rain and Harihari 145mm.

Thousands of pounds worth of damage resulted. The Bailey Bridges over Mossey and Douglas Creeks were damaged and the Fox River Bridge (South Westland) was closed as the hangers became unsafe. Many culverts and fords were badly damaged in South Westland and the highway at Boulder Creek was closed because of floodwaters. At the Waiho River about 320m of stopbank was washed away and a large slip of about 1500 cubic metres blocked the main highway south of the Whataroa River Bridge.

The Grey River flooded low lying land at Matai, Ahaura and Totara Flat, although no damage was reported. Some flooding of the railway occurred at Camp and a slip blocked the line at Requanui. In Greymouth, Sawyers Creek burst its banks and flooded some Marlborough Street and Marsden Road properties. (G.E.S. 25/01/1967).

#### 30 JANUARY 1967

The Haast Highway was closed for the second time in a week after 165mm of rain fell in twenty four hours to 9.00 a.m. on the 30th at Haast.

At Moeraki Bluff between Paringa and Moeraki, debris and gravel spilled out onto the highway causing blockages. At Boulder Creek, water diverted by debris and rocks flowed down a channel further to the north which cut across the main road.

A bridge at Mossey Creek was completely washed away. (G.E.S. 30/01/1967).

#### 10 - 12 MARCH 1967

Storm conditions brought heavy rain to a widespread area of the West Coast. In twenty-four hours to 9.00a.m. on the 11th, Blackball received 175mm of rain, Hokitika received 166mm in forty-eight hours and Greymouth had 41mm in one hour.

The Hokitika River had its worst flood for nine years as the river ran bank high and many low lying areas were flooded. However, this was mainly surface flooding. The Hokitika River broke its banks at the Lower Kokatahi area and access to the farming district was cut. The Hokitika/Ross railcar was stopped because of floodwaters, and the highway from Kanieri had water over it for 3km. (G.E.S. 11/03/1967). A number of cattle drowned in the swollen rivers, especially the Hokitika. The Kokatahi River was at its highest since 1935 and river waters entered several homes at Lower Kokatahi - the first time in living memory.

The Waitangi-taona river overtopped and breached a stopbank just downstream of the State Highway bridge (McKie et.al.1983). In doing so, the river changed from one side of its alluvial fan to the other, and took a radically different course to the sea, via Lake Wahapo (6km away), Zalas Creek, Okarito River and the Okarito Lagoon, on the way it flowed through a flourishing stand of Kahikatea, killing a large number of trees by raising the water table around their roots, covering the forest floor with gravel, and developing new channels through the stand; It changed Lake Wahapo from a clear to a turbid Lake, while the greatly increased outflow from the lake began seriously to erode the river bank, along which the main road ran, at the point where it joins Zalas Creek. (Soons, 1982). The main Haast highway was closed at Havelock's Creek, as the creek flooded the road. In this area 203mm of rain fell in the twenty four hours to 9.00 am on the 9th (G.E.S 09/03/1967).

The Grey River was 45cm from the wharf top and damaged the wharf in several places. Shoaling in the Grey River meant the loss of months of dredging work and the Blaketown Lagoon overflowed onto Airport Road and onto the airport itself (G.E.S. 13/03/1967). Severe surface flooding occurred in Greymouth and Sawyers Creek lapped the backs of low lying houses. At Redjacks, houses were also surrounded by floodwaters. (G.E.S 11/03/1967), and the whole of the Coal Creek Flat was flooded (G.E.S 14/03/1967).

In many places road and rail links were cut by floodwaters and washouts. The Otira Gorge was closed due to flooding at Harris's Swamp and scouring at several other places. The Upper and Lower Buller Gorges were also blocked temporarily due to slips (G.E.S. 11/03/1967).

#### 24 MARCH 1967

Sixteen people of the West Coast Alpine Club were stranded on their way to Welcome Flat (up the Copeland River Valley), when they were caught between two streams which rose very quickly after heavy rain. Although they had to spend the night in the open, no one was hurt (G.E.S. 31/03/1967).

#### 1 - 2 APRIL 1967

Heavy rain caused the closure of the Upper Buller Gorge road in the Newtons Flat vicinity on the 1st and 2nd. Minor washouts occurred on other roads. The railway between Fairdown and Birchfield had several sections washed out; 19km from Westport water cut a trench 2m deep by 36m wide. This was the worst flood damage on the Buller-Seddonville line for a number of years. (The Press 03/04/1967).

#### 7 - 8 APRIL 1967

Heavy rain on the 7th and 8th caused some scouring of the railway between Greymouth and Otira. Rivers rose but dropped rapidly on the cessation of rain. In twenty four hours to 9.00 a.m. on the 8th, Greymouth received 119mm of rain. Damage was minimal. (The Press 10/04/1967).

24 - 25 JUNE 1967

Rain over the weekend caused a fresh to run in the Grey River. It was hoped that the fresh would scour the bar at the mouth which was shallow at the time, but this did not happen. No damage was reported. (G.E.S. 27/06/1967).

2 - 4 JULY 1967

A long dry period was broken by a storm which brought severe flooding to South Westland. In twenty two hours to 9.00 a.m. on the 3rd, 254mm of rain was recorded at Franz Josef, 41mm of rain was recorded in Greymouth. (G.E.S 03/07/1967) and 76mm was registered at Inangahua in twenty four hours. (G.E.S 04/07/1967).

State Highway 6 11km south of Whataroa was closed as about 60cm of water covered the road; the Waitangi-toana River flowing into Lake Wahapo since the March 1967 flood, overflowed onto the road and the river itself also flooded the road at another point. At the latter site the road was badly scoured. About 800 worth of damage was done to the Amethyst Power Board's facilities (G.E.S 04/07/1967). Over 1km of power lines situated in the Waitangi-taona River bed were washed away and the power house on Amethyst Creek was undermined. (G.E.S 03/07/1967). The powerhouse was isolated as the 12m access bridge at Okarito forks was washed away at 5.45 p.m. on the 2nd. Power was cut between the forks and Docherty's Creek a distance of 24km. (G.E.S 04/07/1967). A family were stranded in their house at Okarito forks for a number of days as they used the same access bridge as the power house - a wire cable had to be strung across the Okarito River to provide the family with essential supplies. A farm adjacent to the Whataroa River was severely affected by the flooding. About 162 hectares out of 178 hectares was submerged. Gravel covered many of the paddocks to a depth of 1.8m. The river had taken a new channel across the farm and cut rapidly into the newly formed section of State Highway 6. (G.E.S 05/07/1967).

In North Westland and Buller damage was minimal. Apart from Sawyers Creek being high and some shallow surface flooding in the streets, there was no sign of flooding in Greymouth. A 1.5m/s velocity was recorded in the Grey River in the early morning of the 3rd and this had increased to 3m/s by 11.00 a.m. (G.E.S 03/07/1967). A few small slips occurred in the Buller Gorge although no flooding was reported. (G.E.S 04/07/1967).

17 NOVEMBER 1967

All the Westland/Buller rivers were in moderate/high flood after twelve successive days of rain. The Buller River was worst affected running at 5660 cumecs. The Maruia River cut two large trenches in State Highway 7 between Maruia Springs and Reefton. In the Lower Buller Gorge the deck of a Bailey Bridge across the Ohikanui River was 1.2m underwater for several hours and State Highway 6 at Lake Wahapo was under 1.5m of water. At Dobson the Grey River was 3.6m above normal level. Little damage was done although telecommunications were cut by a slip at Deception Bend. Greymouth had received 222mm of rain in twelve days (G.E.S. 17/11/1967).

17 - 18 JANUARY 1968

During the night of the 17th, 54mm of rain was recorded at Greymouth and the Grey River rose 3.6m. However, only minor surface flooding occurred and numerous minor slips closed the Brunner/Blackball Road for a couple of days. Also closed were the Arnold/Stillwater railway and the Rewanui Incline (G.E.S. 18/01/1968).

8 - 10 FEBRUARY 1968

After a number of days of heavy rain the Grey River rose in a "flash flood" on the 9th. The centre pier of the Blackball bridge was moved 1.2m downstream, thus closing the bridge to all traffic. A number of stock were also lost in the area.

In the Buller district, 42mm of rain fell in twenty four hours up to 9.00a.m. on the 9th causing flooding in the Karamea, Hector and Seddonville areas which, disrupted road traffic. The Mokihinui River was in its highest flood for a number of years, reaching 1.5m from the bridge level before it broke its banks and spread over a couple of properties. Seddonville was cut from the main highway for a number of hours when a road near the township was heavily flooded. At Little Wanganui near Karamea, the road was flooded up to 60cm deep and Westport's water supply was cut because of silting in the reservoir (G.E.S. 10/01/1968). The bridge over Dirty Mary Creek collapsed on the night of the 8th and piles were scoured at the Mai Mai Creek bridge (G.E.S. 8/02/1968).

29 FEBRUARY 1968

Heavy rain during the night caused surface flooding and scouring in several places. No damage was reported from Greymouth, Westport or Hokitika, but near Mitchells a large slip and several washouts blocked the road. The old Waitangi River bridge lost three 18.5m spans and bridge approaches at McCullochs Creek near Whataroa were washed out. The rail embankment was scoured between Jacksons and Aickens and several slips blocked it at other places. Bridge approaches were scoured at the Poerua/Rotomanu area and the track itself was scoured between Rotomanu and Te Kinga (G.E.S. 29/02/1968).

9 - 12 MARCH 1968

High winds and heavy rain brought some surface flooding to Greymouth but caused no damage. All damage reported was due to wind (G.E.S. 09/03/1968). Minor flooding of the Grey River slowed repair work of the Blackball bridge, and floodwaters washed away a span of the old Waitangi River bridge (G.E.S. 13/03/1968).

9 - 10 APRIL 1968

The "Wahine Storm" caused much damage to road and rail links on the West Coast. Greymouth recorded 53mm of rain in one hour. Many residents suggested the Grey River was at its highest level in memory (G.E.S. 09/04/1968). Recorded levels show the Grey River was discharging 5100 cumecs and was 5.4m above normal levels. The Hokitika River was 5.4m above normal at the Kaniere bridge and flowed at 3,030 cumecs. Sawyers Creek was at its highest level ever, at 2.9m and discharged 70 cumecs. The Mawheraiti River was also reported by residents to be at its highest ever level. The Inangahua River was in heavy flood although no damage was reported from it. Other rivers in flood were the Taramakau, Kaniere, Kokatahi, Waitaha and Poerua. All flooded rivers except the Inangahua damaged stopbanks and groynes (W.C.B. File 375). Four spans of the Totara bridge were washed away and residents suggested floodwaters there were the highest ever (G.E.S. 09/04/1968). Spans of the Blackball bridge were washed away and the whole of the rail track at the end of the Kaimata tunnel fell into the Arnold River. Bridge approaches were washed out between Ahaura and Kopara and the bridge at Bell Hill was washed away completely (G.E.S. 10/04/1968). Approaches to the Canoe Bridge were also washed out. Cemetery Creek and Sawyers Creek both overflowed and flooded parts of Reefton and Greymouth respectively. Greymouth, Cobden and Runanga all received severe surface flooding and slipping. The Denniston escarpment mine was badly damaged by a creek bursting its banks and flowing into the mine (G.E.S. 09/05/1968). The Brighton Coal Mine was written off

as water and silt swept away all the surface buildings and plant equipment. New road seal at Dobson was destroyed by upwelling from an underground stream.

Although most of the major rivers caused relatively little damage, Ahaura and Totara Flat were severely inundated by the Grey River. The railway in this area was hit severely by slips (G.E.S. 10/04/1968).

#### 6 MAY 1968

Surface flooding occurred in the Greymouth area as the result of heavy rain produced by a thunder storm. In twenty four hours, Karoro received 29mm of rain and Greymouth Harbour recorded 31mm.

Slips produced by the April storm were re-activated, one which blocked the Cobden Railway line. Little damage was reported (G.E.S 06/05/1968).

#### 24 - 25 MAY 1968

The upper Buller River rose considerably after it was blocked by a huge slip triggered by the Inangahua Earthquake. The rock avalanche blocked the river 3km upstream of Lyell. Material on the south bank was brought down from a height of over 600m and was carried about 50m up the north bank.

The river backed up and formed a lake behind the dam, until it eventually broke through. Reports from the Ministry of Works indicated that the river was blocked from 4.30pm on the 24th until 1.00am on the 25th (Adams et al 1968).

#### 22 - 23 OCTOBER 1968

A north-west storm brought heavy rain to most of the West Coast. Rivers rose to moderate high levels with the Mawheraiti at Ikamatua rising 2.1m above normal and the Ahaura River 7.3m. The Hokitika River was also in high flood and parts of Hokitika's business district and lower lying streets were flooded by surface water. Minor slips occurred on road and rail links but these were cleared quickly (G.E.S. 23/10/1968).

A 'cloudburst' over the Cascade Mine caused ground shattered by the Inangahua Earthquake to slump and block Cascade Creek; water backed up and flooded the mine causing about \$20000 worth of damage. Bins, a compressor, electric pumps and other equipment was lost. (G.E.S. 24/10/1968).

In the twenty four hours to 9.00 a.m. on the 23rd, the following rainfall recordings were made: Greymouth 51mm, Otira 201mm, Hokitika 88mm, Milford South 220mm. From the Greymouth total, 33mm fell in two hours and from the Hokitika total, 58mm fell in three hours. (G.E.S. 23/10/1968).

#### 28 - 30 OCTOBER 1968

The second "peak" in a week of stormy weather occurred as the Grey River had been running bank to bank or overflowing its banks since the 23rd (G.E.S. 28/11/1968). At Dobson the river was 5.6m above normal and was only a "few feet" below the Dobson memorial on the island between Dobson and Taylorville. The Omoto Racecourse was flooded to the extent that tops of the power poles were only 1.5m above the water. Houses at Ikamatua and Ahaura were flooded as the Big Grey held its peak for a number of hours and lower parts of Greymouth were affected by surface flooding.



Only the Westport/Greymouth road remained open out of Westport as all others were closed because of flooding or slipping. The Upper and Lower Buller Gorges were closed as flooding covered the road. At Fenwicks the road was covered with about 2m of water. Rail and road links throughout the area were cut by flood waters and slips. At their peaks, both the Buller and Grey Rivers were running at 5m/s (G.E.S. 30/10/1968). The most inconvenient damage during the storm was to telecommunication links, done by high winds and not flood waters.

#### 8 NOVEMBER 1968

Heavy rain produced surface flooding over a wide area. During the night Hokitika received 76mm of rain and winds up to 65 k.m.h. The southern approaches to the Ford Creek Bridge just south of Blackball were washed out cutting off access to the township except via Ikamatua.

On the Otira Highway water was up to the road at Harris's Swamp and in Greymouth water was over the footpath at Whall Street and at the Sawyers Creek end of Shakespeare Street. Surface flooding due to stormwater backup occurred in Leonard Street and on the town side of the Cobden bridge (G.E.S. 08/11/1968). Minor damage was reported to river protection works from a number of areas (W.C.B. File 395). In the Fairdown and Granity areas a number of creeks overflowed onto the road and railway although they remained open. (W.C.B. photographs).

#### 25 DECEMBER 1968

Floodwaters washed out 80m of recently constructed stopbank on the Little Man River (Dry Creek), exposing a house and the State Highway to flood waters. No other damage was reported (W.C.B. File 375).

#### 13 APRIL 1969

Inchbonnie received 168mm of rain in twenty four hours causing the Grey River to rise 5.8m above normal at Dobson. Flooding at Stillwater bridge closed the main road and other county roads were also closed due to flooding and slips. Surface flooding occurred in Greymouth but no damage was reported. Further up the valley some cattle were washed away and minor damage occurred to river protection works. The most serious damage reported was that of a 90m section of the newly constructed Blackball foot bridge washed away on the Ngahere side (G.E.S. 14/04/1969).

The Inangahua River rose 3.9m above normal which was considered to be the largest flood for many years although no damage was reported. (W.C.B. File 375).

#### 6 SEPTEMBER 1969

Gale force winds and driving rain struck Westland. In South Westland the storm was considered the heaviest since 1958. Harihari recorded 267mm of rain in just over twenty two hours, and Fox Glacier and Franz Josef recorded 297mm and 341mm of rain respectively in twenty-four hours.

All rivers were in high flood - there was a 4.5m/s run in the Grey River and an 5.5m/s run in the Buller River. The Inangahua River was only about 30cm from the road in many places (G.E.S. 08/09/1969). The Hokitika River breached its banks near Grove Swamp and flooded Mirror Creek. This cut through "remarkable gap" to Lake Mahinapua and on the way completely flooded the road 16km south of Hokitika, cutting a gap 30cm wide and 3 to 4.5m deep. Lake Mahinapua rose about 2.4m.

The Taramakau River was very high and washed away several whitebaiter's huts along its southern bank as well as some nets and at least one rowing boat. Many roads were closed right throughout Westland due to flooding and slips (G.E.S. 09/09/1969).

#### 22 JANUARY 1970

Torrential rain in many parts of Westland caused rivers to rise although little damage was reported. Rainfall recordings for the twenty-four hour period to 9.00a.m. on the 22nd were: Hokitika 75mm, Otira 174mm, Haast 30mm, Franz Josef 197mm.

Low lying parts of the Hokitika Central Business District were flooded and water over the rail lines near the station delayed train movements for a short period. The Grey River was swollen and muddy and running at 2.5m/s. Many creeks rose rapidly. Much surface flooding was reported from Greymouth and the Grey Valley, with Coal Creek being in heavy flood (G.E.S. 23/01/1970). The Camelback groyne which forms an integral part of the Hokitika River/Kowhitirangi Flood Control Scheme was badly damaged as 100m of bank was washed away by the Hokitika River. Flood damage was also reported to protection works at the Poerua and Little Man Rivers (W.C.B. File 375).

#### 6 - 7 MARCH 1970

Heavy rain and swollen rivers in South Westland caused moderate damage to river protection works on the Totara, Waitaha and Arahura Rivers (W.C.B. File 375). Flood damage was not reported from elsewhere.

#### 9 - 10 MARCH 1970

Minor flooding occurred in the Grey and Buller Rivers. The Grey was running at 2.5m/s. Sawyers Creek was high on the 9th and approaches to the new Preston Road Bridge were severely scoured. In the Lower Buller Gorge scouring halted traffic as did slips in the Upper Buller Gorge (G.E.S. 10/03/1970).

#### 31 AUGUST 1970

A north-easterly storm affected the whole area from Nelson to Fiordland. Winds gusted up to 112 k.m.h. and heavy rain fell for a number of days causing widespread flooding. The Grey River peaked at 6.4m and flowed at 4,820 cumecs (W.C.B data) causing the most serious flooding since 1936. In the preceding six days 152mm of rain fell in the Grey Catchment area (G.E.S. 31/08/1970).

In Blaketown and Cobden the extent of flooding was similar to that of 1936 where flood levels were controlled by backwater from the lagoons and many homes were flooded. In the central business district of Greymouth flood levels were considerably lower than 1936 probably because of the railway embankment acting as a stopbank. This bank was grouted in 1936. Sandbagging along the wharf between the Commercial and Richmond Hotels also helped keep flood levels reduced (W.C.B. File 375).

Transport links with Greymouth were cut completely. The Stillwater bridge was totally submerged and water lay over 1m deep on parts of the road. At Wingham Park the road was blocked by deep water as was State Highway 73 at Harris's Swamp. Rail links to Greymouth were blocked by slips at Otira, Aickens Railway Station and between Greymouth and Westport. Floodwaters from the Taramakau River also blocked the Otira line (G.E.S. 31/08/1970).

The Buller rose to reach the top of the arch at Hawkes Crag but this was nearly 3m lower than the 1926 flood. At Berlins the water line was about 2.5m below the level of the road which was also about 3m lower than 1926. A discharge in the order of 7,080 cumecs flowed down the Buller at Te Kuha, and about 140 cumecs flowed down the Orowaiti overflow to the north of Westport. This overflow saved the town from serious damage. At Te Kuha the Buller rose 11m (W.C.B. File 375). Links to Westport were limited. The Upper and Lower Buller Gorges were cut by flood waters and slips, as was the Westport/Airport/ Cape Foulwind Road. The most serious problem in the district was the washout of the Waimea Bridge in the Karamea area, this isolating Karamea for some time.

The Inangahua River was in high flood and broke its banks at Perseverance Bridge. From the bridge right down to Rotokohu the right bank area was flooded from the river to the railway embankment (i.e. State Highway 6 was flooded). Flood waters backed up through the rail and flooded down the east side of the rail embankment and came out at the first bridge north of Landing Creek. Return flow damaged the downstream shoulder of the main highway. At Blacks Point the river peaked at 3.2m. In Reefton several houses had to be evacuated. The Maruia River, in major flood suffered much erosion to the banks along its length, but little damage was reported to river works although some repairs were necessary (W.C.B. File 375).

At Hokitika 122mm of rain fell in forty eight hours bringing the Hokitika River into high flood, resulting in lower parts of the town being flooded although no serious damage was reported (G.E.S. 31/08/1970).

#### 17 SEPTEMBER 1970

Heavy rain associated with northerly winds flooded the West Coast rivers to levels similar to the August 1970 flood. The Grey River at Dobson peaked at 6m (W.C.B. File 375) and 4.1 cumecs (W.C.B. data). In Greymouth the water was 30cm off the top of the wharf and extensive flooding again occurred in the lower part of the town.

In the Grey Valley the Ahaura River peaked at 6.9m (compared to 7.1m on 31/08/1970) at the State Highway 6 bridge, the Grey River at the State Highway 6 bridge peaked at 1.9m (compared to 1.9m on 31/08/1970) and the Mawheraiti peaked at 2.2m (compared to 2.7 on 31/08/1970). Damage was more widespread in September being aggravated by the breaching of protection works by the August flood (W.C.B. File 375). In the Grey County, State Highway 7 at Stillwater was flooded to the level of the hand rails on the bridge and the roads around Mitchells and the Stillwater/Moana Road were extensively flooded. (G.E.S. 17/09/1970).

Major damage included breaching of 160m of stopbank of the Big Wanganui River and floodwaters covered a large area of farm land before returning to the river channel via La Fontaine Stream. The major hook groyne at Atarau was breached and the Inangahua River again overflowed at Perseverance Bridge, enlarging the flood channel (W.C.B. File 375). Many lambs were lost in South Westland (G.E.S. 17/09/1970). The Buller River continued to attack protection works at Organs Island so that Westport was left open to major flooding (W.C.B. File 375), and the Lower Buller Gorge was closed for a short period because of floods and slips. Deep water also blocked the road at Harris's Swamp and a slip blocked the road at Wingham Park (G.E.S. 17/09/1970). Moderate damage to protection works occurred in both the August and September 1970 floods (W.C.B. File 375).

2 - 3 OCTOBER 1971

Moderate flooding occurred throughout Buller and Westland with Buller being worst hit. More than 100mm of rain fell in two days in the Buller area. The Buller River was in high flood and only took two hours to overtop a dam formed by a massive slip in the Upper Buller Gorge. Little damage was done when water finally broke through the dam, although some machinery was washed away at the Coal Creek culvert in the Lower Buller Gorge, and the Bailey Bridge at Ohika was submerged (G.E.S. 04/10/1971). Although no flow recordings were made, the Buller River was high enough to flow down the Orowaiti overflow and some minor flooding occurred on the right bank downstream of Organs Island (W.C.B. File 375). Extensive surface flooding occurred near Reefton on the Maruia side and in the Buller County and Westport Borough some streets were difficult to negotiate. Part of the Upper Buller Gorge road was washed away near Dublin Terrace.

At its peak the Grey River was flowing at 3.5m/s (G.E.S 04/10/1971) and at 4.4m above normal and 2690 cumecs (W.C.B. File 375). Some surface flooding occurred in Greymouth but little damage was reported. Damage to river protection works was reported from the Buller, Inangahua, Kaniere and Wanganui Rivers although this was generally light (W.C.B. File 375).

10 - 11 MARCH 1972

After a period of drought, moderately heavy rain fell in Westland. In twenty- four hours to 9.00a.m. on the 10th Karoro received 92mm of rain, Franz Josef 114mm, Haast 95mm, Hokitika 76mm and Otira 38mm (11/03/1972). Moderate flooding occurred in South Westland rivers, particularly the Poerua and Wanganui Rivers. Levels in the Grey River and rivers further north were not very high. Minor damage occurred to river protection works on the Poerua River and at Three and Four Mile Creeks (W.C.B. File 375).

8 OCTOBER 1972

The Grey River peaked at 4,083 cumecs (W.C.B. data) and 5.8m after 325mm of rain in three days was recorded at Karoro. Flooding closed State Highway 7 between Stillwater and Coal Creek and two large slips closed the road at Upper Totara Valley and Omoto. Surface flooding occurred at Greymouth and Hokitika's water supply was cut from Lake Kaniere. Whitebaiters nets and some huts were washed down the Hokitika River (G.E.S. 09/10/1972).

High river levels were also recorded in the Buller, Maruia and Inangahua Rivers. Damage to river protection works was reported from the Grey, Maruia, Inangahua, Hokitika and Poerua Rivers and Doughboy Creek (W.C.B. File 375).

6 NOVEMBER 1973

Heavy rain in South Westland caused surface flooding on some roads but none were closed. Surface flooding occurred around Harihari and on the road between the Waitangi River and Lake Wahapo. There was 78mm of rain at Fox Glacier in twenty-four hours to 9.00a.m. on the 6th (G.E.S. 07/11/1973).

21 - 22 NOVEMBER 1973

Heavy rain over much of the West Coast caused moderate flooding in most rivers. In twenty-four hours to 9.00a.m. on the 21st Greymouth received 57mm of rain (G.E.S. 21/11/1973). The Grey River rose 5m above normal (G.E.S. 22/11/1973) and flowed at 980 cumecs at Dobson (W.C.B. data).

Many roads and bridges in the Grey County were damaged. The access road to the new Cobden Bridge was completely washed out (G.E.S. 22/11/1973), a small bridge on the Greenstone Road was washed out, and floodwaters blocked the Arnold Valley Road and the Bell Hill/Kopara Road. Atarau Road was closed to light traffic because of scouring at the Slatey Creek bridge and State Highway 7 between Reefton and Greymouth was closed because the approaches to Callaghans Creek bridge were washed out. Rough River flooded the road and a number of stock were lost in the Ikamatua area. One farmer lost 150 stock (G.E.S.21/11/1973). Karamea suffered its worst flood in 40 years as floodwaters entered about 60 houses and other buildings (G.E.S. 22/11/1973). At Market Cross water was 230mm above floor level in Liedmans Garage and 350mm above floor level in the old Post Office. At the Lands and Survey bench mark in the centre of the main Karamea intersection (State Highway 6 and Wharf Road) water covered the road to a depth of 610mm (W.C.B. Level Book W18). The whole Karamea Valley floor was covered by floodwaters which were heavily silted. Silting covered most pastures and deposits affected drainage, particularly in the Arapito area. The Karamea River flooded at around 3,680 cumecs and was considered a one in a hundred year flood (W.C.B. File 375). Seddonville and Waimarie were also flooded, and floodwaters blocked the road at Mokihinui (G.E.S. 22/11/1973). Numerous river protection works were damaged especially in the Karamea area (W.C.B. File 375).

#### 14 MARCH 1974

The Grey River rose slightly to low flood levels, peaking at 3,730 cumecs. (W.C.B. data). No damage was reported in North Westland or Buller as heavy rain was confined to South Westland. Minor damage occurred there; a culvert on the Paringa River was washed out and some scouring occurred at Doughboy Creek. Water was waist deep in the Jacobs Creek church (G.E.S. 15/03/1974).

#### 4 - 5 APRIL 1974

After two days of heavy rain the Grey River rose 2.5m at Dobson. Work on the new Cobden bridge was hindered as some equipment was lost and the causeway damaged. A pile was also washed away from under a Bailey Bridge on the site.

Heavy surface flooding occurred in Greymouth and Hokitika and one Cobden school had to be closed for the day because of the water. A creek swelled and flowed through a house at Karoro and streets in Hokitika's business district were closed because of surface water. The road at Totara River near Ross was also closed. No serious damage was reported (G.E.S. 05/04/1974). Moderate damage occurred to protection works on the Arahura and Taramakau Rivers (W.C.B. File 375).

#### 14 - 15 APRIL 1974

A torrential but short-lived downpour hit most of Westland and Buller causing serious flooding and slipping over much of the area. Reefton was worst affected with water entering houses and shops and vast amounts of silt were deposited. The Perseverance Bridge lost a 24m section and Reefton's water, power and telephone lines were damaged.

Eight washouts occurred on the Greymouth/Christchurch railway between Dobson and Stillwater, and trains to and from the Rewanui Mine were halted as a culvert under the line was washed out. The Grey River peaked 4.7m above normal but most damage to river protection works occurred in the Taramakau Valley where strong-heads and groyne were damaged lightly.

Greymouth streets had to be hosed down to remove silt left by the wash-back of the flooded river, and Range Creek in Cobden was one of the worst affected areas in the Grey Borough as it flooded properties and scoured footpaths. In Runanga water flowed through two houses and through Dunollie Hotel. Slips were widespread and three people died as they were caught in a mud-slide near the Lewis Pass (G.E.S. 16/04/1974).

#### 24 - 30 JUNE 1974

A violent electrical storm cut telephones and television transmitters over much of the Coast (G.E.S. 24-30/06/1974). Moderate flood damage was reported from the Mt. Diedrichs Farm Settlement where outfalls were damaged (W.C.B. File 375).

#### 19 - 24 JULY 1974

Another bout of electrical storm activity again cut telecommunication links and rail and power services. In the Upper Buller Gorge traffic was reduced to one lane as a massive slip covered the road at Wales Creek, and at Stillwater two power poles were washed out (G.E.S. 22-24/07/1974). More flood damage was done to the outfalls at Mt. Diedrichs Farm Settlement resulting in the need to replace 150 cubic metres of rock (W.C.B. File 375).

#### 8 - 9 OCTOBER 1974

Greymouth received over 100mm of rain in twenty-four hours to 9.00a.m. on the 9th, with the Grey River peaking at 3.9m at Dobson. Low lying areas of Leonard and Williams Street were flooded but no damage was reported. (G.E.S. 09/10/1974). Some river protection works in the Grey County were lightly- moderately damaged (W.C.B. File 375).

#### 14 - 15 NOVEMBER 1974

The Grey River rose 3.8m above normal just after 8.00a.m. as moderate rainfall fell throughout the night. Greymouth received 69.0mm of rain in twenty-four hours to 9.00a.m. on the 15th. The Westland Catchment Board advised farmers to move stock from low land as it expected over 100mm of rain in twenty-four hours (G.E.S. 15/11/1974), but this did not eventuate.

#### 24 FEBRUARY 1975

Access to the Fox Glacier was cut when a bridge over Hendes Creek was washed away. Heavy rain over two days caused slips to come down in the hills between Franz Josef and Fox Glacier during the night. At Chesterfield, south of Kumara Junction, a culvert was partially scoured out due to the weekends rain (G.E.S. 24/02/1975).

#### 29 - 31 MARCH 1975

Landslips and bridge breaks cut communications in numerous places after torrential mountain rain swelled creeks and rivers. Westport was the worst hit of the major areas, recording 80mm of rain and 80km/h winds during the twenty-four hours of Sunday 30th and Monday 31st. In the same period the Lower Buller Gorge received 130mm of rain and Greymouth 108mm from Saturday 29th to Monday 31st morning.

The Lower Buller Gorge road was covered by many slips which closed the Westport/Inangahua Road for thirty-six hours. Slips and washouts destroyed roadworks closing the Westport/Greymouth road, and damage was also reported from State Highway 7, between Reefton and Springs Junction, and the Westport/Kumara Highway. Several culverts washed debris onto the road and rail lines at Stillwater blocking access to Greymouth for the railcar. The Bailey Bridge at Mirror Creek was washed away and extensive slips in the Fox Hills reduced traffic to a single lane at Hendes Creek bridge and Oemoeroa. At Boulder Creek the water-

course diverted behind the Bailey bridge approaches and cut road links for a short period (G.E.S. 01/04/1975).

#### 2 APRIL 1975

The second instalment of the Easter storm was brought about by a north-westerly airstream associated with a very low depression moving across the bottom of the South Island. Torrential rain and gales up to 128 k.m.h. were recorded in Buller and Westland (G.E.S. 02/04/1975). The Grey River was in reasonably high flood, peaking at 4,075 cumecs, but did not flood Greymouth directly as the peak coincided with low tide (W.C.B. File 375). Surface flooding was the main concern in Greymouth as rain and blocked water-courses flooded low lying parts of the town.

At Stillwater 1m of water flooded the road, whilst at Mawheraiti 45cm of water covered the road. Floodwaters blocked the Westport/Greymouth highway as deep water ponded on the road at Wingham Park. Arthurs Pass and Otira Gorge were blocked by numerous slips and washouts, with the bridge approaches at Rocky Creek being washed away. The Lewis Pass was also closed because of deep floodwaters between Greymouth and Reefton and for the second consecutive day the Bailey Bridge at Mirror Creek was washed away (G.E.S. 02/04/1975).

#### 22 SEPTEMBER 1975

Greymouth Police and Army officers were called in to rescue a group of people stranded on the island just upstream of the Cobden bridge. The group were stranded by the sudden rising of the river after heavy overnight rain (G.E.S. 22/09/1975). Minor damage to protection works was recorded on the Grey River (W.C.B. File 375).

#### 14 JANUARY 1976

A torrential rainstorm in the North Island passed on to the South Island. As a result Greymouth recorded 65mm of rain in twenty-four hours to 9.00 a.m. on the 14th. Apart from some surface flooding in Greymouth virtually no damage was reported (G.E.S. 14/01/1976).

#### 26 - 27 JANUARY 1976

Heavy rain fell on the 26th and 27th over much of Buller/Westland. Greymouth recorded 90mm on the 26th. In Greymouth some streets in the commercial centre were surface flooded but no damage was reported. Farmland at Coal Creek was flooded as was part of the Runanga Highway. The Grey River rose 3.8m at Dobson. Small slips were reported from along the Coast Road and at Otira. The Buller River rose very quickly and washed away the causeway to the new bridge along with two caissons. This delayed construction for nearly three months (G.E.S. 27/01/1976). Moderate damage to river protection works was reported from the Wanganui River (W.C.B. File 375).

#### 10 MAY TO 19 MAY 1976

An early morning storm produced 70mm and 66mm of rain at the Greymouth Harbour and Karoro respectively, in twenty-four hours to 9.00a.m. on the 19th. Widespread surface flooding, power blackouts and some property damage occurred.

The worst hit areas were Leonard and Arney Streets which were partly closed by flooding, and Paroa Road. Water ran through the Greymouth Motel courtyard and entered a block of motel units, damaging carpets and other furnishings. In other parts of the motel mud had built up above floor level but had not entered the accommodation. The overflow built up at the Nelson Street/Paroa Road intersection heavily silting the footpath, and water ran through Sweetmans Grocery damaging some stock. Water was knee deep along Leonard and Arney Streets and

gardens near Victoria Park were completely covered with water although no houses were entered. Properties backing onto Sawyers Creek had their grounds flooded and at one point the creek was only 1m below the Marlborough Street Bridge (G.E.S. 19/05/1976).

### 3 JUNE 1976

Bad weather on the West Coast caused delays to road and rail services. The Christchurch to Greymouth railcar was delayed for an hour between Otira and Aickens because of flood waters on the line. The perishable goods train was held up four and a half hours at the same place. Arthurs Pass was closed because heavy rain on the Canterbury side made the ford at Greaney's Creek impassable and the Haast Pass was closed because of toppled trees (G.E.S. 03/06/1976).

### 4 JUNE 1976

Surface flooding occurred in Greymouth after a heavy bout of rain. In Leonard and Arney Streets traffic had to proceed cautiously and water ponded deeply around the Golden Eagle Hotel. The Greymouth Motel courtyard was filled with mud and water but the buildings were not entered.

The Grey River rose about 4.8m - the highest for several months but caused no problems as it rose slowly, thus giving farmers ample time to move stock (G.E.S. 04/06/1976). Minor-moderate river bank erosion was reported from the Grey Valley (W.C.B. File 375). The Taramakau River was also in high flood but no damage was reported (G.E.S. 04/06/1976).

### 9 JUNE 1976

An intense electrical storm produced almost 25mm of rain in less than twenty minutes on Greymouth. In all just over 50mm of rain fell in twenty-four hours to 9.00a.m. on the 9th. Mud and silt overflowed from blocked stormwater drains and entered two units of the Greymouth Motel ruining carpets and furnishings. Several streets were surface flooded but water receded quickly by late morning. Sawyers Creek rose rapidly but did not threaten property. The Grey River was running at 2m/s. Generally little damage was reported (G.E.S. 9/06/1976).

### 27 JUNE 1976

Over 50mm of rain fell during the night sending a minor fresh down the Grey River. This stopped work on the Stillwater bridge as a causeway was washed away. Ministry of Works staff had to wait until the river dropped before work could commence (G.E.S. 27/06/1976).

### 18 OCTOBER 1976

Surface flooding occurred in the Dobson, Taylorville and Marsden areas causing minor problems for road maintenance work. (G.E.S 21/10/1976). Rainfalls recorded on the 18th were 34mm at Karoro and 29mm at the Greymouth Harbour Board. (G.E.S 19/10/1976).

### 6 DECEMBER 1976

A fierce electrical storm over Greymouth produced 58mm of rain in twenty-four hours to 9.00a.m. at Karoro Station. Most rivers were in flood and the Grey River again washed out a section of causeway at the new Stillwater bridge. The river was running at 4.5 m/s. The runoff from Arnott's Hill subdivision caused problems as over 5cm of water flowed through one garage and wood and silt was deposited over many streets. One Byron Street resident claimed it was the worst flood damage to that date.



A slip on the Ten Mile Valley road occurred accompanied by some scouring and surface flooding. In general, damage was very light (G.E.S. 06/12/1976).

#### 9 DECEMBER 1976

The West Coast had its second heavy bout of rain in four days with 54mm being recorded at Karoro. Rivers were still running well above normal with the Grey running at 2m/s. Damage was again minimal being confined to isolated cases of surface flooding and scouring (G.E.S. 09/12/1976).

#### 27 - 28 DECEMBER 1976

In twenty-four hours to 9.00a.m. on the 28th Greymouth recorded 139mm of rain at Karoro. Surface flooding occurred over much of Greymouth and many streets were closed. The Greymouth gas supply was seriously threatened as water came within a few millimetres of flooding the furnaces. Minor slipping, overflowing of drains and damage to several streets occurred.

Sawyers Creek was running bank to bank and was only a few metres away from entering some properties. At 5.00a.m. (flood peak) it was lapping the decking of the Marlborough Street Bridge and was almost as high at Marsden Road. At one stage water was about 40cm deep and 3m across outside the Australasian Hotel. Just south of the Australasian Hotel, Two Mile Creek spilled across the main highway to join with runoff from the Arnott's Hill subdivision. This again flooded Milton Road-Byron Street and the Nelson Street-Milton Road intersection was badly scoured. The nearby motels were flooded to the greatest ever levels with some of the guests having to be evacuated. A section of footpath and road at Freyberg Terrace was also washed away. According to Mayor Jackson some places in Greymouth were flooded that never had been before.

Some of the worst flooding was along the Coal Creek flats where about 20cm of water entered a house when McLeans Creek overflowed its banks. The Greymouth- Runanga highway was blocked to all but heavy traffic by the flooding from McLeans Creek. At Omoto a slip restricted traffic to one lane. (G.E.S. 28/12/1976).

#### 18 - 19 JANUARY 1977

This was the worst flood in the Grey River since 1936 causing hundreds of thousands of dollars damage in the district. In twenty-four hours to 10.00a.m. on the 19th 150mm of rain was recorded in Greymouth. In Greymouth the river burst its banks opposite the Tainui Street/Mawhera Quay corner and by mid morning the water was only a few centimetres from the top of the wharf. At Dobson the river peaked at 6.4m (G.E.S. 19/01/1977) and flowed at 4,770 cumecs (W.C.B. data).

Water eventually poured over the wharf to a depth of about one metre for a length of 400m flooding much of Cobden, Blaketown and the Leonard, Arney Street area. These areas were flooded to a depth of more than 1.5m in places. Forty people had to be evacuated from the flooded area.

Most roads in the Grey County suffered from severe washouts and scouring. State Highway 7 at Stillwater and State Highway 6 at Coal Creek were washed out and closed, as were the bridges across Blackball and Slatey Creeks. The road between Greymouth and Runanga was closed because of floodwaters and the road from Greymouth to Westport was also washed out in two places. Several back roads were also damaged. The Midland Railway was blocked by a slip at

Kaimata, and the Stillwater/Westport railway was blocked by a washout between Ngahere and Ahaura and a slip between Tiroroa and Westport.

Although damage was widespread and costly to repair in Greymouth most reported cases were of minor nature and were repaired quickly (G.E.S. 19/01/1977). Damage to protection works occurred in many of the river systems of Buller and Westland and was of a moderate to heavy nature (W.C.B. File 375).

#### 28 JANUARY 1977

Two men had to be rescued by helicopter from the flooded Buller River about 1.6km downstream of the Gowan Bridge. They were in a party of four, attempting to go down the river in a 4m rubber dingy. (G.E.S 29/01/1977).

#### 2 FEBRUARY 1977

Torrential rain brought further flood threats to Greymouth leaving sheets of surface water in several streets. Roads were closed around the Leonard Street area as wash from vehicles was entering some properties. Sumps and drains were blocked because of the suddenness of the downpour. Water again entered the courtyard of the Greymouth Motels but no units were entered. The Grey River was well down but still managed to wash a span of the Blackball Bridge (collapsed previously) about 100m downstream.

A torrential downpour in the Taramakau Valley and Hohonu Ranges combined to wash away a portion of the road on the Kumara side of the Mitchells Hotel closing the road to all traffic (G.E.S. 02/02/1977).

#### 3 MAY 1977

Greymouth was flooded in parts by surface water after three days of heavy rain. Milton Road had up to 30cm of rock debris and wood across it, being washed down from the hills above. Some rocks were up to 30cm in diameter (G.E.S. 03/05/1977).

#### 29 JUNE 1977

Torrential rain fell at Westport during the morning, flooding many streets. No damage was reported but the rugby game between the West Coast/Buller team and the British Lions was disrupted. (G.E.S 29/06/1977).

#### 30 SEPTEMBER 1977

The Grey River rose after three days of heavy rain combined with snow melt. The river was photographed and studied by the Westland Catchment Board as part of its Greymouth Flood Protection study. No damage was reported anywhere (G.E.S. 30/09/1977).

#### 19 DECEMBER 1977

Heavy rain brought some surface flooding but little damage to Westland. Harihari received 64mm of rain in twenty-four hours to 9.00a.m. on the 19th which surface flooded the State Highway between Harihari and Hokitika. The worst patches were at Fergusons Bush and north of the Wanganui River.

Most rivers had a good fresh running but little damage to river protection works was reported (G.E.S. 20/12/1977).

18 - 20 JANUARY 1978

Rapid Creek in the Hokitika Gorge rose steadily during the night stranding a group of people on an island in the flooded creek who subsequently had to be rescued by helicopter. Flooding closed the State Highway 6 three kilometres north of Ross and a couple of minor slips hindered traffic between Hokitika and Haast. The Kokatahi District experienced medium river and surface flooding but no damage was reported (G.E.S. 19/01/1978). Surface flooding occurred in traditional areas of Greymouth such as Leonard and Arney Streets, after 110-114mm of rain fell in twenty-four hours to 9.00a.m. on the 20th (G.E.S. 20/01/1978).

13 -14 APRIL 1978

Between the evening of the 13th and midday of the 14th sustained periods of heavy rain occurred in Greymouth, Runanga, Karoro, Brunner and Stillwater. The rain was produced by a slow moving northerly frontal system moving south eastwards.

Smaller creeks flooded roads at culverts and larger creeks overflowed, flooding many houses. State Highways north and south of Greymouth were impassable due to slips and floodwaters, and rail links were blocked by numerous slips and washouts. Farmland at Coal Creek and McLeans Creek was inundated and Runanga was isolated from Greymouth. Damage was attributable to smaller water-courses as the Grey River did not rise above the levels expected in a minor fresh.

Sawyers Creek blocked by a large slip, overflowed its banks and flooded a wide area of lower Greymouth. Many streets in Runanga were flooded as Raleigh Creek overflowed its banks at various points. Many other creeks also caused problems throughout the area (W.C.B. File 377).

12 - 13 MAY 1978

Heavy rain caused minor flooding - mainly surface flooding over much of northern Westland. State Highway 6 was closed in three places by about 60cm of water covering the road at Lake Wahapo by river water running down the road on the south side of Franz Josef township and by water running over the road at Snapshot Creek. Minor slips occurred on road and rail links in the Otira Gorge/Arthurs Pass region (G.E.S. 12/05/1978).

Surface flooding in Greymouth was aggravated by the collapse of a water main, and ponding occurred near the Nelson Street/Main Highway intersection. Scouring was reported from Dunollie, but flooding in the Grey District was limited with no significant rises in river levels. Flooding near Lake Wahapo and slips near Fox provided the most trouble in Westland (G.E.S. 13/05/1978). Damage to river protection works was widespread but generally of minor scale (W.C.B. File 375).

13 JULY 1978

Greymouth received heavy overnight rain, with 56mm being recorded at Karoro and 59mm at the harbour in twenty-four hours to 9.00a.m. on the 13th. Surface flooding occurred in Leonard Street and several sumps were blocked around the town. Debris was washed down from the hills and spread across several roads (G.E.S. 13/07/1978).

10 AUGUST 1978

After heavy rain, runoff from the surrounding hills combined with water from over-loaded drains caused the worst surface flooding in Whataroa's history. However no serious damage was reported (G.E.S. 18/08/1978).

21 DECEMBER 1978

A few cases of surface flooding in low lying areas of Greymouth were reported following heavy overnight rain. No damage was reported (G.E.S. 21/12/1978).

6 - 7 MARCH 1979

South Westland suffered the worst in a heavy rainstorm which caused washouts, flooding and slips. Water on the highway near Totara River Bridge was about 1m deep and washouts occurred at several bridge approaches in the vicinity. A creek at Whataroa burst its banks and entered the hotel and garage. About 400m of stopbank on the Whataroa River washed out and further north the Kokatahi/Kaniere Road was flooded heavily (G.E.S. 07/03/1979).

Twenty four people had to be evacuated from Docherty's Creek as flood levels there and at Gibbs Creek were considered to be the worst in nearly 30 years. Stock losses were reported from the Totara Valley where a long term resident thought it to be the biggest flood in the valley for 15-16 years. Surface flooding occurred on the streets of central Hokitika and blocked the highway south of Hokitika (G.E.S. 08/03/1979).

6 - 7 MAY 1979

Northerlies and heavy rain for two days made the Grey and Buller Rivers rise to the highest levels since January 1977. The Buller was running 3.5m above normal (G.E.S. 07/05/1979) and the Grey was flowing at 3,870 cumecs (W.C.B. data).

State Highway 7 at Dobson and Stillwater, and the Lower Buller Gorge at Hawkes Crag were closed by flood waters as was the road from Greymouth to Punakaiki. Four bridge approaches in the Grey County were washed out. Two were in the Greenstone area, one between Rotomanu and Bell Hill and one between Inchbonnie and Rotomanu. State Highway 69 between Reefton and Inangahua Junction was closed by a washout at the road/rail bridge; the Arnold road bridge was also closed because of flooding. Slips closed State Highway 7 at Karamea Bluffs and State Highway 6 at Meybille Bay and Knights Point. Greymouth, Westport and Hokitika suffered from heavy surface flooding resulting in 20 houses having to be evacuated in Cobden and Greymouth (G.E.S. 07/05/1979).

1 OCTOBER 1979

A passing north-west front brought heavy rain to Westland. In twenty-four hours to 9.00a.m. on the 1st, Hokitika received 31mm of rain. In the same period Otira, Franz Josef and Fox Glacier recorded 175,182 and 187mm respectively. Minor slips throughout the region closed some highways for short periods and rivers were running high. No flood problems were reported and the region suffered very little damage as a result of the rain storm (G.E.S. 1/10/1979).

3 DECEMBER 1979

A violent storm hit much of the West Coast with heavy rain and north-west winds gusting up to 145k.m.h. Damage to most places was minimal except at Otira which suffered the worst of the storm, and at Franz Josef. During the night Otira recorded 254mm of rain. In the same period Greymouth recorded 56mm, Hokitika 54mm, Westport 29mm (G.E.S. 3-4/12/1979), Franz Josef 85mm and Fox Glacier 116mm. (Press 04/12/1979).

Significant damage occurred to the Otira Gorge Highway. There were major washouts, and the approaches to the Yorkys Point and Wallace Point Bridges were washed away; new gullies developed in the massive old landslide on which the Death's Corner and ZigZag sections of the highway are built; the bed of the Otira River was raised between 3m to 4m by aggradation; and

debris was deposited on the highway by rockfall. The highway was closed completely for a week and intermittently for about a month (Whitehouse and McSaveney 1989). The Lewis Pass Highway was also closed because of flooding at Stillwater, Mawheraiti and Rocky Creek, and the Haast Highway was closed due to numerous slips.

At Franz Josef, the Waiho River beached a 300m long gap in the right hand stopbank which protects the main highway and the Tourist Hotel (W.C.B. 1985). Flooding also occurred in all Canterbury Rivers and slips at Arthurs Pass blocked the highway, isolating the West Coast (The Press 04/12/1979).

At Dobson, the Grey River peaked at 5.8m and 3,960 cumecs (W.C.B. data). The Ahaura and Big Grey Rivers held their peaks of 7.3m and 1.5m respectively for six hours, and the Buller River rose 2.6m above normal causing extensive flooding at Inangahua Junction. Karamea was also badly flooded from the Karamea River; flooding also occurred at Inangahua Junction. The Taramakau River was at its highest level for at least a decade although it and other rivers caused very little damage (G.E.S. 04/12/1979). Other flood peaks recorded were: Hokitika at Kaniere State Highway bridge 6.3m; Hokitika at Collins Creek 6.5m; Kokatahi at the top bridge 2.4m; and Styx River at the lower bridge 2.9m. In Greymouth, the Grey River rose to within 10cm of the wharf (W.C.B. File 375).

Most damage was due to wind breaking power and telephone lines, and slips blocking the Otira road and the Buller Gorge rail line (G.E.S. 03/12/1979). Damage to river protection works was recorded from the Matakaitaki River to the Paringa River (W.C.B. File 375).

#### 24 - 25 DECEMBER 1979

Floods and slips cut the Haast Road after torrential rain fell between Ross and Harihari. In this area, 254mm of rain was recorded in twenty four hours to 9.00 a.m. on the 25th. The main flood problem areas were at Ebans and Bonar Creeks, 10km and 14km respectively from Harihari. At Ebans Creek floodwaters carried away about 20m of the bridge approach, and Lake Wahapo overflowed and flooded the road to a depth of over a metre. Powerlines throughout the West Coast were cut by the storm, resulting in the need for a portable generator having to be taken to Harihari to help farmers with their milking (The Press 26/12/1979). Perhaps the most serious damage to occur was the removal of the remaining 600m of the stopbank protecting the Tourist Hotel at Franz Josef by the Waiho River (W.C.B. 1985).

#### 19 - 20 JANUARY 1980

Heavy rain produced deep surface flooding in Greymouth. Streets were closed off in the town during the night of the 19th until water receded at daylight the next day (Jackson 28/01/1980).

#### 24 JANUARY 1980

Strong north-east winds accompanied by torrential rain brought the rivers of the Grey Catchment into high flood. The Grey River at Dobson was running at 5.7m (G.E.S. 25/01/1980) and 4000 cumecs (W.C.B. data). The Ahaura and Big Grey Rivers were running very high after twenty four hours of heavy rain.

The Grey River rose to 38cm above the wharf level, but serious damage in Greymouth was avoided by the construction of a 400m long sandbag wall on Mawhera Quay. Cobden and Blaketown suffered most with water being about one metre deep in some homes, and several houses had to be evacuated (G.E.S. 25/01/1980).

Up the Grey Valley, the flood was approximately the same as the 1977 flood. At 11.00 p.m. the Ahaura River peaked at 6.7m and the Big Grey River peaked at 2.6m (Jackson 1980). Stopbanks were broken and much silting of farm land occurred. One farmer between Ngahere and Stillwater suffered heavy stock losses and another had expensive property damage. Several county roads were flooded and damaged especially around Ahaura, Waipuna and the Clark River districts (G.E.S. 28/01/1980).

#### 27 JANUARY 1980

More heavy rain in the back country again brought the Ahaura River into high flood - the river rose 6.7m above normal. No damage was reported on this occasion (Jackson 28/10/1980).

#### 22 - 23 JANUARY 1982

Heavy rain centred in the Otira region (104mm in twenty-four hours) brought most Westland rivers into flood. The Grey River peaked at 5.7m (G.E.S. 23/01/1982) and flowed at 3,920 cumecs (W.C.B. data). Muddy water flowed through the western end of Greymouth as water broke through Richmond Quay, and Nimmo Park was inundated by the flood waters. At its peak the river was only 45cm from the top of the wharf. Much surface flooding occurred in the central business district as water backed up through the drains (G.E.S. 23/01/1982). Heavy surface flooding also affected Runanga and several houses and a shop were entered (G.E.S. 25/01/1982).

Other rivers in Westland were also in flood. The Taramakau, Hokitika and Arahura rose considerably. The Arahura broke its southern bank, cut off the main highway and flowed through the Greyhound Hotel (G.E.S. 23/01/1982). A big flood was reported in the Karamea River and much damage to river protection works occurred on the Wanganui River (G.E.S. 25/01/1982).

A flash flood occurred at Otira - within fifteen minutes Goat Creek spilled across the road and rail lines. The Otira highway was closed due to water flooding the railway underpass and water entered the hotel and threatened many houses (G.E.S. 22/01/1982). A slip also closed the gorge road - a detour was made around this but was washed out stranding many people. Electricity to Otira was cut sporadically and bad scouring of the railway embankment occurred (G.E.S. 25/01/1982).

#### 26 - 27 JANUARY 1982

Otira was again the centre of a heavy rain storm and was flooded for the second time in four days. Otira recorded 252mm of rain in twenty-four hours to 9.00a.m. (27th), which was 12mm more than the previous flood. A creek burst its banks and flooded the Otira highway and surface flooding again hit the town.

Most Westland rivers were in flood. The Ahaura reached 5.7m by midnight, dropped then rose again to 5.1m by 9.00a.m. on the 27th. The Big Grey at Ikamatua dropped to 1m about 9.00a.m. on the 26th but had risen to 1.8m during the night (G.E.S. 27/01/1982). The Grey River rose to within 70cm from the wharf - causing surface flooding in Leonard Street, Arney Street, Preston Road etc. Moderate damage occurred to the Grey River protection works. The railway to Runanga was washed out at Coal Creek and surface flooding occurred on the road to Taylorville.

Intense rain in South Westland also caused trouble. In a twenty-four period Franz Josef recorded 330mm and Fox Glacier 288mm. State Highway 6 was closed because of numerous

slips between Haast and the Glaciers (G.E.S. 27/01/1982) and bad damage was inflicted on the Waiho River scheme being constructed at the time (G.E.S. 28/01/1982). Elsewhere a slip closed State Highway 73 near Deception Point and surface flooding occurred on the highway near Maruia Springs (G.E.S. 27/01/1982).

#### 10 - 12 MARCH 1982

Intense rain caused severe flooding in South Westland rivers, in places being estimated as greater than the one in a hundred year flood. Official rainfall recordings between 5.00p.m. on the 11th and 6.00a.m. on the 12th showed Franz Josef as received 350mm of rain (G.E.S. 12/03/1982). However, rain gauges in the Franz Josef area overflowed, and it was calculated that 1820mm (six feet) of rain fell between the 10th and 12th (G.E.S. 24/03/1982).

Damage was severe and widespread. Over half of the 10 year old Waitangi-toana River Bridge was destroyed as the river burst its banks and washed away three spans and a pier. The flood peak in the Waitangi-toana was estimated at about 700 cumecs with a mean velocity of 4 m/s. This being in the order of a 50 year return period flood (M.W.D. 1982). Numerous other bridges were also swept away. Telephone and power links were cut south of Harihari and the Franz Josef community was completely isolated.

The Waiho River scheme being constructed at the time was devastated, as the river throughout the length of the scheme burst its banks (G.E.S. 12/03/1982). A 500m stretch of the Waiho scheme was completely destroyed adjacent to the Waiho Flats road. This made the river change course, spreading much silt over farmland and killing thousands of lambs and ewes (G.E.S. 15/03/1982). The Waiho River bed below the glacial moraine aggraded 3m, and about 800 hectares of farmland between Docherty's Creek and the Waiho River were flooded. In this area county roads, buildings, fences and pastures were either badly damaged or destroyed (G.E.S. 24/12/1982). Flood damage in South Westland exceeded \$2,000,000 (G.E.S. 17/02/1982), with \$700,000 being needed to repair river works in the Waiho, Whataroa, Cook and Jacobs Rivers, and Docherty's Creek (G.E.S. 24/03/1982).

#### 2 DECEMBER 1982

An electrical storm centred on Greymouth with 84mm of rain being recorded at the harbour in twenty four hours to 9.00am. Other rainfall recordings during the same period were: Blackball 23mm, Otira 44mm, Punakaiki 3mm, Hokitika 3mm.

Greymouth suffered badly from surface flooding, slips and scouring (G.E.S. 21/12/1982). The most severe damage was in Freyberg Terrace where runoff from the hill scoured an embankment and damaged the stormwater drain. Street seal was scoured in several places and silt had accumulated in the sewer lines (G.E.S. 22/12/1982).

Elsewhere, surface flooding was severe in the central business district around Albert, Arney, Leonard and Guinness Streets. A slip on the Cobden Hill blocked State Highway 6, and State Highway 7 and the rail line at Omoto were blocked by surface flooding and slips. Power between Camerons and the Upper Grey Valley was cut for a short period due to a lightning strike at the Dobson Power Station (G.E.S. 21/12/1982)

#### 10 JULY 1983

The Greymouth area recorded 205mm of rain in forty-eight hours of the 9th and 10th. The Grey River rose 5.7m at Dobson (G.E.S. 11/07/1983) and peaked at 4,180 cumecs (W.C.B. data). The river was level with the top of the wharf and remained high for a long time. Water entered

houses in Cobden and Blaketown resulting in a few people having to be evacuated from Blaketown. Surface flooding was the major concern in Greymouth but State Highway 7 at Stillwater was cut from floodwaters of the Grey River and Nelson Creek. The Mawheraiti Bridge was closed as the Mawheraiti River was close to flowing over the bridge and the Kumara Power Station was closed down for the weekend as water surrounded it (G.E.S. 11/07/1983).

#### 17 - 18 OCTOBER 1984

Unsettled weather combining high winds and heavy rain raised many West Coast river levels. In twelve hours to 9.00a.m. on the 18th Greymouth received 60mm of rain (G.E.S. 18/10/1984). The Grey River at Dobson peaked at 3,720 cumecs (W.C.B. data) and was about 1m below the wharf. Reported damage was minimal. In Greymouth surface flooding occurred in traditional areas such as Leonard and Albert Streets due to overflow of the stormwater and sewage pipes. Streets in central Greymouth were closed to traffic for the day and in the county widespread surface flooding, minor slips and washouts occurred.

In the Buller County a section of the Little Wanganui subdivision was destroyed and had to be rebuilt after surging waters scoured the metalled road surface. A section of Nine Mile Road 15km south of Westport was washed away over night cutting a trench 3-4m wide and 2-3m deep. In other areas a culvert on State Highway 73 west of Jacksons was blocked by floodwaters and a slip covered the road. At Haast an approach to the Turnbull Bridge was washed away and flood waters reached the front door of the Greyhound Tavern at Arahura (G.E.S. 18/10/1984).

#### 23 NOVEMBER 1984

Greymouth was hard hit by a flood brought about by strong north-west winds and heavy rain. The Grey River at Dobson peaked at 6.5m (G.E.S. 24/11/1984) and 4,750 cumecs (W.C.B. data). Sand bagging along the entire length of Mawhera Quay prevented the main body of water from entering the business district although more than half of the Greymouth stores were flooded up to a depth to 1.5 metres.

Water entered the orchestra pit at the Regent Theatre and was about 45cm deep in the Theatre Coffee Shop, 30cm deep in the Golden Eagle Hotel and 23cm deep in the Duke of Edinburgh Hotel. Cobden and Blaketown were severely hit resulting in about 30 people having to be evacuated by boat. Many claimed this was the worst Greymouth flood ever, even surpassing the January 1980 flood (G.E.S. 24/11/1989).

#### 20 DECEMBER 1984

Besides widespread surface flooding very little damage was reported after a night of heavy rain in North Westland. In the twenty-four hours to 9.00a.m. on the 20th Greymouth recorded 70mm of rain and Hokitika 89mm. Surface flooding affected the Camp Overbridge between Runanga and Greymouth and slips closed the road between Kumara and Jacksons at Rocky Point (G.E.S. 20/12/1984). State Highway 7 at the Big Grey River was closed due to flooding and in Greymouth, Albert and Arney Streets were affected by surface flooding (G.E.S. 21/12/1984). The Grey River at its peak was flowing at 3,710 cumecs (W.C.B. data).

In South Westland, serious damage occurred to the right stopbank on the Waiho River. About 400m of the bank was washed out in the vicinity of the airfield; the repair works were estimated at \$133000. The failure of the bank was attributed to the river waters scouring the left bank at the rubbish tip site and rebounding off onto the right bank downstream of the State Highway



Bridge. Based on a forty eight hour rainfall of 483mm, this was considered a 20 year event (W.C.B. 1985).

#### 19 MAY 1987

Overnight, the Buller Region received 35mm of rain, Greymouth 69mm, Hokitika 56mm, Otira 43mm, Fox Glacier 24mm and Haast 15mm. No flood damage was reported as most river levels were relatively normal. However, Sawyers Creek was in fresh, indicating the rain was mainly coastal (G.E.S. 19/05/1987).

#### 13 - 15 JUNE 1987

Heavy rain caused by two cold fronts moving up the coast affected much of Westland; little damage was caused, being confined mainly to the south. Franz Josef recorded 238mm in forty-eight hours between the 13th and 15th. Little Man Creek burst its banks and blocked State Highway 6 and scoured a county road. At Havelock Creek between Fox Glacier and Karangarua, flooding closed the highway, and the rain turned other South Westland creeks and rivers into muddied torrents, although damage was minimal.

Hokitika recorded 114mm of rain and Greymouth 161mm in the same forty-eight hour period. The Grey was running a light flood and waters did not reach alarm levels (G.E.S. 15/06/1987).

#### 6 OCTOBER 1987

Parts of South Westland were flooded by torrential rain, noticeably the Glacier area. Franz Josef recorded 235mm in the twenty-four hours to 9.00a.m. In the same period Fox Glacier received 192mm, Pukekura 51mm and Hokitika only 3mm.

The heavy rain disrupted the water supply at Franz Josef when the supply was washed out, but it was quickly repaired. Floodwaters also scoured out part of the northern approach to the Whakapohai River. No other damage was reported (The Press 07/10/1987).

#### 19 - 20 MAY 1988

Heavy rain fell between 8-19 May, following the driest April on record, raising the Grey River at Dobson to 5.4m above its normal 1m level (Fauth 1988a). At its peak the river was flowing at 5180 cumecs (W.C.B. data) and at 7m/s. These were the highest levels ever recorded. Water levels in the Grey were elevated by the Big Grey running at 2.7m and the Ahaura at 7.6m.

Water rose to within a metre of the 2.3m high Cobden stopbank for much of its length, although at the Range Creek Lagoon it was only 15cm from the top. Most of Greymouth was flooded and a Civil Defence emergency was declared at the peak of the tide at 1.00a.m. Water began to enter the town as the river overflowed the banks near the signal box. At the height of the flood between 2.00a.m. and 3.00a.m. water surged through Mackay and Guinness Streets and Mawhera Quay, lifting man-hole covers and exposing high voltage wires, and uplifting and twisting asphalt and rail lines. Water was over 1m deep in many places making it impossible to cross places like Albert Street. Over 1m of water flowed through the Union Hotel, along with deep mud and silt for the first time. Other hotels also suffered badly. The Gilmer Hotel had almost half a metre of water and silt pass through it whilst the West Coast Lodge received about 45cm of the same. Also at the Lodge, the force of the water uplifted a large beer cooler containing 1,200 litres of beer and shifted it across the backyard. Over 1m of water flowed through the Golden Eagle Hotel and over 75cm passed through the Duke of Edinburgh Hotel. Further up the Quay, the Railway Hotel only received a few centimetres of water and the Royal Hotel completely escaped the flooding. Water levels were up to the windows of the Greymouth

Library and the Aerodrome was under about 1m of water in many parts. Severe surface flooding occurred in low lying areas of Cobden and water entered businesses of Greymouth that had been raised to the Borough Council's flood specifications based on prior floods (G.E.S. 20/05/1988).

All rivers from the Karamea to the Wanganui rose to major flood levels, as already saturated catchments shed the excess water. Three Buller River tributaries recorded "one in 50 year floods" and the Inangahua River rose to a level greater than any on record. Personal observations indicated it was the largest flood known (Fauth 1988b). However, most damage occurred in the Grey Valley. The road at Coal Creek was totally cut off as it was between Stillwater and the Arnold River due to flood water. Heavy scouring cut the Lower and Upper Buller Gorge roads, State Highway 7 between Greymouth and Reefton and State Highway 73 at Rocky Creek between Jacksons and Aickens. The temporary bridge at Craigieburn Creek and its approaches were washed out as was the Granite Creek Bridge. Caledonian Creek overflowed and blocked the road in that area. The rail line between Greymouth and Christchurch was washed out, being blocked at Ngahere and Totara Flat, and the Westport Greymouth line was blocked by three slips and a bridge washout between Ngakawau and Westport.

At Omoto, racehorses were saved but about 30 sheep drowned and bulldozers were needed to secure timber packs for the new grandstand from floating away. All of Omoto was flooded but water drained away quickly when the river levels dropped (G.E.S. 20/05/1988). Further up the valley farms suffered particularly heavy losses, as many stock were washed away, fences were destroyed and heavy silting of pasture occurred over a wide area. (Fauth 1988, Civil Defence Report 1988). Much destruction was done to river protection works throughout the region, especially the Grey Valley and was estimated to cost \$1,352,250 to repair (Fauth 1988a).

In all, about 400 people from 102 houses had to be evacuated (Civil Defence Report 1988a) and total loss of property in insured and uninsured terms was estimated to be about \$4,000,000 (Works Department 1988).

#### 25 JULY 1988

Torrential rain over the weekend caused surface flooding in Greymouth and closed State Highways 6 and 73. Since the 22nd, 131mm of rain fell in Greymouth. Surface flooding occurred in Palmerston, Shakespeare and Marlborough Streets and deep surface flooding occurred at the corner of Frickleton and Alexander Streets. Flooding was caused by the overloading of drains on the 25th.

Between Greymouth and Westport, State Highway 6 was closed when a bridge approach was washed out at Lawsons Creek 5km south of Punakaiki. A rock slip also closed the Otira Gorge. Flood damage in the area was generally light (G.E.S 25/07/1988).

#### 23 AUGUST 1988

Surface flooding occurred in Westland as a result of heavy rain in the mountains. Flooding of the highway occurred between Greymouth and Runanga and between Kumara and Jacksons. The approaches to the Greenstone Creek bridge at Cape Terrace were washed out and the surface at Mawhera Quay level crossing was broken by heavy rain (The Press 24/08/1988).

#### 13 SEPTEMBER 1988

Steady rain fell between Saturday the 10th and Tuesday the 13th, thoroughly wetting already saturated catchments in Buller and Westland. Rivers in the Buller and Grey catchments were

most affected. Total rainfall in the Grey Catchment during this period was 291mm in the Upper Grey and 169mm in Greymouth. The Haupiri/Rotomanu area received the greatest intensity of rainfall, recording 150mm from 9.00a.m. Monday the 12th to 9.00a.m. Tuesday the 13th.

At Dobson the Grey River peaked at 5.8m above its normal 1m flow level (Fauth 1988b) and at 5,770 cumecs (W.C.B. data). This was 0.4m and 590 cumecs greater than the May 1988 flood - the previous biggest flood in Greymouth and the Grey Valley. Thus, the worst flooding in Greymouth's history occurred and the flow was considered to be 121+ years in magnitude. The Buller River at Westport peaked at approximately 6,100 cumecs, equating to just under a ten year return period. The Buller overflowed into the Orowaiti between 9.00a.m. on Tuesday until early Wednesday morning. Other rivers rose rapidly. The Matakītiki rose 40mm in 15 minutes and the Maruia rose 4.6m in 2.5 hours. The Hokitika and Karamea Rivers also rose rapidly but caused little concern (Fauth 1988b).

Damage was widespread and severe. Much of Greymouth was inundated resulting in 183 homes and 356 people having to be evacuated (Kerr 1988). Many goods and supplies were damaged in shops and heavy silting occurred through much of the town. Many houses were flooded even before the river came over the wharf. The rising river flowed into Erua Moana Lagoon and into Lake Karoro. Sawyers Creek, swollen from the rain also flowed into Lake Karoro. By early morning both the lake and lagoon broke free, flowed through Victoria Park and flooded Arney, Boundary and Swainson Streets with more than 1.6m of water. The rising floodwaters threatened the business district from behind and backed up along Preston Road. The lake behind Preston Road eventually overflowed, and silt laden water flowed through houses in the area. The river then came over the wharf at about 9.00a.m. on the 13th and flooded the town from the river side. At the peak of the flood approximately 2m of water flowed through the business district in many parts (The Press 21/09/1988).

Approximately 50 farms were affected by the flood (G.E.S. 16/09/1988). Many of these suffered from silting, stock losses and fence and stopbank damage. Stock losses in the Upper Grey Valley were relatively light due to ample flood warning. However, in other areas stock losses were severe. The Crooked River/Rotomanu area - a traditional stock refuge was overwhelmed with water and stock losses were very high (Kerr 1988). River protection works were either further damaged from the May 1988 flood, or repairs carried out after the May flood were destroyed, or damage not connected with the May flood resulted. Estimated of damage to protection works were put at \$1,196,500 (Fauth 1988b).

In general, damage to communication links was light. Numerous slips, scours, minor damage to bridge approaches and overtopped culverts were the main problems for the Westland County and were quickly repaired in most cases (G.E.S. 17/09/1988). Worst affected areas were State Highway 7 at Stillwater and Runanga, Wahapo, the Upper Buller Gorge between Inangahua Junction and the township, and the Kaniere/Kokatahi Road which were all closed due to flooding. Slips closed the Otira Gorge (Christchurch Star 13/09/1988) and a slip at the Rewanui State mine buried a hut, killing one person. A large slip about 300m east of Cobden closed State Highway 7 as it completely blocked the road (G.E.S. 17/09/1988).

The intakes of the Greymouth and Runanga water supplies were threatened with damage as the Coal Creek stopbank which protected them was demolished (Kerr 1988), and Kumara lost its alternative water supply when the Taramakau River cut into the bore site and washed away the well casing (G.E.S. 17/09/1988). Total repair bill for the flood, including physical damage and

lost profits etc. has been estimated at approximately \$40-\$45 million, by Mayor Dallas of Greymouth (New Zealand Herald 15/04/1989).

#### 18 SEPTEMBER 1988

Continued rain brought surface flooding to many parts of Greymouth as drains were still blocked from the big flood on the 13th, and pumps were having trouble moving the water (The Press 19/09/1988).

#### 4 - 5 OCTOBER 1988

Heavy rain over much of the West Coast caused many rivers to rise. Franz Josef received the heaviest rainfall of 146mm during the night. Falls of over 100mm were recorded from the Westland and Buller Ranges and between 35mm and 50mm along the coastal area north of Ross. The rainfall was attributable to a moist north-westerly flow.

The tributaries of the Grey River rose to similar levels of the May 1988 flood. However the Grey was low at the time and was able to carry the extra volume. The Grey at Dobson peaked at 5.6m above normal. Low lying farmland at Kaiata, Coal Creek and Stillwater was flooded. At Kaimata a helicopter had to be used to rescue 75 heifers trapped by flood waters.

In Greymouth surface flooding occurred in traditional areas such as Boundary Street, and Nimmo Park playing fields were flooded by the Grey River (G.E.S. 06/10/1988). The Taramakau was also in reasonable flood although damage was not reported. A slip closed the Greenstone/Mitchells road for a short period and a slip across the Waipuna Road occurred but the road remained open.

Further afield, low lying farmland was also flooded from the Lower Inangahua, Buller and Karamea Rivers. Flooding and a slip near Inangahua Junction closed roads in that area and a slip near Lyell bridge blocked State Highway 6 for three hours. Parts of State Highway 69 near the Junction were impassable because of the flooding. A small slip on the Coast Road between Punakaiki and Westport reduced traffic to one lane.

The Karamea River looked most dangerous as it rose 30cm per hour, peaking at 4.6m at the Karamea bend, 40km upstream from the township. The Umere Overflow near the township broke its banks and spilled onto the main road near Market Cross. Water also over-topped the stopbank at Arapito about 3km upstream from the town and covered farmland. Karamea School closed for the day because of the high river levels. The Mokihinui River was also up but did not flood farmland. The Buller River at Berlins peaked at 11.4m (G.E.S. 05/10/1988).

#### 17 - 18 OCTOBER 1988

A whitebaiter drowned in the swollen Paringa River and most other rivers in Westland were in a state of fresh after 25 days of consecutive rain. The Grey River was 1.2m above normal (G.E.S. 18/10/1988).

#### 23 NOVEMBER 1988

Heavy rain in the Buller and Nelson ranges caused no problems for the West Coast. To the south falls of 45mm and 50mm were reported from the glaciers in a twenty-four period and up to 100mm in the South Westland ranges. Only minor surface flooding occurred in Greymouth (G.E.S. 24/11/1988).

#### 7 DECEMBER 1988

Heavy rain in the Grey catchment caused creeks to flood resulting in surface flooding in some areas. State Highway 6 between Greymouth and Runanga was covered with about 300mm of water as Coal Creek flooded. Surface flooding was also reported in the Kamaka, Blackball, Haupiri, Rotomanu areas and Harihari.

The Iveagh Bay road was closed when the Crooked River became flooded, and the flooded Kokatahi River cut into the south bank by Lake Arthur. The Taramakau and other South Westland rivers were also in flood. The heavy rain was mainly confined to the Paparoa Ranges where 240mm fell in twenty-four hours until midnight on the 6th. About 50mm fell in the central Grey catchment in the same period (G.E.S. 08/12/1988).

#### 13 DECEMBER 1988

Heavy rain in the Hokitika catchment caused minor freshes in creeks and streams flowing into the Hokitika River. No damage was reported (G.E.S. 13/12/1988).

#### 23 - 24 MARCH 1989

Heavy overnight rain generated high flows in the Greenstone River which washed out the Greenstone bridge during the late night-early morning. Two American tourists nearly drowned while trying to cross the swollen Waiho River on the 24th (G.E.S. Star 28/03/1989). The Taramakau, Hokitika, Grey and Buller Rivers were running high and the Grey was reported to be only a metre from the top of the wharf (G.E.S. 25/03/1989). Lower river flats and Omoto area suffered minor flooding.

#### 28 - 29 MARCH 1989

A heavy rainfall event concentrating in South Westland caused minor surface flooding and slips throughout Westland. In a twenty-four hour period Fox Glacier received 122mm, Franz Josef 110mm, Greymouth 27mm (G.E.S. Star 29/03/1989) and Okarito 39.9mm (G.E.S. 26/04/1989). The Grey River was running between high and normal flow but no damage was reported.

Slips closed the road at Fox Hills between the Glaciers and cut telephone communications in the area. A washout at Depot Creek closed the road between Haast Pass and Haast and surface flooding covered parts of the Otira Gorge road (G.E.S. 29/03/1989).