

# The Bulletin Kaikōura earthquake update

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## COASTAL PACIFIC IS COMING BACK THIS SUMMER

The iconic Coastal Pacific scenic train will roll again between Picton and Christchurch from 1 December this year, two years after the service was put on hold because of the devastating Kaikōura earthquake. The service will operate for an extended summer season from 1 December 2018 until late April 2019.

KiwiRail is looking forward to seeing the well-loved service run again, and expects it to fill up fast, with many people keen to support the local community and see the dramatic changes to the coastline and the work done to restore the road and railway line through this area.

KiwiRail is also working closely with the local tourism industry to encourage visitors to the area and to stay awhile and enjoy all that Kaikōura has to offer.

As a tribute to those communities most directly affected by the earthquake, and the people who have worked so hard to restore the road and rail line, KiwiRail is offering a special 'locals' discount rate.

The Coastal Pacific will depart Christchurch at 7am every morning from 1 December with stops at Rangiora, Kaikōura and Blenheim. The train will leave Picton at 2.15pm to head back to Christchurch.



Sue McInnes

### Looking forward to the Coastal Pacific returning to Kaikōura

Kaikōura local Sue McInnes joined others who gathered outside the i-SITE last Thursday to check out a promotional event held with The Breeze to celebrate the announcement of the Coastal Pacific returning on 1 December.

Sue runs Guided Walks Kaikōura and used to work around the Coastal Pacific visits, meeting daytrippers for one-hour guided walks.

Sue says the town is very excited about the return of passenger trains.

'Tourism in Kaikōura is very seasonal, so it will be a great boost and we are looking forward to it starting back,' she says.

This Bulletin provides the latest information about the rebuild of road and rail networks damaged by the Kaikōura earthquake in November 2016. The Bulletin is produced by the North Canterbury Transport Infrastructure Recovery (NCTIR) - an alliance representing the NZ Transport Agency and KiwiRail, on behalf of Government. Please note the next edition of The Bulletin will be published on Monday, 27 August

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- Using sound and light to map the foreshore and seabeds



## SH1 DAYTIME CLOSURE

The NZ Transport Agency scheduled a three day, daytime closure from 6-8 August in order to stabilise a rock face at Ōhau Point.

Unfortunately weather conditions have meant the last part of this work, grouting the rock anchors into the cliff face, was unable to be finished in the road closure time. As a result, State Highway 1 between Clarence and Mangamaunu will be closed on Monday 13 August from 8am to 4pm.

During this time any people travelling between Picton and Christchurch will need to take the Lewis Pass/ Murchison route.

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The KiwiRail and NCTIR teams continue to make tremendous progress rebuilding the Main North Line to improve its reliability and resilience.

KiwiRail continues to run freight services at night to enable uninterrupted works to road and rail during the day but work trains are operating day and night. Take care at level crossings and expect trains, at any time from either direction.



## SOPHISTICATED TECHNOLOGY IS SPEEDING UP REPAIR OF STATE HIGHWAY 1

If you drive along the highway you may notice several innocuous looking survey stations along the way. However, these tools are anything but mundane.

Laser technology, much of it known as LiDAR or similar, is being used to project beams of light onto hard-to-reach places like rock faces to provide accurate measurements and images.

Earlier this week a section of State Highway 1 north of Kaikōura was closed while strengthening work was completed at Ōhau Point. With a survey station set up at the base, several sensors were placed on the rock stabilisation work with many of them in the vicinity of a huge boulder within the wall that needed to be worked on. Heavy steel rods were drilled into it and then grouted in place to anchor it to the face.

The survey station was used to monitor the rock face in real time and detect even the slightest movement – an important safety measure for workers suspended by ropes working on the rock.

Paul Horrey is geotechnical engineer working on Ōhau Point.

‘To have the data collected in real time rather than having to stop and measure things speeds things up,’ he said.

It also means they can access detailed 3D models of the rock face quickly and efficiently. ‘That gives us a really accurate and detailed understanding of how the face is behaving and any natural movements.’

NCTIR delivery survey manager Philip Orr said ‘The survey team get to work in an all-encompassing environment using cutting edge technology and recognise the work they are doing delivers a big part in keeping the construction teams safe and the project on track carving enduring connections.’

The detailed three dimensional maps and models of key sections of State Highway 1 which this technology helps to produce will become important sources of data for road engineers for decades to come.





# DESIGN ON THE OKIWI BAY SAFE STOPPING AREA IS GOING FULL STEAM AHEAD

Okiwi Bay is located 30 km north of Kaikōura and there will be one purpose built safe stopping area at the bay.

Derek Watson is NCTIR's project engineer for the safe stopping areas. He said the design would introduce some changes to how people access the bay while maintaining its low key character.

'The current car park to the north of the bay will be closed. The new amenities and access to the bay will be shifted south to a more suitable area, opposite the neighbouring Department of Conservation picnic and camping area. There will still be an access point to the northern headland and surrounding land and the slow vehicle bay is staying.'

The bay changed considerably after the 2016 earthquake. It was transformed into a larger sandy beach and it has become even more popular with locals and visitors in the summer months.

'The new car and bus park area will be softened by using landscaping and natural stormwater treatment areas which are planned to enhance the area by introducing more local planting. All work will be set back from the edge of the current vegetation line and will not encroach onto the beach itself. Simple timber or concrete tables and seating will enhance the aesthetics of the bay and provide a more sheltered and relaxing rest area.'

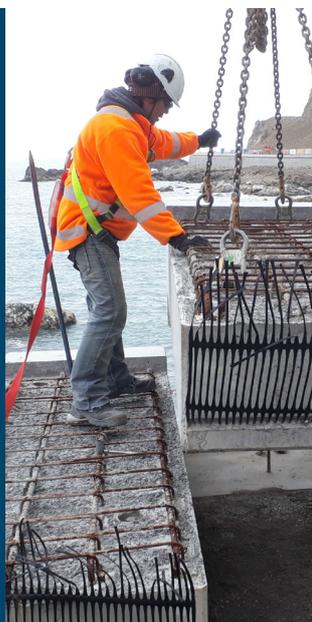
The headland look-out points have been identified as an opportunity for walkers and provision has been made in the design plans for signage to inform drivers of the safe stopping area ahead. Universal access principles for the disabled will be incorporated into the design where possible.



For more information and to see draft concept designs go to: [www.nzta.govt.nz/kaikoura-earthquake-response/safety](http://www.nzta.govt.nz/kaikoura-earthquake-response/safety).

Please continue to give us your feedback at [info@nctir.com](mailto:info@nctir.com), we're still working on them.

It was a monumental day for Dennis Temo recently. Dennis helped to lay the first seawall block at Site 7 north of Ōhau point. Twelve months later Dennis was photographed recently helping to lay the last capping block which was a significant milestone in the completion of the seawall. It was not only a landmark to be proud of for Dennis, but all the hardworking team at Site 7.



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Travel Period: 1-19 December 2018 and 1-27 April 2019

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## USING SOUND AND LIGHT TO MAP THE FORESHORE AND SEABEDS

After the Kaikōura earthquake we could see that land levels had changed significantly but any changes in seabed levels were more difficult to assess. Understanding these changes is important, not only for navigation, but also for the planning and design of coastal works.

As early as December 2016, surveying and engineering company Eliot Sinclair was engaged to carry out a survey in South Bay, to determine navigable depth for Whale Watch, and the extent of the tectonic uplift of the sea bed and surrounding peninsula. They've since completed coastal profiling all the way from the Raramai tunnels through to Waipapa Bay as part of the NCTIR project.

Processes for mapping the seabed and shoreline have changed over the years. Historically, crew used a lead line over the side of a ship to measure ocean depth. This wasn't reliable, as it only captured depth at one point in time – and if the ship moved, that measurement could be inaccurate.

Fortunately, technology has come a long way. To map the seabed around Kaikōura, local cray fishing boats are used with single beam or multibeam echo-sounding systems. Instruments attached to the boats bounce a sound wave off the bottom of the ocean floor to measure depth.

The foreshore itself can be mapped using a high-tech drone and photogrammetry or laser scanners which measure the profile and shape of the area and this helps to develop a 3D model.

However, there's a tricky bit between the foreshore (land) and the open sea, where it is impossible to access by walking or by boat due to shallow depths and waves. This is where old and new technology meets with the team adding a lead line to a drone which has a video feedback system to the pilot.

By flying the drone along a specific line, and dropping the lead weight at selected way points the pilot can get an accurate measure of sea bed depth.

Combining all the data from these different measurements with GPS technology helps to create a map which can be used to measure navigable depth for boats and also develop wave models to predict how waves will break on the coastline.



A KiwiRail team has placed railway track onto the third and final debris-flow rail bridge between Half Moon Bay and Ōhau Point, north of Kaikōura. A channel is now being dug under the bridge, which will allow material from the hillside above to pass underneath. After those earthworks are complete, the next step is concreting the channel.



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