

The Head of Lake Wakatipu area – consequences of a changing future landscape and climate

Geomorphic change – rivers, floodplains and deltas

Channel migration and floodplain erosion

Erosion continues westwards on the Dart floodplain, continuing the trend observed for at least the last 50+ years.

As is expected in braided river systems, erosion and channel migration is also expected at other sections of these floodplains.

Riverbed aggradation

Ongoing sediment deposition in the Dart and Rees rivers gradually raises riverbed levels.

Based on survey data from the lower section of rivers, this rise is at least 0.1m each decade, and may be as high as 0.2-0.4 per decade.

Continued rise of the Rees channel will eventually breaks its banks to form a new channel through the wetland and lagoon.

Delta growth

The delta shoreline will continue to grow into the lake at a rate of 2 or 3 metres every year.

Climate change

The climate will continue to change, with more frequent and heavier rainfalls.

This causes larger and more frequent flood events, and an increased rate of sediment transported through the river system.

Higher intensity rainfalls may also cause more likely rainfall-triggered events such as alluvial fan activity and debris flows.

This map illustrates the projected geomorphic consequences of climate change in the Head of Lake Wakatipu area. The map features a central river system (Dart and Rees rivers) flowing into a lake. The surrounding landscape is depicted with various shades of green and brown, representing different land types and vegetation. Key features include:

- Consequence: Floodbank performance, Flooding and Erosion:** Increased likelihood of flood events causing reduced performance levels for floodbank. Increased likelihood and higher magnitude flood events causing more likely impacts to roads and farmland.
- Consequence: Alluvial Fans:** Increased frequency of alluvial fan activity – more likely road disruptions to Routeburn, Kinloch and other roads.
- Consequence: Alluvial Fans:** Increased frequency of alluvial fan activity – more likely impacts to any buildings constructed on active fan surfaces – e.g. at Precipice Creek.
- Consequence: Flooding and Erosion:** Increased erosion and flooding impacts to Kinloch Road. Increased disruption to access, and higher maintenance costs for road managers. Buildings and land use impacted more frequently by flood events.
- Consequence: Channel breakout:** Restricted drainage and higher average water levels. Faster water flow and sediment deposition from Rees breakout.

The map includes a scale bar indicating 4 km and a coordinate grid.

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