

# **Waitaki District Plan Review – Natural hazards**

**Jean-Luc Payan**  
Manager Natural Hazards

19 April 2021

# Waitaki District Plan Review – Natural hazards

- River flooding
- Alluvial fan
- Land instability
- Fault rupture
- Liquefaction
- Coastal hazards



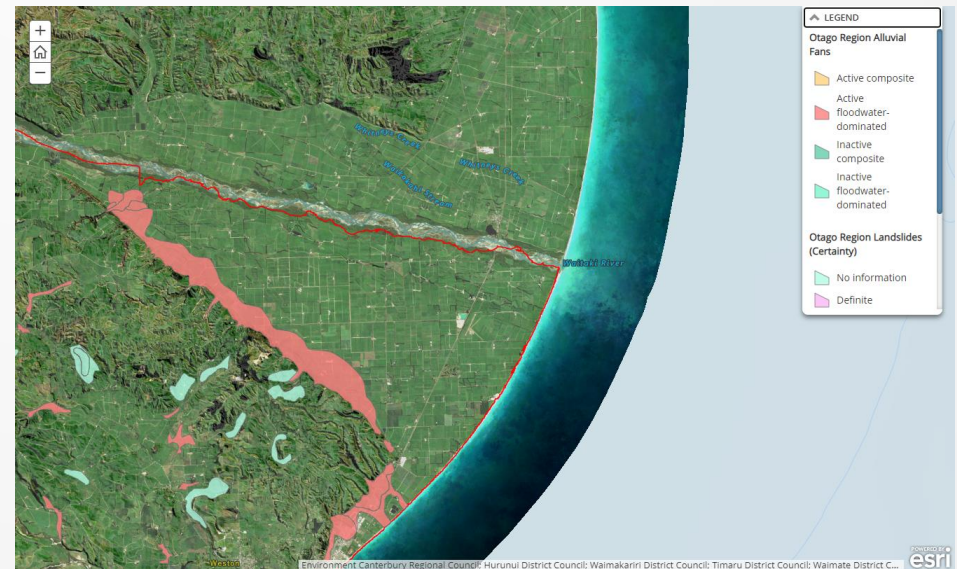
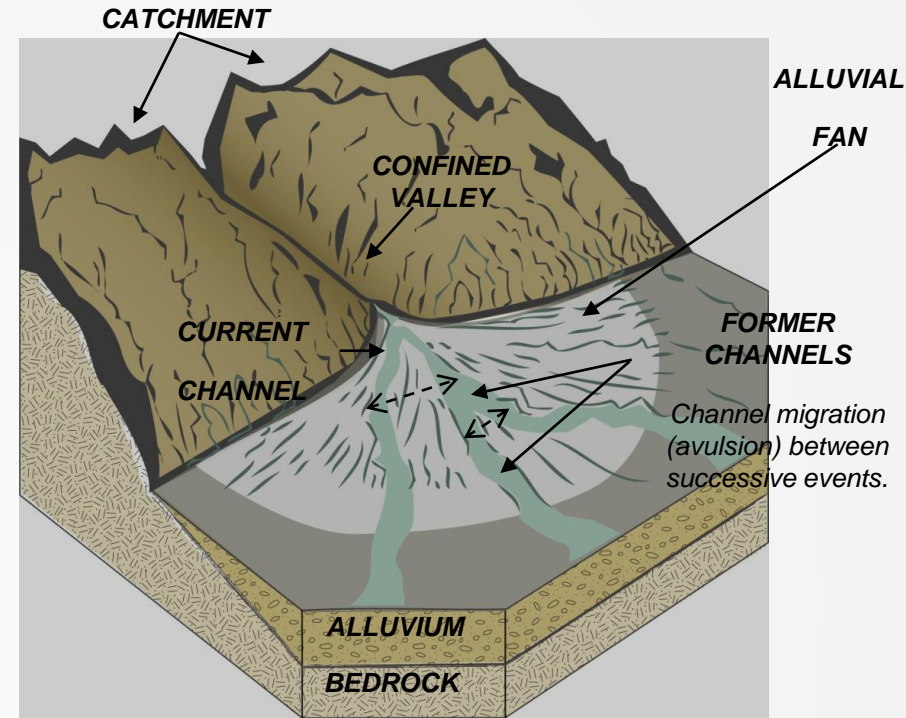
June 2013 – Kakanui River

# Waitaki District Plan Review – Flood

- Flood hazard maps available for the main catchments of the district and associated with river flooding (not stormwater)
- Lower Waitaki floodplain:
  - River flooding (from the Waitaki River or smaller well-defined channels)
  - Flooding due to surface runoff or overland flow and ponding

# Waitaki District Plan Review – Alluvial fan

- A sloping landform, shaped like an open fan
- Form where rivers exit a valley, allowing sediment laden flows to spread over a broad area
- As flows exit the valley, they lose energy and deposit sediment
- Hazards include debris flow, floodwater flow, sedimentation, erosion, channel migration.
- Can occur suddenly and without warning





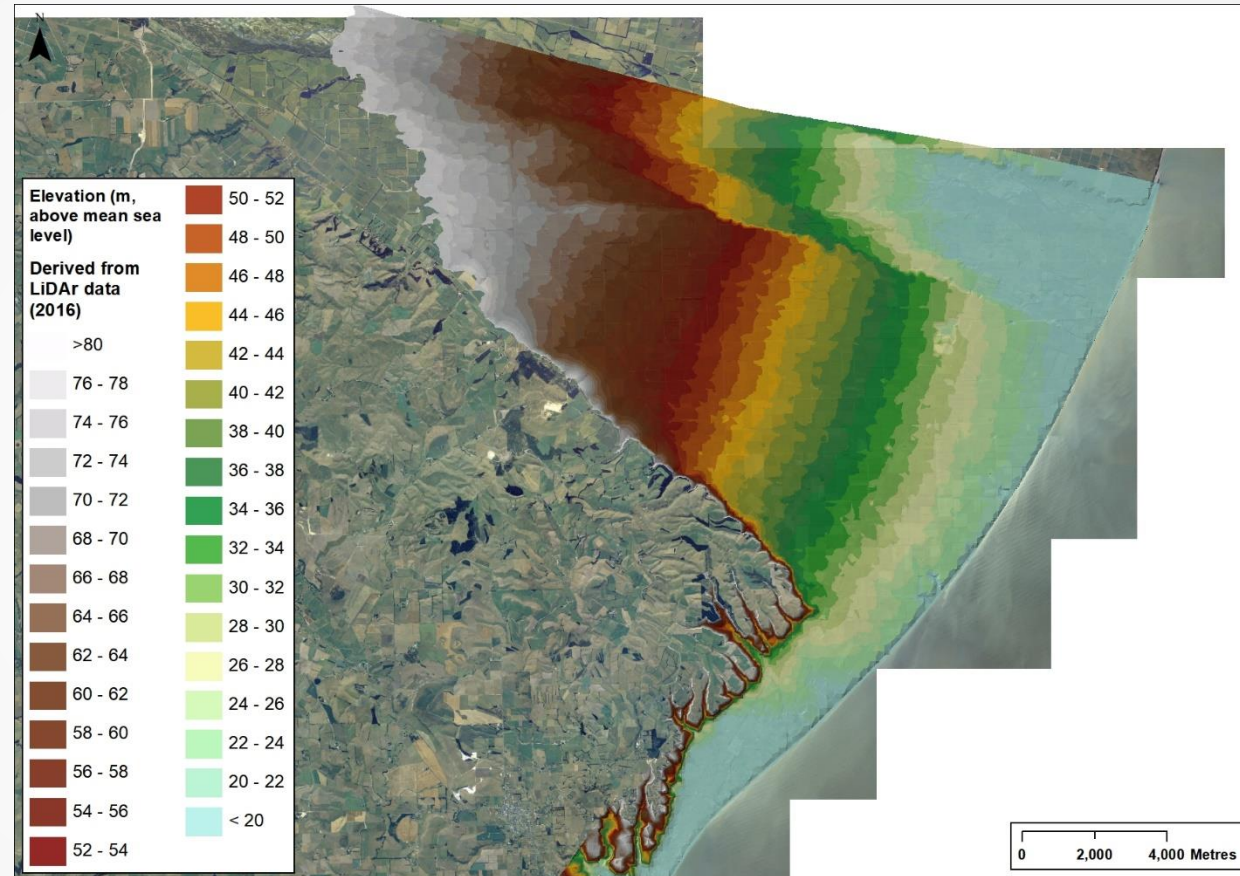
# Waitaki District Plan Review – Flood





# Waitaki District Plan Review – Flood

- Catchment area:  
11,860km<sup>2</sup>
- Braided channels
- Gently graded floodplain
- Awamoko Stream,  
Waikoura Creek,  
Henderson Creek
- Irrigation schemes
- Swales or remnant  
channels cross the plain
- Mainly agricultural land  
use



# Waitaki District Plan Review – Flood

- Flooding not associated to large streams but rather to overland flow paths
- Local features, can influence the flow direction and the depth and extent of flooding



Overland flow paths on the Waitaki River floodplain between Pukeuri and Richmond. 22<sup>nd</sup> July 2017 flood event (Photo courtesy of Heliventures)

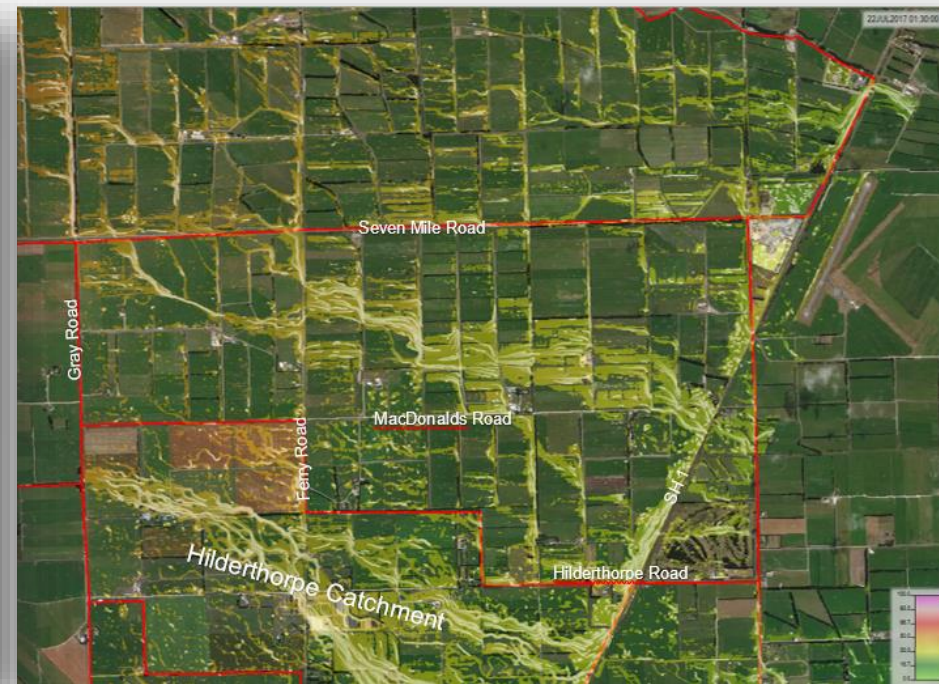
# Waitaki District Plan Review – Flood



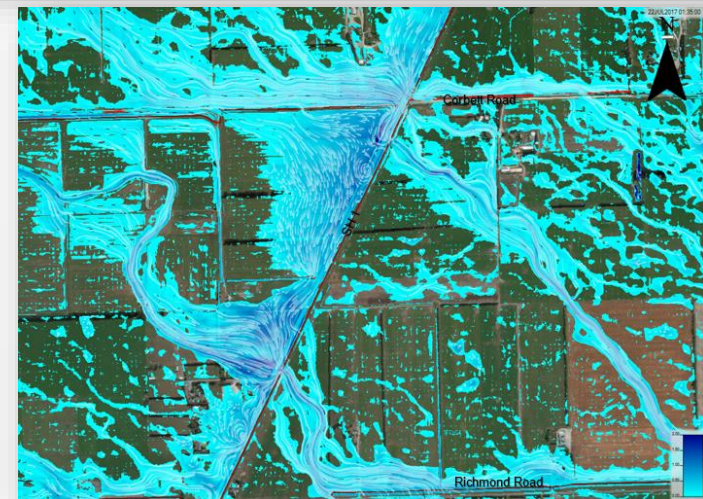
Richmond area. 22 July 2017 (Photo courtesy of Heliventures)



# Waitaki District Plan Review – Flood



**Modelled July 2017 flood event  
inundation**





# Waitaki District Plan Review – Summary

<https://apps.canterburymaps.govt.nz/WaitakiNaturalHazards/>

## Natural Hazards in the Waitaki District


[Overview](#)[Flooding](#)[Fault rupture](#)[Liquefaction](#)[Moeraki land instability](#)[Landslides and alluvial fans](#)[Coastal erosion and inundation](#)[Wildfire](#)[Tsunamis](#)

### Overview

This story map presents natural hazards information that has been obtained by Waitaki District Council, Environment Canterbury and Otago Regional Council to support the review of the Waitaki District Plan. The draft Waitaki District Plan will be released in Autumn 2021 for community feedback.

This information is presented to provide a general understanding of the natural hazards that pose a threat to the Waitaki community.

You can find more information about the District Plan review [here](#).



esri A Story Map



[www.orc.govt.nz](http://www.orc.govt.nz)

# Natural hazards information - Otago

<https://www.orc.govt.nz/managing-our-environment/natural-hazards/otago-natural-hazards-database>

Otago Natural Hazards Portal

Property Search | Flooding | Coastal Hazards | Alluvial Fans | Landslides | Earthquakes | **Regional Overview** | Natural Hazard photos | Reports

Regional Overview

Layer List

Operational layers

- ☒ Otago Flood Hazard
- ☐ Dunedin Urban Streams Flood Hazard (2GP)
- ☐ Taieri Flood Hazard (2GP)
- ☐ Milton Flood Hazard
- ☐ Dunedin Coastal Hazard - Area A
- ☐ Dunedin Coastal Hazard - Area B
- ☐ Dunedin Coastal Hazard - River flooding & ponding
- ☐ Alluvial Fans - Regional Scale
- ☐ Fan Landform Channels
- ☐ Fan Landform
- ☐ Landslides - Otago Region (Certainty)
- ☐ Storm surge Affected Areas all scenarios
- ☐ Storm surge Potential Inundation 50cm
- ☐ Tsunami Affected Areas all scenarios
- ☐ Tsunami - Potential Inundation 50cm all Scenarios at MHWS

60km

1,144,434.631 5,243,620.731 Meters

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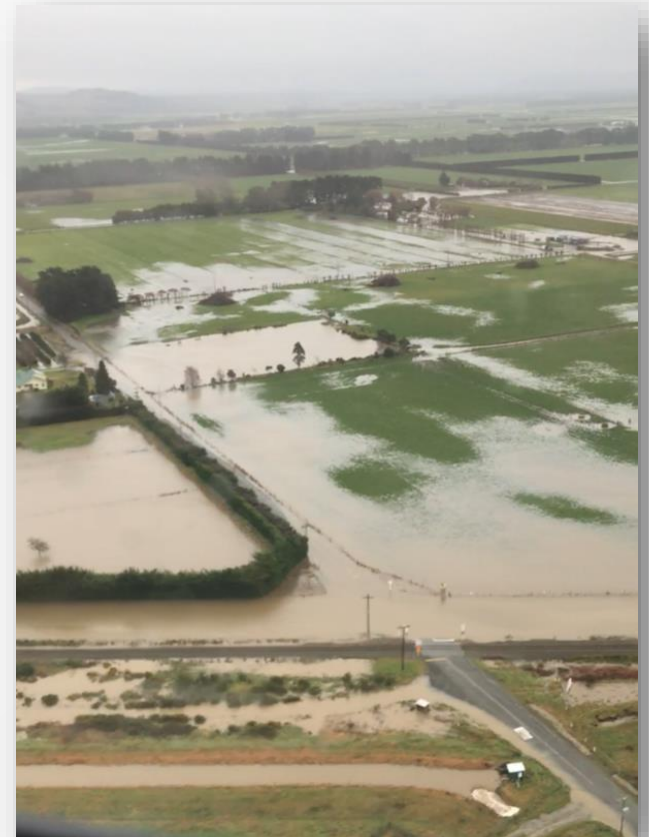
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# Thank you

**Otago Regional Council**  
**70 Stafford Street**  
**Private Bag 1954**  
**Dunedin**

Phone: 03 474-0827  
Free: 0800 474 082  
Fax: 03 477-9837



Hilderthorpe area - July 2017  
(Photos courtesy of Heliventures)

# Additional slides

June 2013 – Shag/Waihemo River

# Waitaki District Plan Review – Flood

- Flood mapping based on maximum known historical flood levels originally mapped at 1:25,000 scale (2002)
- Maps don't necessary represent the maximum extent of flooding
- Maps don't represent the land likely to be affected by flooding of a certain probability (e.g. 1% Annual Exceedance Probability/Return period)
- No quantitative likelihood of flooding associated with the maps but representative of large and infrequent events



# Waitaki District Plan Review – Flood

- Very limited hydrological data and limited flood water levels measurements from past events for most of the catchments located in the Waitaki District area
- The flood hazard maps were not derived from hydraulic modelling
- The flood hazard maps don't specifically account for the likely effects of climate change...
- ...but the effects of climate change are not likely to be such that they will result in significantly larger flood hazard extents

# Waitaki District Plan Review – Flood

- Minor updates to incorporate new flood hazard information, the acquisition of additional remote sensing data (mainly in 2016) and improved GIS
- Where justified, the flood hazard margin was amended to conform with local topography
- Spot checks after January 2021 heavy rainfall event
- Mapping approach matching the environmental setting, the scale of the catchments and floodplains (relatively large catchments) and the limited data (quantitative) available

# Waitaki District Plan Review – Flood

