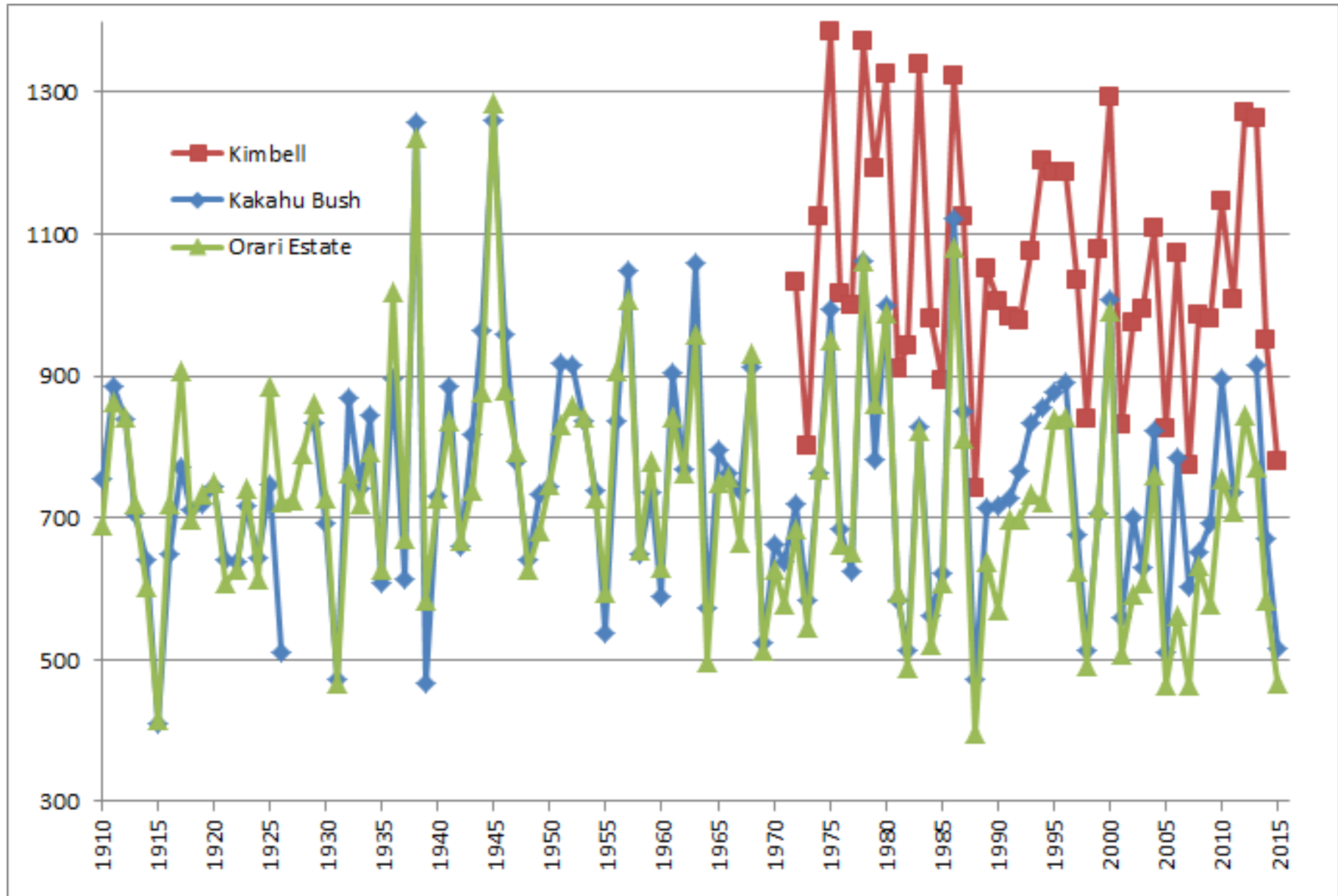


**Futureproofing  
Orari-Temuka-Opihi-Pareora  
(OTOP)**

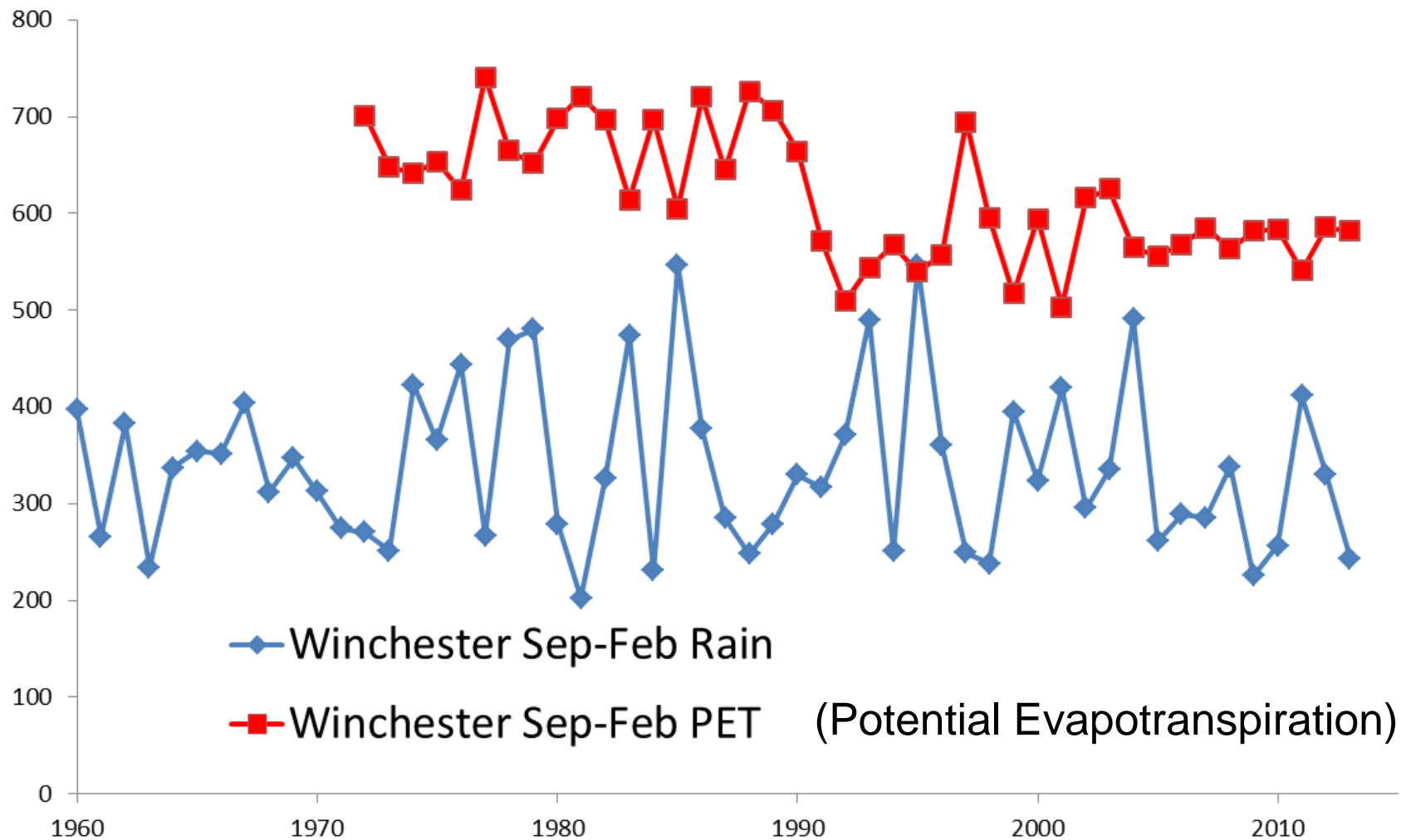
17 October 2016

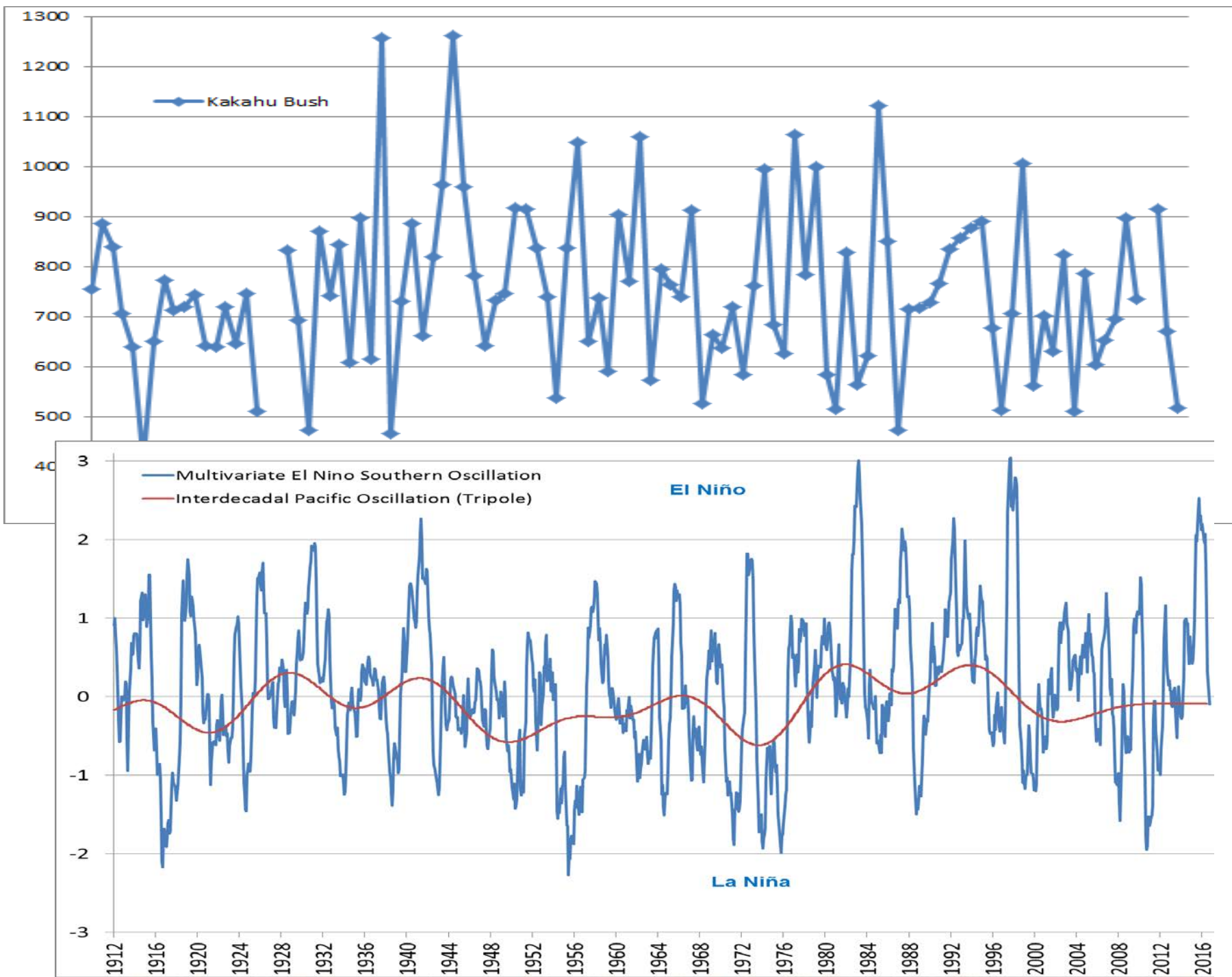
Brett Painter – CWMS Infrastructure

# Climate Context – Annual rainfall (mm)



# Winchester VCSN: Sept-Feb incl. Totals (mm)





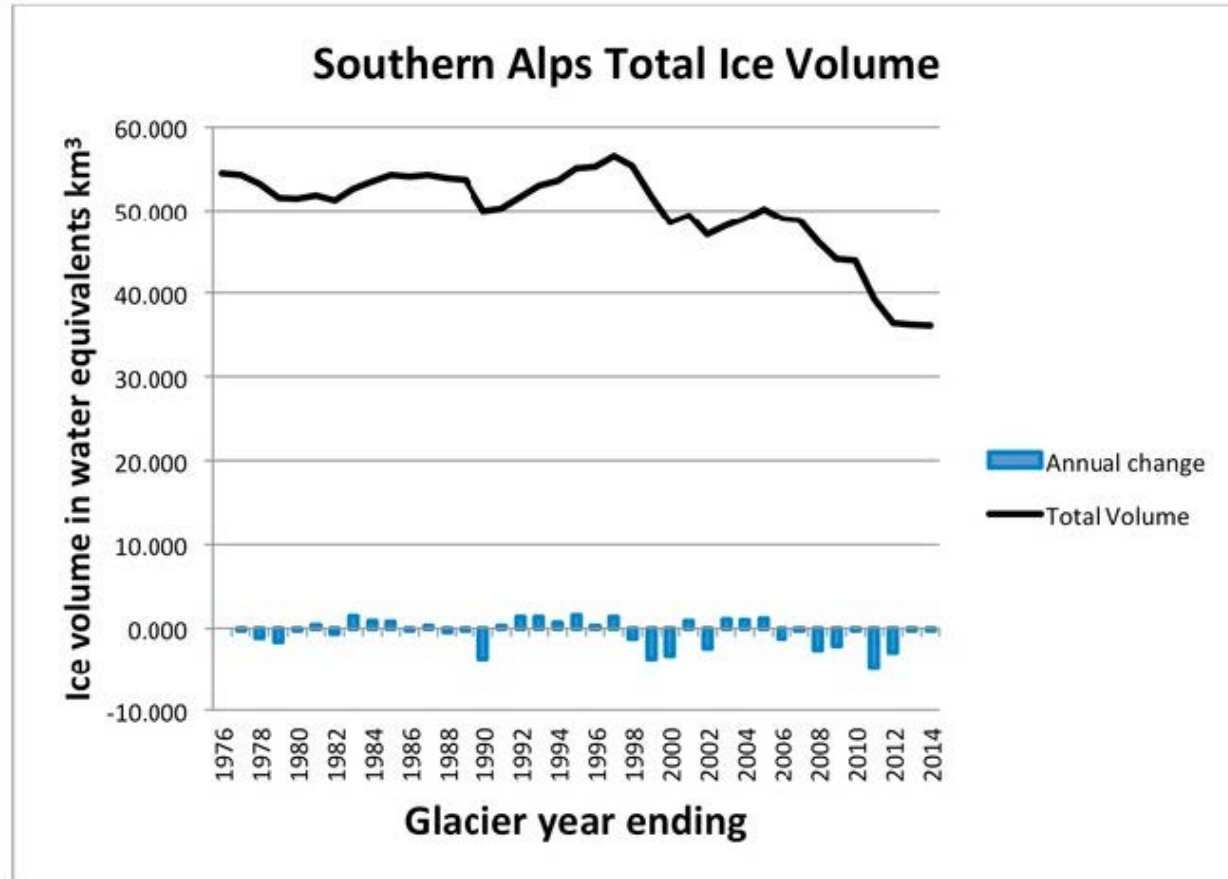
# Long term trends

## High country

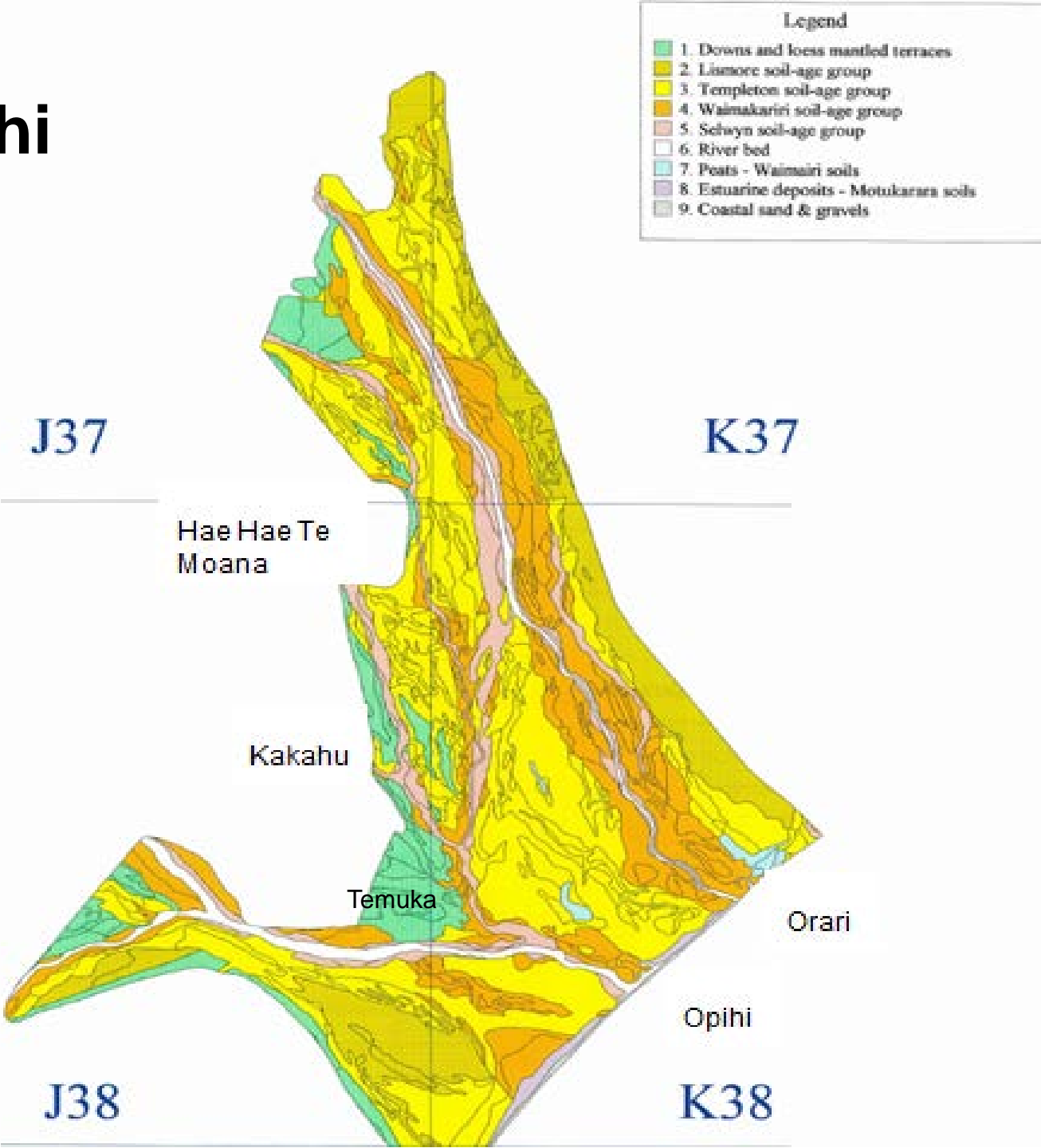
- Increasing min temperature and decreasing snow pack
- Increasing rainfall intensity

## Coastal

- Increasing evapotranspiration
- Decreasing rainfall
- Increasing drought length



# Orari/Opihi Geology



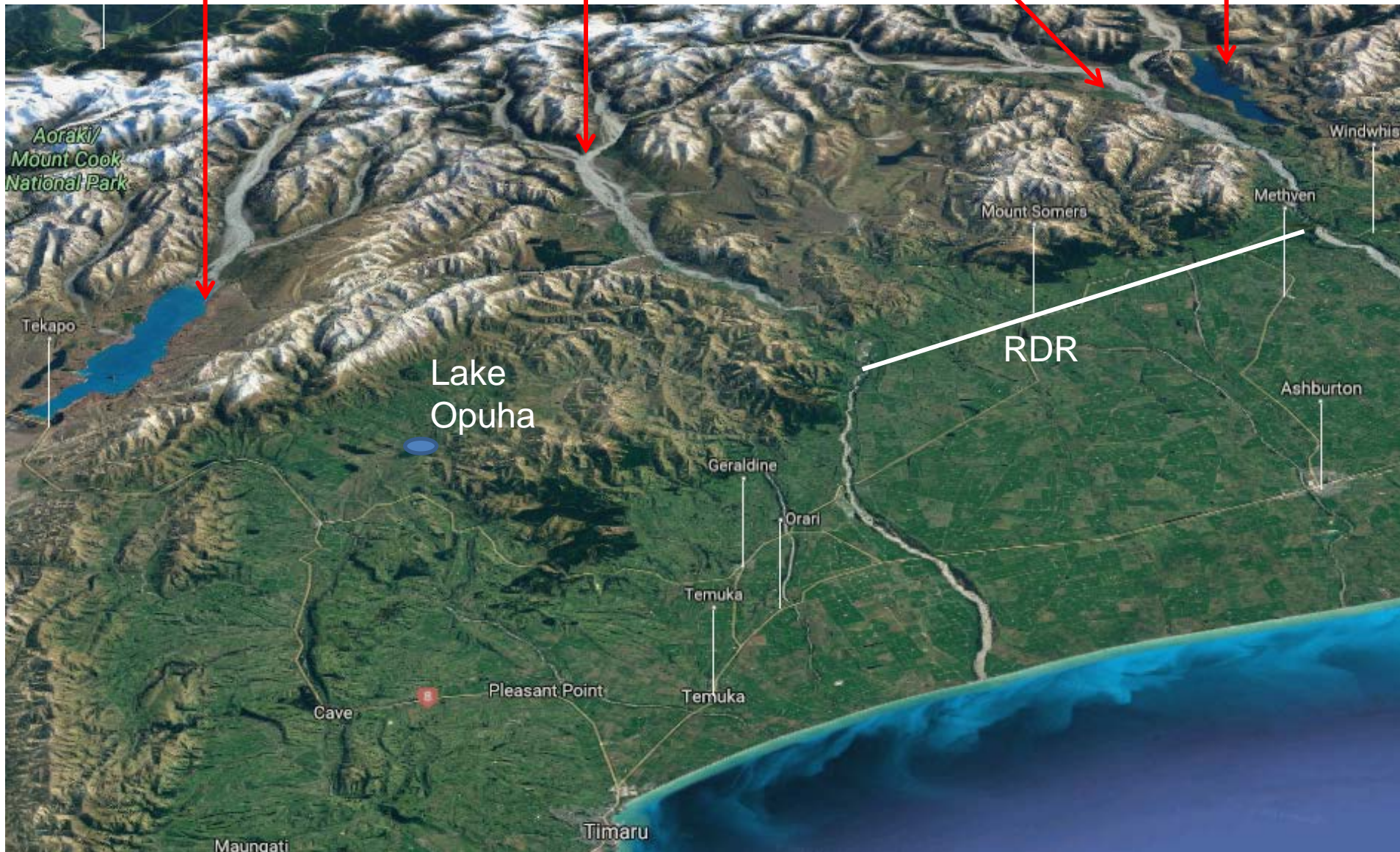


Lake Tekapo

Rangitata River

Rakaia River

Lake Coleridge



# The journey since 2010

- Preliminary Strategic Assessment
- Regional Distribution Model & Infrastructure Node Groups
- Preliminary water quality and COMAR assessments
- Aoraki Water Trust and Tekapo supply
- Irrigated Area Assessment
- LWRP stream depletion assessments
- Coastal demand study & Geraldine Water Solutions
- Water resource and infrastructure modelling



## Potential “top-up” demand due to Land and Water Regional Plan rules

- North OTOP: Conjunctive use zones, stream depletion assessments and increasing minimum flows expected to reduce reliability for  $\leq 9500$  ha irrigated land to  $< 50\%$ .
  - Coastal demand study addressed this
- South OTOP: stream depletion assessments expected to reduce reliability for 600-900 l/s.
  - No ‘spare’ Opuha water currently
  - Follow up investigations and demand study required

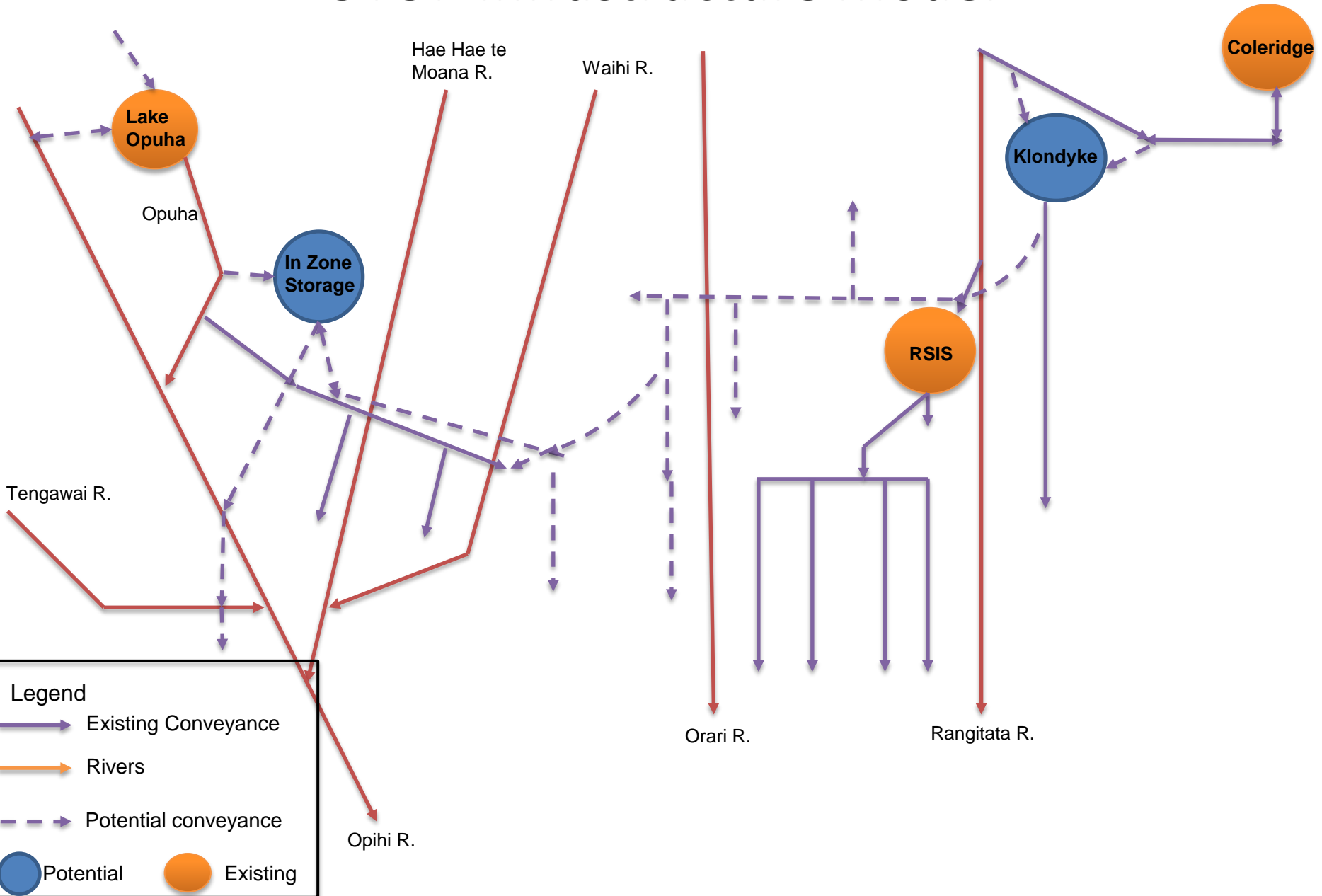
*Significant risks to future supply for existing irrigated area*

# North OTOP Demand Study

- ~135 potentially affected consent holders surveyed
- Additional 'new' users identified for consideration in modelling
- 61 positive surveys (9500 irrigated ha + 1700 new ha equiv.)
  - 82% would consider 'top up' reliability water
  - 35% would consider total replacement supply
  - 37% would consider additional supply

– Geraldine Water Solutions Ltd registered 4 May 2016

# OTOP Infrastructure Model



# OTOP Water resource and potential infrastructure

2015/16

- OTOP North: ~20 M m<sup>3</sup>/y and 2 m<sup>3</sup>/s max pipe capacity for (9500 ha 'top-up' plus 1700 ha new equiv.)
- OTOP South: (TBC) Stream depletion reliability top-up and new irrigation via Rangitata water swap.
- Opuha system improvements TBC (lake storage, on-farm storage, distribution efficiency, environmental releases).
- Optimisation required for Coleridge/Klondyke/OTOP storage sizing plus distribution sizing.

# South Canterbury Infrastructure Entities

- Environment Canterbury/MPI/CIIL
- Ashburton/Timaru/Mackenzie DC
- Ngāi Tahu
- CWMS Regional/Ashburton/OTOP Committees and catchment groups
- Trustpower/Rakaia River consent holders
- Rangitata Diversion Race
- Barrhill Chertsey Irrigation
- Rangitata South
- Opuha Water Ltd
- Geraldine Water Solutions/Alpine Water Solutions
- Aoraki Water Trust



# Regulatory and collaborative processes

- Land and Water Regional Plan (2015/16)
  - Orari River flow plan
  - Stream depletion assessments
- OTOP Healthy Catchments project (2016-19)
  - Sub-regional chapter to LWRP
  - Reviews river plans and groundwater allocation
  - Determines nutrient load limits
  - Considers infrastructure development concepts

# Next steps (2016/17)

IAF proposal to CIIL confirmed 11/10/16

- Additional demand assessments
- Future climate assessments and modelling
- Infrastructure optimisation (existing model)
  - Coleridge+pumps, Klondkye, OTOP storage, on-farm storage, distribution sizing
- Concept distribution design and costings
- Development entity governance and business case development

# Future Steps (2018-)

- South Canterbury entities raise shareholder funds, assume project leadership and future contracts with CIIL
- Feasibility assessments, updated infrastructure design and costs
- On-going supply/demand assessment
- Commercial arrangements (storage, distribution, pumping, hydro generation)