No salt in Creek

Before the 1850s

Native people

- Know the land thoroughly.
- Science learnt by walking it and living off its bounty.
- Know pigface can be sucked on hot days to replace salt.
No salt in Creek

Squatter Robert Scott

- Getting to know the land on his squatting run at Warracknabeal and the Yarriambiack.
- Science learnt by walking and riding across it and running sheep on it
- Has just gone for the nearest salt (for preserving food) at the ‘Salt Lake’ (Tyrrell?)
No salt in Creek

1851 Yarriambiack

Surveyor C.J. Russell
- Making a detailed map of the Yarriambiack Creek.
- Science learnt by walking and riding down it taking measurements all the way.
- Records that Saltbush and Pigface appear on the plains only north of Beulah.
No salt in Creek

1880s to 1890s

Selectors McKenzie

- Getting to know the land as the first selector to take up Mallee land in Beulah from the Squatters Bell and McGuinness in 1882.
- Science learnt by walking and riding across it and starting a farm on it.
- Government rules are that to keep the land the native plants have to be removed to create a farm.
Warning – places can go salty

1892 South Australia

Walter Ernest Wood

- Getting to know the land by growing up on a farm cleared from the Mallee bush on the Eyre Peninsula.
- Science learnt by walking and riding across it and noticing changes - especially in water
- Realises that the Mallee Trees on the land are somehow linked to good water.
Warning – places can go salty

Steam Train Drivers

- Getting to know the land by driving on the railroad in south west W.A.
- Science learnt by driving their steam trains across it and replacing water at dams.
- Notice that when the farms come and the trees are removed the water in their dams become too salty to use for the steam engines.
- Railway engineer Robert Bleesby solves problems by replanting trees in 1917.
Warning – places can go salty

1917 West Australia

Royal Commissioner Chairman Charles Edward Dempster

- Getting to know the land by leading the investigation into how best to develop the Mallee lands of south west W.A.
- Science learnt by investigation of what many people who know the land have seen, know and researched.
- Declares that $\frac{1}{3}$ of the Mallee Land that will be cleared for farming will suffer salt problems, but the farms are needed.
Can’t see any salt

After WW1

Soldier Settlers

- Getting to know the land as they are given land to farm after World War 1 (eg Sunraysia)
- Science learnt by walking and riding across it and starting a farm on it.
- Government rules are that to keep the land the native plants have to be removed to create a farm.
Science – don’t clear all the trees!

1924

West Australia

Government engineer/surveyor Walter Ernest Wood

• Has observed and investigated salinity problems now over a couple of decades.
• Is sure of the Science that when Mallee trees are fully removed, nearby water places go salty.
• Puts it into the Journal of the Royal Society of Western Australia.
• But people don’t want to hear, accept, or act on his warning.
• Clearing of Mallee lands for farms continues across WA, SA, Vic, NSW over the next couple of decades.

New discovery! First to tell about trees and salt!
Problem – wind erosion

1940s Victoria

Farmers

• Getting to know the land by living with changes that come with severe drought and wind erosion.
• Soil Conservation Authority set up in 1940 by Victorian Government to help them by researching better Science about the land and its problems.
Science - soil types

1944

Geographer/ Soil Scientist James Arthur Prescott

- Getting to know the land by studying the soils.
- 1931 published that there was a link between soil type, plants and climate. (as CSIR soil scientist)
- 1944 finished investigating all the soils of Australia and published the first *Soil Map of Australia.*
Problem – salinity!

1963 Victoria

Farmers

- Getting to know the land by living with changes that come with long term farming of a land that was forest.
- Some low-lying areas will no longer grow crops, and farmers don’t know what’s wrong.
- First salinity problems in the Beulah area are also recorded for the 1960s. (from our survey)
- Monitoring of water table depth and water quality begins in the Sunraysia where there is irrigation farming and salty water is soon found too close to tree roots.
Geomorphologist James Rowan and Soil Scientist Ronald Geoffrey Downes

- Getting to know the land by detailed investigation into the land as a system linking the land, water, plants and air parts of the environment.
- 1963 published that the Mallee Land Systems linking soil type, landforms, plants and climate. (as Soils Conservation Authority scientists)
- Still being used today as the basis for more in depth studies eg Technical Report 6 of the Mallee CMA which broke up the land systems into its different features.

New discovery! First to tell about our land systems!
What can we do about the salt?

1986 Victoria

Farmers as Landcarers
- Getting to know the land by finding solutions to problems of erosion, salinity etc
- Science learnt by groups of farmers with scientists fixing land problems, as a Victorian Government Landcare program with the first group at Winjallock near St Arnaud in 1986.
- 1989 Landcare became an Australian Government program, with the 1990s a Decade of Landcare.
Problem – salinity!

1987 Victoria

Saltwatchers

- Getting to know the land by finding out what the salinity levels are like where you live.
- More areas across the state have been put out of production with salt problems.
- Annual monitoring of surface waters for salt begins involving everyone in this statewide Science research
Science - Local farm trials and actions

1992

Birchip area

Birchip Cropping Group farmers and scientists

- Getting to know the land by detailed investigation on trial plots near Birchip.
- Publications of trials run on farms to members and reports online.
Science - pipeline replaces channels

1992 Wimmera-Mallee

Grampians Wimmera Mallee Water Engineers

- Have detailed maps, land systems information, and satellite photos to be able to plan a new water system.
- Science learnt by studying the theory and researching the local situation.
- Channel system lost a lot of water in bringing it to farms across such a large area.
- It leaked and created local salinity problems along it.
- In drought, channel system couldn’t run any more, and the water in dams had got salty.
Science - Salinity research and action

1993 Australia wide

National Dryland Salinity Program scientists

• Getting to know the land by detailed investigation in land systems for all aspects of salinity, local causes and local solutions, up to regional level eg Mallee-Darling.
• Three main publications: Dryland Salinity, its locations, causes, and options for farmers – trees still the key.
Problem – water quality!

1995-2010 Wimmera Catchment

Waterwatchers

• Getting to know the land by finding out what the quality of waters where you live.
• Salinity is not the only farm water problem, there is also levels of pH, turbidity, nutrients, hardness.
• Regular monitoring of any waters begins involving everyone in this local, regional & statewide Science research
Science - Water quality research and action

2000 Australia wide

National Action Plan for Salinity and Water Quality Scientists

- Getting to know the water/land (catchment) systems by detailed investigation in land systems for all aspects of water issues including salinity, local causes and local solutions, up to regional level eg Mallee-Darling.
- Combined Australian and all state governments in tackling water problems from 2000-2008
Bibliography

2 Pigface use is personal communication from Sturt Harradine in 2011.
3 Squatter Robert Scott returned from a salt trip on March 17 1848- recorded in the *Earliest Days of the Squatters* by Robert Scott et al, 1848, p 31, transcribed by Jeanie Clark 2013, currently available in Ballarat Library.
4 Surveyor Russells 1851 maps can be found at the Public Records Office under Yarriambiack Ck
6 Walter Woods early life and observations reported in *Silent Flood- Australia’s Salinity Crisis* by Michael Sexton, Sydney: ABC Books 2001 pp48- 50
7 Steam Train Drivers problems reported in *Silent Flood- Australia’s Salinity Crisis* by Michael Sexton, Sydney: ABC Books 2001 p49 includes reference to Robert Bleesby’s 1917 report “Railway Water Supplies in Western Australia, difficulties caused by salt in the soil.”
9 Soldier Settlements History is reported in *Silent Flood- Australia’s Salinity Crisis* by Michael Sexton, Sydney: ABC Books 2001 pp39-43

12 Soil Map of Australia, CSIROpedia, 2 March 2011, as published originally in CSIRO Bulletin nO 52 1944, Date Accessed = 12 May 2013
http://www.csiropenedia.csiro.au/display/CSIROpedia/Soil+Map+of+Australia
And James Arthur Prescott profile at James Arthur Prescott 1890-1987, CSIROpedia, 23 March 2011, Date Accessed = 12 May 2013
http://www.csiropedia.csiro.au/display/CSIROpedia/Prescott%2C+James+Arthur
and Water and land salinity, Murray Darling Basin Authority, 1996, Date Accessed = 12 May 2013
Community Involvement Tim Cummins, April 2013, pdf see page 4, Date Accessed = 12 May 2013
And Lessons of a rural legend live on, SA government obituary, 2007, news article reprinted on the web at
And Continuing use of 1963 Science in Disaggregation of the Mallee and Hopetoun Land Systems, Mallee Catchment Technical Bulleting no 6, July 2009, Date Accessed = 12 May 2013
And Rowan’s profile in Victorian Geomorphology Reference Group Profile of Members Vic Dept of Environment and Primary Industries, December 2012
15 Landcare referenced from “Where it all began” , DAFF, 11 Jan 2012, Date Accessed = 12 May 2013
http://www.daff.gov.au/natural-resources/landcare/publications/making_a_difference_a_celebration_of_landcare/section_1_-_where_it_all_began
And Saltwatch history referenced from Saltwatch, Victorian Landcare Gateway, June 2008, Date Accessed = 12 May 2013
http://www.landcarevic.net.au/resources/publications/books/manual/group-skills/other/saltwatch
17 Grampians Wimmera Mallee Water Pipeline referenced from " Milestones" GWMMWater, last entry Sept 2010, Date Accessed = 12 May 2013
And Breaking Ground, NSDP, Date Accessed = 12 May 2013
19 Wimmera Community Waterwatch history referenced from “What is Waterwatch? Wimmera CMA, Date Accessed = 12 May 2013