# Lesson 5: Threats to the water resources of the region

As you have learnt in previous lessons, liveability is influenced by both the natural and human environments. In the Wimmera region, access to fresh water and healthy river systems is one of the key factors that influence liveability. Farmers need water to grow crops and raise animals, townspeople need water for domestic uses such as cleaning, sewerage, cooking and drinking and industrial uses and, of course, the natural environment needs water too.

However, as in many places, the water resources of the Wimmera face many threats and the ways in which communities respond to these threats will impact liveability in the region for many years to come. As you prepare to complete fieldwork at a local Wimmera site, you need to be aware of some of these threats so that you can observe them in the field.

## Task 1

1. The following images show some of the threats to our river systems. In pairs, discuss each of these images and describe the threat.

**Figure 1** Cows eroding the river bank. Source: https://environmentvictoria.org.au/wp-content/uploads/2016/03/cows-river.jpg

**Figure 2** Fish kills due to poor water quality, Lower Wimmera River. Source: Wimmera CMA

Wimmera CMA

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**Figure 3** Wimmera River has dried up. Source: https://www.water.vic.gov.au/__data/assets/image/0019/512722/Wimmera-River-2-source-DEDJTR.jpg ]

**Figure 4** Wimmera River turned pink due to the combined cocktail of salt, algae, bacteria and gas and a lack of fresh water Wimmera River, Jeparit, 2006. Source: Wimmera CMA

**Figure 5** Drought, Wimmera River, Horsham, 2017. Source: Wimmera CMA

**Figure 6** Carp, invasive pest species, Lower Wimmera River. Source: Wimmera CMA

## Threat #1: less water in rivers

As temperatures have risen in the last 100 years or so, Australia's rainfall patterns have also changed. While some areas of Australia have become wetter, most of the continent has become drier. Rain that once fell on places like the Grampians and filled the rivers of the Wimmera region are now much less reliable, leaving the rivers with less water (see figure 3 above). In some places, this situation is made worse when too much water is taken from the river for towns or farms (see figure 1 above).

## Task 2

1. The following map shows the change in rainfall in Victoria between 1980 and 2020. Places shown in green have become wetter, while places in brown have become drier. The legend shows the change in rainfall in millimetres of rain in ten years. Most of Melbourne, for example, receives between 10mm and 20mm less rain every ten years.

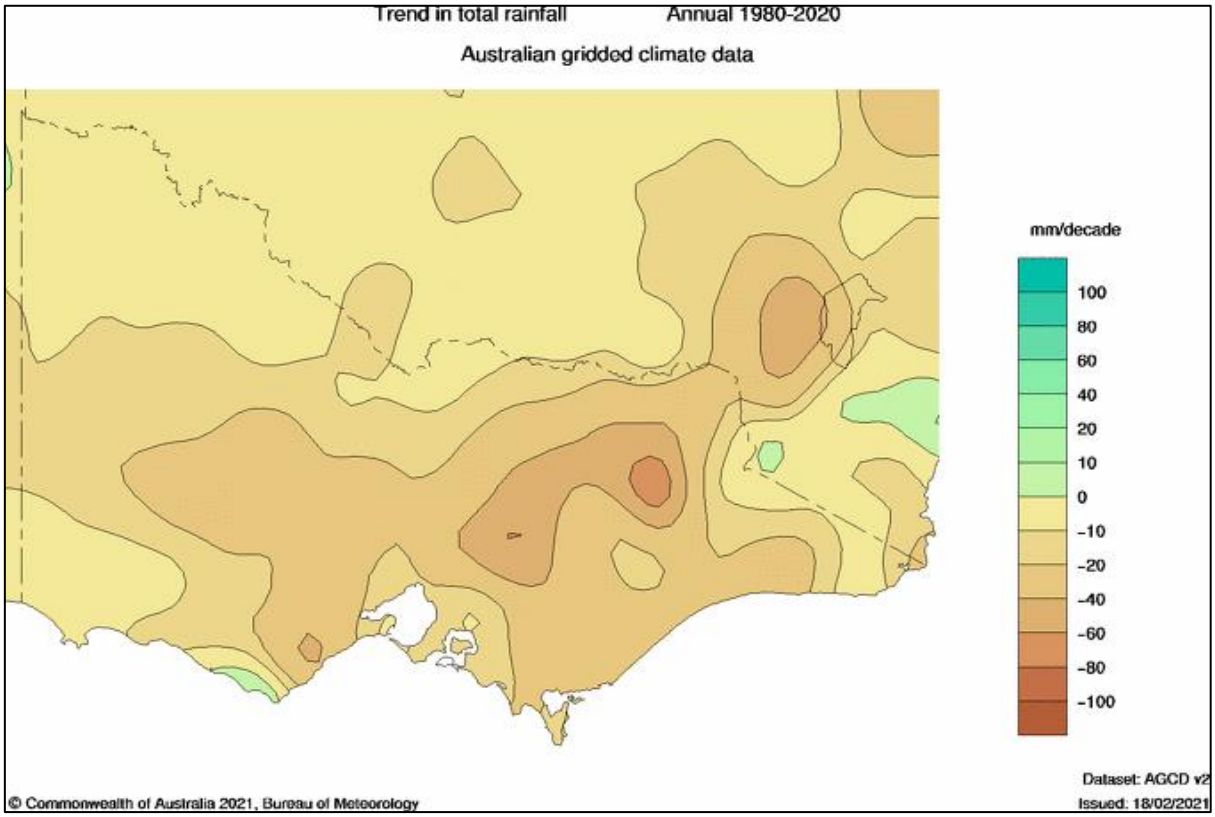


**Figure 6** Trend of annual rainfall in Victoria 1980-2020. Source: http://www.bom.gov.au/climate/change/index.shtml#tabs=Tracker&tracker=trendmaps&tQ=map%3Drain%26area%3Dvic%26season%3D0112%26period%3D1980

1. Describe the overall pattern of rainfall change in Victoria.

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2. What trend in annual rainfall in the Wimmera is shown in Figure 6?

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## Threat #2 Changes to the ways that the land is used

Have you ever thought about how water gets into a river? Most of it falls as rain on the surrounding land and then flows downhill to the river across the surface or through the ground. This land is called the river's catchment. Changes in the catchment, therefore, will impact the water in the river. The following map shows the way in which land is used in the Wimmera region.

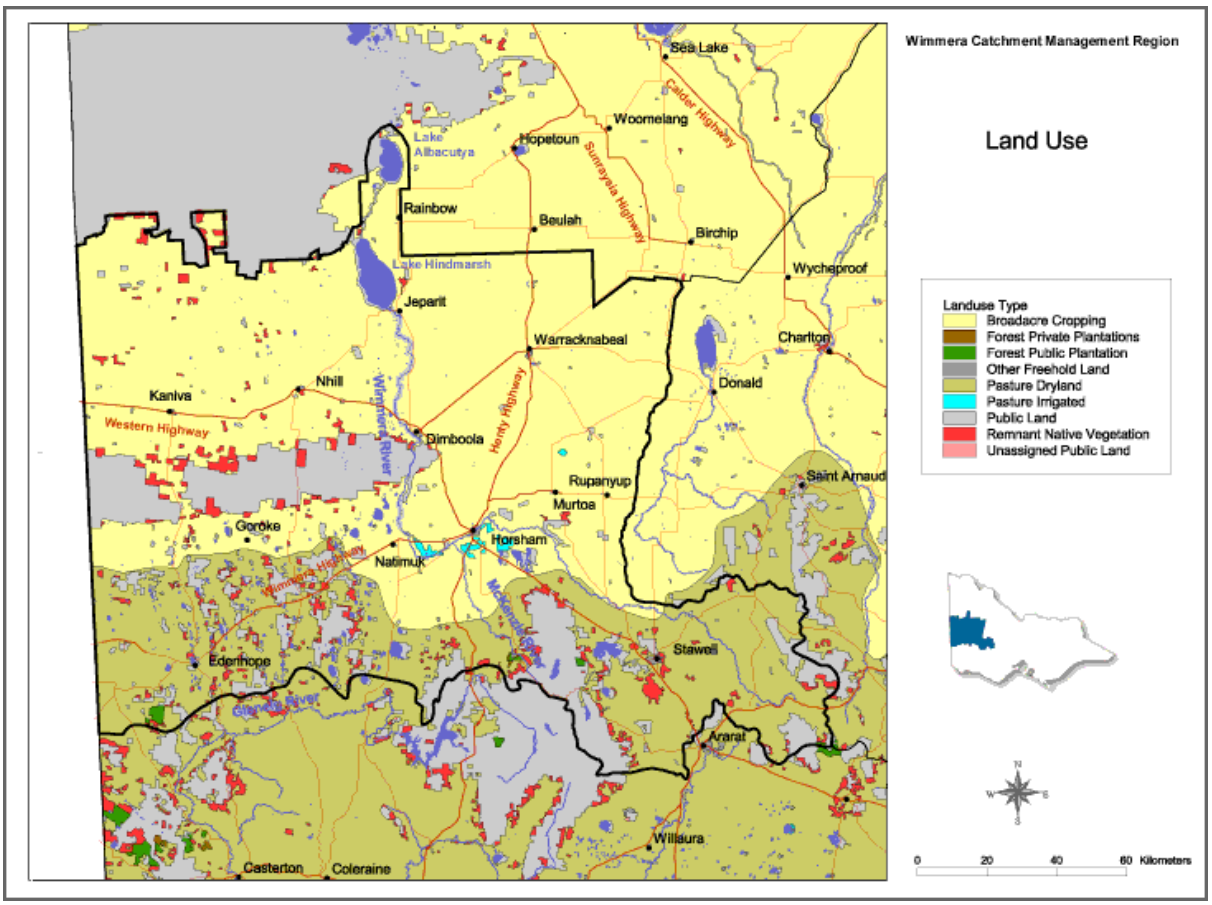


**Figure 7** Land use in the Wimmera region in 2019
Source: https://vro.agriculture.vic.gov.au/dpi/vro/wimregn.nsf/pages/wim_landuse-map

## Task 3

1. What are the two main land uses in the Wimmera region?

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2. What do you notice about the distribution of irrigated pasture in the region?

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Farmers need a reliable supply of water and so they usually build dams to collect the rainwater that flows across their property. This water is then available for them to use when there is no rain but it does mean that less water reaches the river.

## Skill: exploring water resources using Google Earth

Google Earth contains a mix of aerial photographs (taken from planes) and satellite images (taken from space). These images have become a vital tool for geographers studying the distribution of features on the Earth's surface. Follow these steps to explore some of the water resources of two places in the Wimmera region.

**Step 1**

Open Google Earth Pro and type 'Toolondo VIC' into the search bar. This town, east of Edenhope is shown as being in a dryland pasture area in figure 6. In this view, deep water is seen as very dark blue or black, while light blue areas show shallow or dry water areas.

1. Find a reservoir, farm dams, swamps and a stream in this region.
2. Describe the water resources of this region of the Wimmera.

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**Step 2**

Type 'Kaniva' into the search bar. This small town, in the north of the Wimmera region, is surrounded by broadacre cropping such as the growing of wheat and canola.

1. Zoom in and out of this region and look for examples of water resources such as farm dams and streams.
2. Compare the water resources near Kaniva to those near Toolondo. When comparing two places, point out both similarities and differences.

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**Step 3**

Type 'Weir Park Horsham' into the search bar. This will take you to a view above the city of Horsham beside the Wimmera River.

1. What is the structure built across the river at this point? _____

2. What do you think is the purpose of this structure?

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3. How might it interfere with natural processes such as fish migration?

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## Other threats

As well as changes to water flows and land use there are also many other threats to the water resources of the Wimmera. These occur at a variety of scales. Some are at the local scale, affecting just a small area such as the weir in the previous example. Others are at the regional scale, affecting most of the Wimmera. Others are national and others, such as climate change, are occurring at the global scale.

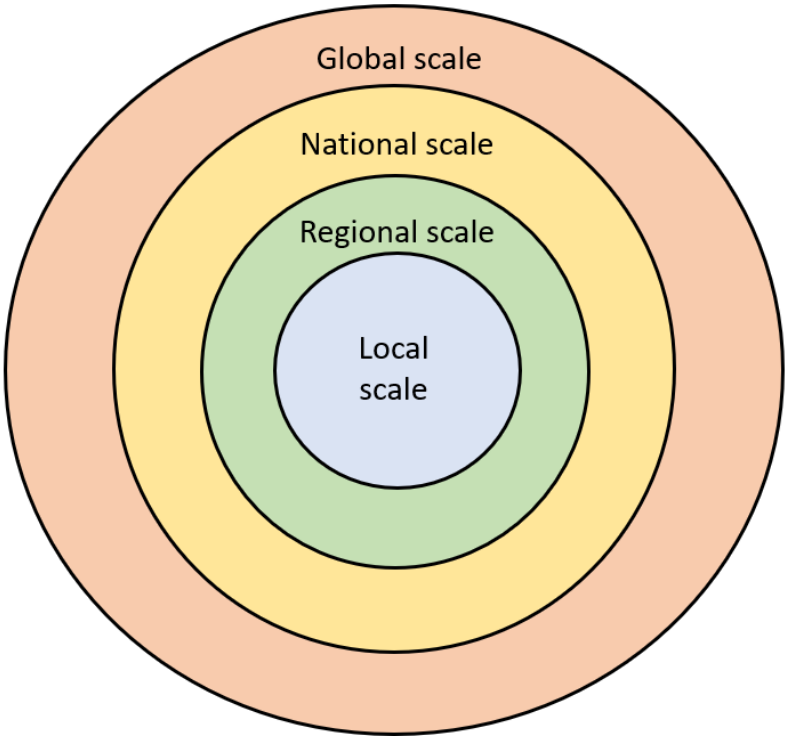


**Figure 8** The geographic concept of scale.

## Task 4

In teams of two, select one the following threats to water resources. Research this threat using the sources listed and construct a one-page fact file on this threat in the Wimmera. Your fact file must include a description of the threat, an image with a source and a statement outlining the scale at which this threat is occurring.

**Threats**

- Land use changes, for example, changes from grazing to cropping
- Erosion due to lack of vegetation
- Salinity and rising water tables
- Algal blooms
- Invasive species: especially carp (see figure 4)
- Firewood harvesting and recreation
- Cows grazing in wetland areas (see figure 2)
- Water pollution

**Useful Sources**

- https://wimmera.rcs.vic.gov.au/themes/water/rivers-and-streams/ Scroll down to 'Major threats and drivers of change'.
- https://wimmera.rcs.vic.gov.au/themes/water/wetlands/ Scroll down to 'Major threats and drivers of change'.
- https://wimmera.rcs.vic.gov.au/themes/water/groundwater/ Scroll down to 'Major threats and drivers of change'.