

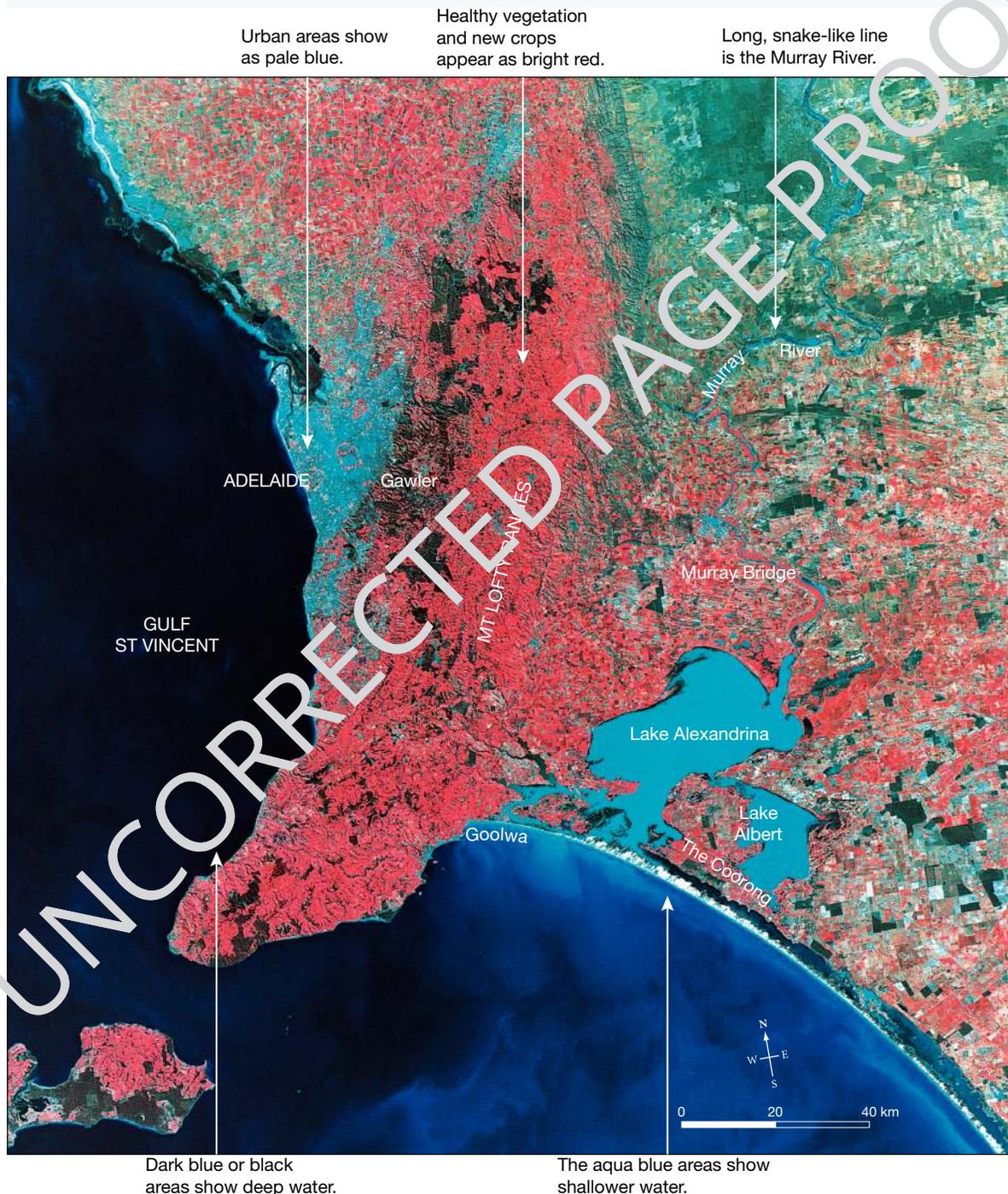
# 15.3 SkillBuilder: Understanding satellite images

## 15.3.1 Tell me

### What are satellite images?

Satellite images are images that show parts of our planet from space. They are taken from satellites and transmitted to stations on Earth. Satellites can collect a variety of data, including standard photographic imagery, colour infra-red and radar data. They can show Earth in close-up or from far away. Special computer techniques allow data from satellites to be used to highlight patterns on the Earth's surface.

**FIGURE 1** A false-colour satellite image of the Mt Lofty Ranges



**Source:** © Commonwealth of Australia. Geoscience Australia 1982.

The most common type of satellite image comes from Landsat satellites. They are positioned 700 kilometres above the ground, orbiting the Earth every 100 minutes, and they use special cameras to detect variations in the light reflected from features on Earth. The process of detecting and recording the reflection of light is known as remote sensing.

### Why are satellite images useful?

Satellite images help geographers observe a much larger area of the Earth's surface than photographs taken from an aircraft. They can also provide data relatively quickly, so they are often used to monitor natural disasters, including cyclone activity, bushfires and floods. Digital information from satellites is beamed to stations on Earth as radar or microwave signals. Computers are then used to enhance the images, which enable the study of landforms, farmland, disasters, environmental change, weather patterns and even military targets.

### Model

Different features can be highlighted in satellite images by selecting only certain bands of light reflected from Earth. These bands of light are assigned false colours to help reveal spatial patterns more clearly. In **FIGURE 1**, showing the Mt Lofty Ranges in South Australia, the labels point out the patterns.

## 15.3.2 Show me

### How to interpret a satellite image

#### Resources

 **Video eLesson** Understanding satellite images (eles-1643)

#### You will need:

- a satellite image.

#### Procedure:

When you look at images taken from above, including satellite images, it can be confusing but you can improve with practice. The following steps can help you to systematically gather the most information you can from images. It is easier if you consider an image of a familiar place, but geographers are also interested in unfamiliar places.

#### Step 1

Read the title and check for the date the image was taken. Read any accompanying information.

#### Step 2

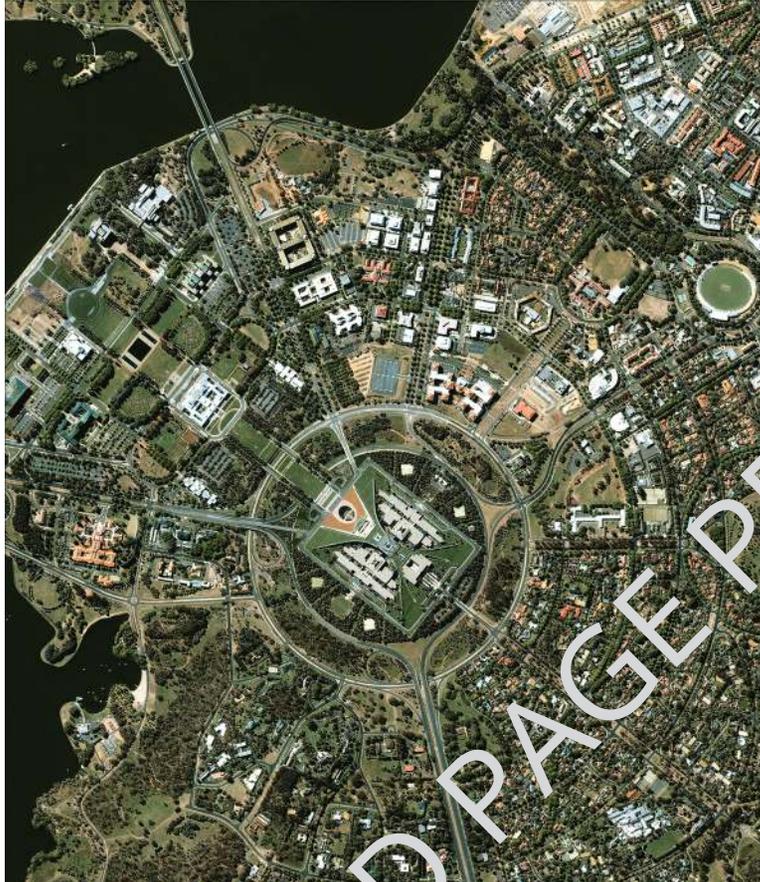
Identify the main features of the image. What stands out? For example, roads will appear as continuous lines intersected by other lines. Rivers tend to be snake-like, and sometimes you notice trees lining the riverbanks. Dwellings have rectangular roofs and are often clustered together.

This image of Canberra is centred on Parliament House, although the prominent central flag mast does not stand out. There appear to be wide circular roads and, if you can zoom in, cars are visible.

#### Step 3

Look for and label the biophysical features. For example, the black area is Lake Burley Griffin. Green vegetation in a city might be planted or it might be remnant vegetation. Look at the patterns of green to make predictions. Remnant (or remaining) vegetation will often be in an irregular pattern, whereas planted vegetation may be in rows.

**FIGURE 2** Satellite image of Canberra, by GeoEye, 26 September 2011



**Source:** © 2016 Digital Globe

#### Step 4

Look for and label the built features, such as roads, bridges, sports stadiums and residential housing. Again, look at patterns. Areas of small roofs with road access and surrounding vegetation suggest detached residential housing.

#### Step 5

Some colours, patterns and shapes may still be puzzling. Obtain a map of the same area — try an atlas or street directory, Google Maps, Bing or Nearmap. Find names of key features to use in your description. If the features you have identified are shown on the map, check whether your analysis so far matches the map. Use the map to investigate the aspects that are still puzzling. Be aware that the image may have been taken at a different date from the date the map was produced; this might explain other differences in what you see.

#### Checklist

I have:

1. checked the title
2. identified biophysical and built features
3. compared the satellite image with another map to check my interpretation.

#### **on** Resources

 **Interactivity** Understanding satellite images (int-3139)

### 15.3.3 Let me do it

Complete the following activities to practise this skill.

#### 15.3 ACTIVITIES

If you have ever holidayed at the Gold Coast, you may have visited the Currumbin Wildlife Sanctuary. In **FIGURE 3**, Currumbin generally has more natural vegetation than much of the Gold Coast, partly because it is more difficult to build on the steep hills there, and partly because the forests are valued as wildlife habitat. Currumbin is a popular surf beach and holiday destination.

**FIGURE 3** Satellite image of Currumbin on Australia's Gold Coast, 8 May 2000



**Source:** Satellite image courtesy of GeoEye. Copyright 2009. All rights reserved

Using the image of Currumbin, answer the following questions.

1. Look carefully at the satellite image and make a list of features you can recognise.
2. Find the bridge that crosses Currumbin Creek. Are there any cars on the bridge?
3. What impact have visitors had on the plant life behind the beach?
4. Go to Google Maps and zoom in to Currumbin Beach, Queensland, to find a map of the area shown in **FIGURE 3**. Turn the satellite layer on. What **changes** can you see?
5. Suggest how the biophysical features and topography have influenced the settlement pattern in this area.