

Water... WOW!

STAGE 3 EDUCATION

Module 3: Rainfall, Droughts & Floods

Fresh water is not evenly distributed across the surface of the Earth, with serious consequences for life and the lifestyles of people.

The amount of available water also changes over time: droughts and floods are severe cases highlighting the uneven distribution of water through time.

In this module, students will:

- create a story about mythical creatures, following the style of a Dreaming Story
- reflect on and suggest improvements to scientific design
- explore the Bureau of Meteorology website to obtain data
- analyse a dataset from the Bureau of Meteorology to answer questions about rainfall

www.georgesriver.org.au



Module 3: Rainfall, Droughts & Floods



Teacher Background

Fresh Water is Not Evenly Distributed Across the Surface of the Earth (GE3-1 Describes the diverse features and characteristics of places and environments)

In *Module 2: Virtual Water*, students learned that the amount of fresh water on Earth is far less than the total amount of water on Earth, which is mostly salt water in oceans. This module and following modules relate to the distribution of water, particularly accessible fresh water that is so vital to sustaining people's lives. The Aboriginal Dreaming Story of Tiddalik the Frog can be used to remind students that fresh water is not evenly distributed across the surface of the Earth, with serious consequences for life and the lifestyles of people. The amount of available water also changes over time: droughts and floods are severe cases highlighting the uneven distribution of water through time.

Droughts and Floods (GE3-1: Describes the diverse features and characteristics of places and environments, GE3-2: Explains interactions and connections between people, places and environments)

Large parts of Australia are dry for most of the time, but not necessarily classed as being in drought. A drought is defined as occurring when a region has received much lower than average rainfall for that region over the previous three months. 'Much lower' means that, based on rainfall records, there was higher rainfall in the region for 90% of the time prior to the drought. The Bureau of Meteorology measures rainfall and has records since the 1860s. In Australia, there have been decreases in rainfall since 1994, which many scientists attribute to climate change. The most severe drought across Australia on record occurred recently, from 2003 to 2012. New South Wales went back into drought in the middle of 2017. The extended dry conditions led to extreme fires across Australia in the summer of 2019-20.

Climate change does not just cause warming and drying, it more generally drives more extreme weather events, including storms and floods. The Georges Riverkeeper factsheet [Flooding in The Georges River](#) provides an overview of the history and effects on property of flooding in the Georges River catchment.

Sequence for Module 3 : Rainfall, Droughts & Floods

Syllabus Outcomes	<p>GE3-1 Describes the diverse features and characteristics of places and environments.</p> <p>GE3-2 Explains interactions and connections between people, places and environments.</p> <p>EN3-2A Composes, edits and presents well- structured and coherent texts.</p> <p>EN3-5B Discusses how language is used to achieve a widening range of purposes for a widening range of audiences and contexts.</p> <p>MA3-11MG Selects and uses the appropriate unit to estimate, measure and calculate volumes and capacities, and converts between units of capacity.</p> <p>MA3-18SP Uses appropriate methods to collect data and constructs, interprets and evaluates data displays, including dot plots, line graphs and two-way tables.</p>
Learning Intentions	<p>For students to:</p> <ul style="list-style-type: none"> ◆ create a story about mythical creatures, following the style of a Dreaming Story ◆ reflect on and suggest improvements to scientific design ◆ explore the Bureau of Meteorology website to obtain data ◆ analyse a dataset from the Bureau of Meteorology to answer questions about rainfall
Teaching & Learning Activities	<p><u>Inquiry Question</u>: <i>Is it going to rain today?</i></p> <ul style="list-style-type: none"> ◆ View the Dreaming Story of Tiddalik the Frog [2:42 duration] to generate discussion that the change in water availability & distribution over time (i.e. droughts) has been occurring in Australia for many, many years and considered important enough for Aboriginals to create a story that was passed from generation to generation over thousands of years. GE3-1, GE3-2 ◆ In groups, students follow the style of Tiddalik the Frog to create stories about mythical creatures that are responsible for water moving through their urban landscape. After being divided into three groups and through creative story-telling, students explain: i) the transportation of water to taps, ii) the journey of water flushed down toilets and iii) what happens to water that enters the drains on our street. Bring the class together to interweave their whole imagined narrative of water movement through their landscape, into one story. EN3-2A, EN3-5B ◆ Ask students: Is it going to rain today? Tomorrow? Next week? How do we make these predictions? Can we access data to help us make better predictions? ◆ Pose inquiry questions to students: Why do we need to measure rainfall? What do we do with rainfall measurements? How is it recorded? How can it be accessed? ◆ Introduce students to the Bureau of Meteorology (BOM) dataset Climate Data Online. Lead students through a method of obtaining rainfall data from Climate Data Online. See below for

	<p>instructions.</p> <p>Select Using Text tab > 1. Selected: Daily rainfall (Data about Rainfall in dropdown box and click on circle for Type of data, Daily Observations) 2. Enter a location (e.g. choose the suburb where your school is located) and click Find > Select Matching Town > Select Nearest Bureau station > 3. Get Data. Daily and monthly rainfall data for the chosen location will be shown > Click on Plot statistics and this year at the bottom of the datasets and a monthly rainfall histogram will be created.</p> <ul style="list-style-type: none"> ◆ Analyse selected data. How much rain has been recorded in the last month? Compare to previous months. What's the average annual rainfall for the selected location? MA3-11MG, MA3-18SP ◆ Find newspaper articles about drought across NSW and discuss with students OR discuss Georges Riverkeeper Factsheet: Flooding in the Georges River GE3-1, GE3-2. ◆ Extension: Rain gauges are great for measuring rain in small areas, but what about large areas? Are they accurate for measuring rain across the globe (see https://eldoradoweather.com/climate/world-maps/world-annual-precip-map.html for average precipitation across the world)? Discuss the limitations. View video Measuring rainfall to ascertain a better method used by meteorologists.
Resources	<ul style="list-style-type: none"> > Tiddalik the Frog https://youtu.be/0y3Ta5xcKV4 > Climate Data Online http://www.bom.gov.au/climate/data/index.shtml > Total annual rainfall across continents https://eldoradoweather.com/climate/world-maps/world-annual-precip-map.html > Measuring Rainfall http://education.abc.net.au/home#!/media/2159478/for-good-measure
Feedback	<p>Your feedback is important to us. Please complete this quick online survey: http://bit.ly/ModulesFeedback</p>

www.bom.gov.au/climate/data/

Australian Government
Bureau of Meteorology

HOME | ABOUT | MEDIA | CONTACTS | Enter search terms | Search

NSW VIC QLD WA SA TAS ACT NT AUSTRALIA GLOBAL ANTARCTICA

Bureau Home > Climate > Climate Data Online

Climate Data Online

About Climate Data Online | How to get data - FAQs | Technical help

Use the **Text** or **Map** search below to view daily and monthly statistics, historical weather observations, rainfall, temperature and solar tables, graphs and data.

For additional data types, or specific dates and localities go to [Weather Station Directory](#)

Additional data available

- Data services requests
- Service announcements
- Quality control updates

Select using Text | Select using Map

1: Selected: **Daily rainfall**

Data about: Rainfall

Type of data: Observations | Statistics

Daily | Monthly | Daily | Monthly

Daily rainfall data and graphs for a selected year. Data download for one or all years.

2: Select a weather station in the area of interest

revesby | Find

OR - search by Position

Matching towns (click one to select)

- Revesby, NSW, 33.96°S, 151.01°E
- Revesby Heights, NSW, 33.97°S, 151.02°E

More information: [Geoscience Australia](#) (opens new window)

3: Get the data

If you already know the station number you may enter it below instead of using the search above.

Station number | Get Data (Opens in new window) | Save | Clear

Page updated: 13 December 2013

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Select using Text **Select using Map** [Help](#)

1: Selected: Daily rainfall

Data about

Type of data
Observations: Daily Monthly
Statistics: Daily Monthly

Daily rainfall data and graphs for a selected year. Data download for one or all years.

2: Select a weather station in the area of interest

OR - search by

Matching towns (click one to select it)

- Revesby, NSW, 33.96°S, 151.01°E
- Revesby Heights, NSW, 33.97°S, 151.02°E

Nearest Bureau stations (click one to select it)

Only show open stations (may no longer report all data types)

- 066168 Milperra Bridge (Georges River) NSW (4.2km away)
- 066148 Peakhurst Golf Club NSW (5.0km away)
- 066137 Bankstown Airport AWS NSW (5.1km away)
- 066161 Holsworthy Aerodrome AWS NSW (6.7km away)
- 066204 Oyster Bay (Green Point Road) NSW (7.4km away)

3: Get the data

If you already know the station number you may enter it below instead of using the search above.

Station number (opens in new window)

Page updated: 13 December 2013

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Bureau Home > Climate > Climate Data Online > Daily Rainfall

Daily rainfall

Bankstown Airport AWS

[About this page](#)

1 year of data | All years of data | PDF

Observations of Daily rainfall are nominally made at 9 am local clock time and record the total for the previous 24 hours. Rainfall includes all forms of precipitation that reach the ground, such as rain, drizzle, hail and snow. [About rainfall data](#)

Station: Bankstown Airport AWS

Number: 66137

Opened: 1968

Now: Open

Lat: 33.92° S

Lon: 150.99° E

Elevation: 7 m

[Details](#)

Show in table... ▾

Key: Units = mm 12.3 = Not quality controlled. *i* = Part of accumulated total
Move mouse over rainfall total to view the period of accumulation.

2018 ▾	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Graph												
1st	0	0	0	0	0	0	0	0	1.8	0	0	0
2nd	0	0	0	0	0.2	0	0.2	0	1.0	0	0	0
3rd	1.2	0	0	0	0	0	4.0	0	0.4	0.2	0.2	0
4th	1.0	0	0	0	0	0	0.2	0	12.8	3.0	0	0
5th	0	0	0	0	0	0	0.2	0	0.2	50.0	0	1.0
6th	0	0	2.0	0	0	23.0	0.2	0.2	1.0	4.0	0.2	2.4
7th	0	0	5.4	0	0	11.0	0	1.8	4.0	1.8	0	0.2
8th	0	0	0	0	0	0	0	0	07.0	2.0	17.0	0
9th	0.2	0	0	0.2	0	7.2	0	0	1.0	0.2	0	0
10th	3.0	0	1.0	0	0	1.8	0	0	0.2	0.2	0	0
11th	0	0	0	0	0	0	0	0	0	12.0	0	0.2
12th	0	0	0	0	1.0	0.2	0	0	0	15.0	0	0
13th	0	0	0	0	0.2	0.4	0	0	0	4.0	0	2.4
14th	0.2	0	0.8	0	0	0.2	0	0	0	32.8	0	26.8
15th	0	0	0	0	0	0	0	0	0.2	2.0	0.2	7.0
16th	0	0	0	0	0.2	0	0	0	0	3.0	0	24.8
17th	0	0	0	0	0	0	0	0	0	0.0	0	0
18th	0	0	0	0	0	0	0	0	0	28.4	0.4	0
19th	0.4	0	0	0	0	5.0	0	0	0	14.4	0	0
20th	0	0	0	0	0	11.0	0	0	0.4	0	0	8.8
21st	0	0	7.0	0	0	0.0	0	0.2	0	9.0	0	34.2
22nd	0	0	7.2	0	0	0.4	0	0	0	0	1.0	3.0
23rd	0	0	4.2	0	0	0.2	0	0	0	0	0	0.0
24th	0	0.4	0.2	0	0	0	0	4.4	0	0	0	0.2
25th	0	5.2	1.0	0	0	0	0	0.2	0	0	0	0
26th	0	41.0	4.0	0	0	0	0	0.4	3.0	0	0	0
27th	0	4.8	0	0.4	0	0.2	0	1.0	0.2	0	0	0
28th	0	0	0	5.0	0	2.4	0	0	0	0	12.0	0
29th	0	0	0	0.4	0	7.0	0.2	0	0	0	32.0	0
30th	0	0	0	4.4	8.0	0	0	0	0	0	2.0	0
31st	0	0	0	0	1.2	0	0	0	0	0	0	0
Highest Daily	0.2	41.0	7.0	5.0	8.0	23.0	4.0	4.4	07.0	50.0	32.0	34.2
Monthly Total	12.0	51.4	40.0	11.0	11.4	71.2	5.0	8.6	04.4	185.0	72.8	114.8

Annual total for 2018 = 079.0 mm

[View all monthly data](#)

[Plot year of daily data](#)

Summary statistics for all years

Move mouse over highest daily rainfall to view dates.

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean	91.9	101.0	100.5	83.0	63.5	80.7	43.1	49.5	43.9	60.9	76.4	68.5
Median	74.6	75.0	78.6	57.5	51.4	55.4	31.2	24.4	34.8	40.0	72.8	56.6
Highest Daily	154.0	176.6	121.6	158.2	132.0	171.0	116.8	243.0	103.0	107.8	95.0	83.8

[Plot statistics and this year](#)

Data within the table which are in italics represent observations which have not been fully quality controlled, a process which may take a number of months to complete. While these data may be correct, you should exercise caution in their use. For observations of daily rainfall which span





Bureau Home > Climate > Climate Data Online > Daily Rainfall > Graph

2018 rainfall

Bankstown Airport AWS

[About this page](#)

[1 year of data](#) [All years of data](#) [PDF](#)

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Station: Bankstown Airport AWS

Number: 66137

Opened: 1968

Now: Open

Lat: 33.92° S

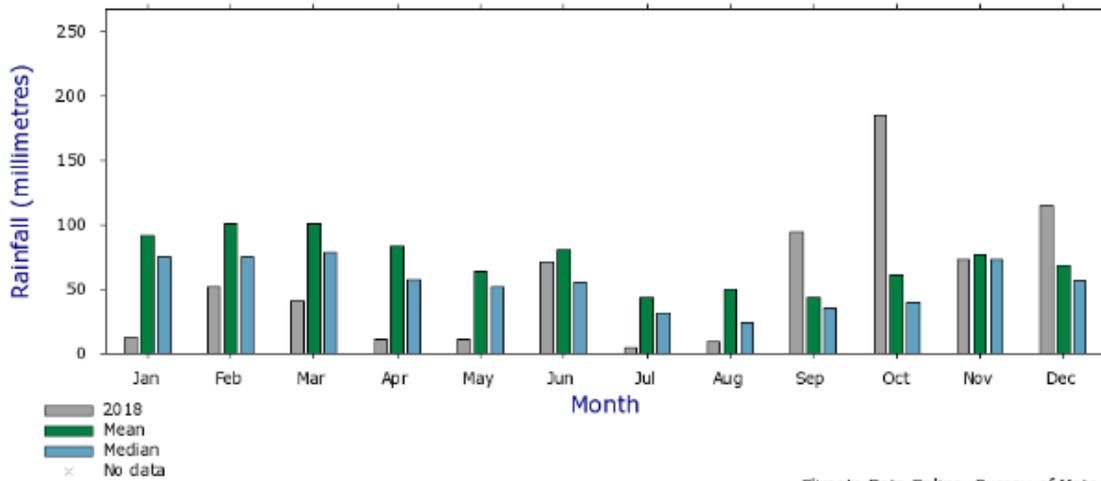
Lon: 150.99° E

Elevation: 7 m



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Bankstown Airport AWS (066137) 2018 Rainfall (millimetres)



Note: Data may not have completed quality control

Product Code: IDCJAC0009

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Biographies of authors

Dr David Reid

David is a scientist who studies waterways for his work at Georges Riverkeeper in southern Sydney. He grew up near Lake Macquarie and the beaches south of Newcastle, where he spent much time swimming, surfing, exploring the life in water and generally enjoying being close to water. After finishing school, he went to university and his studies eventually led to completion of a PhD on waterbugs and food webs in farmland streams. Gaining those qualifications has allowed him to do research and monitoring work in waterways around the world, including those in New South Wales, Victoria, South Australia, New Zealand and New York City (see https://www.researchgate.net/profile/David_Reid15). He still enjoys having fun in water too!

Antonina Fieni

Antonina loves rivers. She is often seen paddling up rivers and creeks looking for Eastern water dragons or sacred kingfishers. When not paddling, Antonina is teaching environmental science and geography at the Georges River Environmental Education Centre and at the Field Study Centre at Sydney Olympic Park. Her qualifications include a Bachelor of Education and a Graduate Diploma in Environment.

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