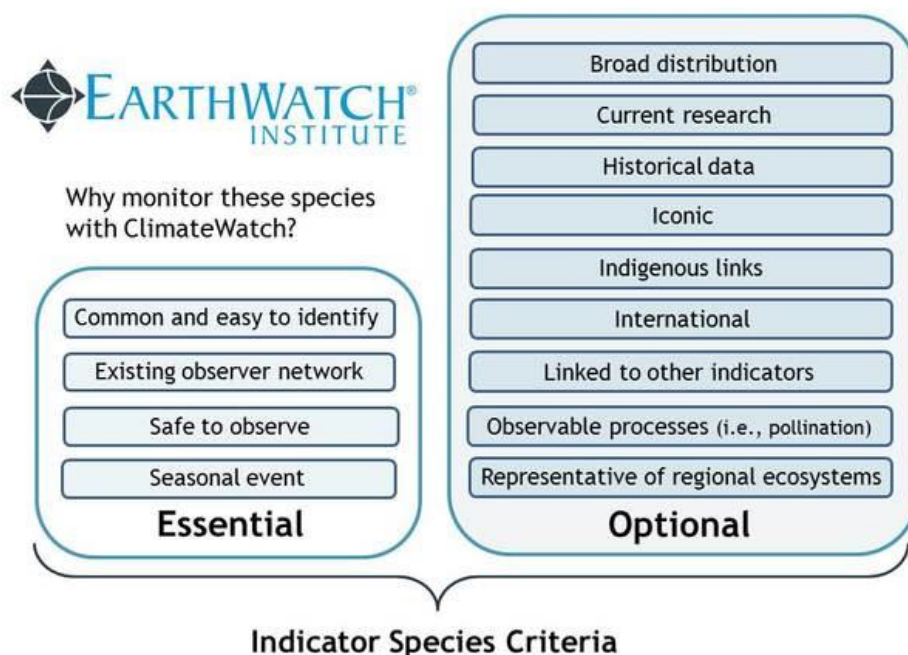**FOR EDUCATORS**

**What is ClimateWatch?**

ClimateWatch (CW) is an initiative of Earthwatch Institute that aims to build an Australian phenology network. Earthwatch Institute is an international non-profit organisation that seeks to involve volunteers in scientific research. CW seeks to engage citizen scientists (general public) to observe, record, and collect data on the seasonal events of Australian flora and fauna to understand the implications of climate change. Indicator species have been selected based on the advice of the program's Scientific Advisory Panel. CW is supported by the Commonwealth's Inspiring Australia – Science Engagement Programme, the Department of Education and Training Victoria, and the Helen Macpherson Smith Trust. All data collected contributes to the Atlas of Living Australia, a public national biodiversity database.

**What is phenology?**

*Phenology* is the study of the timing of natural events, such as first leafing, first flowering, fruit ripening, first migrant birds seen, etc. particularly in relation to climate. Phenology networks in Europe engage the public in collecting data to establish the effects of climate change on natural events. Citizen science driven phenology initiatives have proven successful in other regions (eg. Britain's Nature's Calendar phenology network and USA's National Phenology Network). When we look into the studies on biological impacts of climate change, many of these are biased to the Northern Hemisphere. CW is Australia's citizen science phenology network that aims to fill knowledge gaps for our region. CW is successful as both a data generation tool and an education mechanism.

**What are the criteria for selecting ClimateWatch indicator species?**

Indicator species were selected based on the four essential criteria and there are nine other optional criteria.



Indicator Species Criteria

## Why do we record?

Phenological records have been used by the Intergovernmental Panel on Climate Change (IPCC) to support climate change research. Unfortunately few significant datasets have been researched in Australia and ClimateWatch aims to fill this knowledge gap. Recording on the indicator species will help to build a better understanding of how Australian nature is responding to climate change. This data will be used to help inform scientists and policy-makers to develop management strategies to protect Australia's biodiversity.

## How to record?

ClimateWatch can be used by anyone, anywhere in Australia. Sightings can be recorded on the web or through the iPhone/iPad/Android app or directly on the website. Sightings can also be made along a ClimateWatch 'trail'. CW trails are a great tool for collecting repeated sightings with a class group, cross-seasonally. Species information can be found on the website, mobile app, and field guides can be downloaded from the species or trail web pages.

*For information on creating a ClimateWatch trail visit [here](here).*

## Create a ClimateWatch 'group'

Class groups can be created by the Earthwatch team where students are added to the group through account invitations. The results of each group can then be compared against each other, year after year. If a group set-up is requested, the Earthwatch team sends invitations out to the student email addresses before the start of the teaching term. Students will need to accept their invitation and will be prompted to change their password.

Individual users/students can download their sightings in a .csv file to be submitted as part of assessment under the 'download sightings'. Legacy CW data from 2009 can also be provided to teachers as an educational tool upon request.

Teachers added as 'group coordinators' will be able to see which students have recorded sightings under 'group activity report'. Students can be introduced to the app early in the teaching term and make observations in their own time.

## ClimateWatch Mobile Apps

All sightings recorded on the mobile app will sync to the user's web account. Users should sign in the mobile app using the same account login as their web account. If users have authorised Twitter or Facebook on their web account, they should use these options on the mobile app. A mobile network or wi-fi is not required to access the app*. The app has photos and information about each species, but more detailed information can be found [online](online). When recording, the app will prompt you to fill in different fields (how many?, behaviour, etc**). Make sure to click 'Submit Sighting' each time you make a sighting**.

Sightings can be edited on the website under 'My Account -> My Sightings.'

*\*Sightings made in low network coverage will indicate an asterisk and will upload automatically when the device obtain coverage again. Students can also record using a pen/paper and upload their data online by signing-in to their account. Please also take note of location (address or GPS) and time/date. The website application allows address look-up and GPS coordinate entry.*

**Additional resources:**

FREE ClimateWatch curriculum resources, mapped to the Australian Curriculum and targeted towards maths, science and geography. These lessons were developed in collaboration with non-profit organisation, Cool Australia. Free registration is required to download the teacher and student worksheets: http://www.climatewatch.org.au/for-educators

Since 2011, undergraduate biology students at UWA have used ClimateWatch to learn about plants and animals across Australia. Below is an article about its challenges and benefits, linking to the 2017 PLoS ONE paper by Dr Nicola Mitchell: https://particle.scitech.org.au/people/diy-science-boosts-wa-students-interest-in-research/

Atlas of Living Australia: www.ala.org.au

Bureau of Meteorology: www.bom.gov.au

Chambers, L.E. 2009, *Evidence of climate related shifts in Australian phenology*, UNIV WESTERN AUSTRALIA, NEDLANDS. Access directly: http://www.mssanz.org.au/modsim09/G2/chambers.pdf

ClimateWatch Youtube Guides (Earthwatch are currently in the process of updating these to suit the 2017 mobile app): http://www.climatewatch.org.au/universities

Intergovernmental Panel on Climate Change: http://www.ipcc.ch/index.htm#.UX8ezbXLpvA

USA National Phenology Network resources: http://www.usanpn.org/resources/biblio


**References**

ClimateWatch data can be cited as follows:

ClimateWatch <YEAR> <SPECIES> <START DATE> - <END DATE>
Data set accessed <DATE> http://www.climatewatch.org.au.

**Frequently Asked Questions**

**Please contact us if you are unable to find your answer below:**
climatewatch@earthwatch.org.au

**I have forgotten my password.**

*On the sign-in page, click 'reset password.'  This generates an automatic email that will have a password reset link.  Click on that link and you will be prompted to enter a new password.*

**I tried to reset my password, but I did not get a password reset email.  What now?**

*Try using a different browser and check junk mail folder.  Google Chrome works the best with our website, or check that you are running the most up-to-date version of Internet Explorer, Firefox, and Safari.*

**I'm recording as part of a university group, but I haven't received my ClimateWatch invitation.  What should I do?**

*Check your spam folder.  Check with your lecturer to see what email you have registered for your class to make sure it is correct.  If the correct email has been used, but you still have not received an invitation, then register using another email.  Contact the ClimateWatch staff directly to let us know which email address you have registered and what university you are recording with so that we can allocate you to the correct university group.*

**I'm recording as part of a University group, but it says that my invitation has expired. What should I do?**

*If your invitation has expired, please register using a different email and let your lecturer or the ClimateWatch staff know so you may be allocated to the correct group.*

**I am trying to sign in to my account, but it says that my email is invalid or does not exist.  I have also tried to reset my password, but I have not received a reset password email.**

*If you have authenticated Facebook or Twitter for ClimateWatch, this will become your new login. Your email is linked to this login and you will not be able to sign-in using your email. If you try and reset your password with your email, you will not receive a reset password email because our system prevents duplicate accounts from being created. Please login to your web account and the mobile app with Facebook or Twitter.*

**I don't have a GPS or smart phone, how do I record my location?**

*Take note of your location by writing comments about visible landmarks (streets, residences, shops, etc) or by drawing a sketch of the area. When you enter in your data on www.climatewatch.org.au, use our address locater to help you pinpoint your location. If you record at this area frequently, save it as one of your locations.*

## How often should I record?

*Record as often as you can (daily, weekly, monthly). Science often relies on precise measurements; and, identifying the exact date when a species moves into an area, washes up on the beach or increases dramatically in abundance is very important for long term data sets like ours. Regular recording also enables you to identify exactly when changes have occurred in your area, just like a personalised log book.*

## Can I record anywhere?

*Yes! ClimateWatch has 130+ species for you to record all over Australia. The next time you are out walking your dog, bushwalking, walking to uni, or strolling through a garden, see if you can spot any ClimateWatch species. If you're unsure of where to start, try a ClimateWatch trail. These trails have been created with the help of Botanic Gardens, Universities, Scouts, Friends of Gardens groups, and educators around Australia.*

## I'm in a group, should everyone submit recordings?

*Yes. Multiple entries enable scientists to ensure there is consistency amongst observations and also help to improve our sampling processes. It also helps to observe with others in case you are unsure of a sighting, your buddy can help confirm what you see.*

## What if I'm not 100% sure I have the right species?

*If you think you have the right species but are a little unsure, record it and leave a message for our scientists in the 'comments' section of the data recording page, write: "SPECIES REQUIRES CHECKING". Make sure you submit a good quality photo. If you are only 50% or less sure you have the correct species, do not record it but take several photos and send them to the ClimateWatch team on our website for verification.*

## I recorded on the wrong species, how do I delete a sighting?

You cannot delete a sighting, but you can edit it to be a relevant species. Login to your account and select 'My sightings.' Edit the sighting you want to change and change it to a relevant sighting that you made.

## I want to see the photo that I uploaded for a sighting, where can I access it?

*Go to 'My account' and select 'My sightings.' Underneath all of your sightings, click 'View all.' This brings up all sightings in chronological order, click on the timestamp link to view all recorded information and to see your photo.*

## Where have all my sightings gone on 'My sightings' on my iPhone/Android?

*If you delete/un-install/re-install the app on your iPhone, your sightings list will be cleared. This will not affect your sightings on the website. We suggest un-installing and re-installing the app to help clear the data on your phone. On Androids, if you hold the ClimateWatch icon, you are given two options: Un-install or App Info. If you drag the icon to 'App info,' you can clear the cache to remove sightings and clear space on your phone.*

## I'm in a low-reception area, will my sightings still be uploaded?

*The app will automatically cache any sightings you make and will upload them to the database when you regain reception. If you check your sightings list on your smartphone, it*

will have an asterisk (*) when it has not been uploaded.  This asterisk (*) disappears and your sighting will say 'Uploaded: Yes' when it is correctly synced to your web account.  Make sure to check your web account frequently to ensure all sightings are syncing. If they aren't, contact the ClimateWatch staff immediately.

**I'm done recording in the field, now what?**

*Once you are done recording in the field, you should always enter your data online, www.climatewatch.org.au. If you are using an iPhone/Android app, all of your sightings will automatically sync to your web account. Check your account online if you want to edit your sightings.*

**What happens to my recordings?**

*All of your sightings will go into our database.  Every sightings is then verified manually by the Earthwatch team and ClimateWatch Scientific Advisory Panel. This validated information will be made publicly available on the Atlas of Living Australia (www.ala.org.au) and can be downloaded for free. The data will be used by researchers and policy makers to help Australia build our understanding of climate change and biological systems so we can better manage and conserve our environment.*

*The ClimateWatch program receives approximately aims to validate records on a quarterly basis. If you'd like to help us with this process, please get in touch!*



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