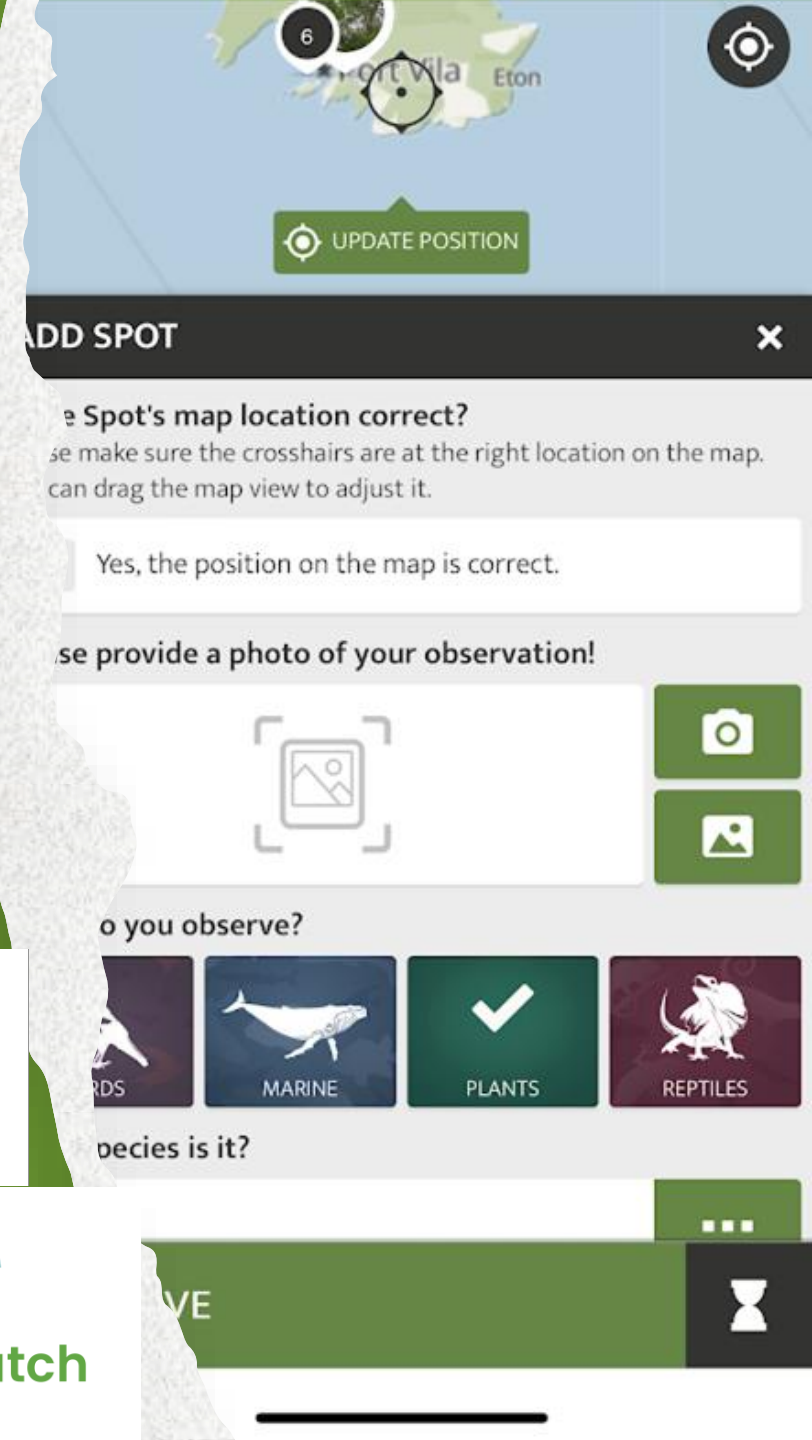
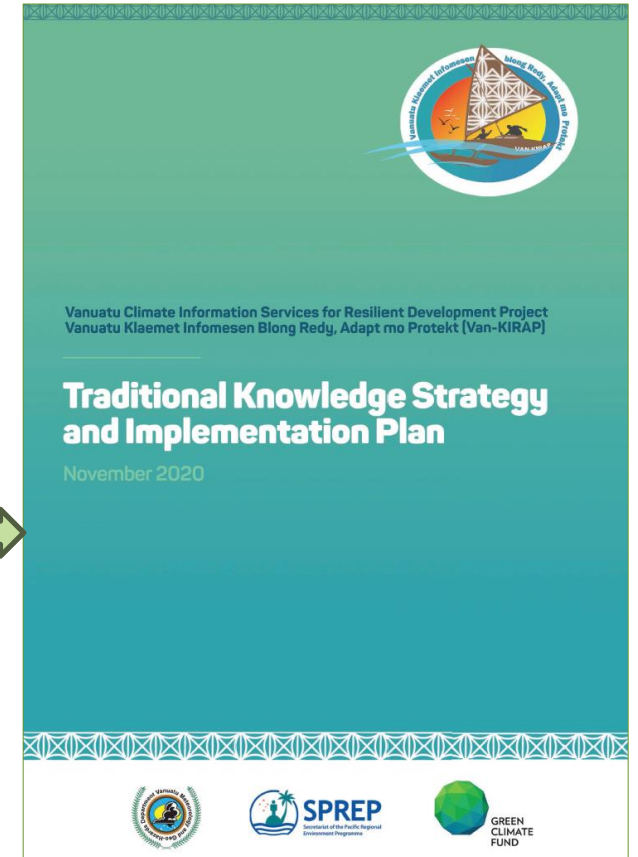
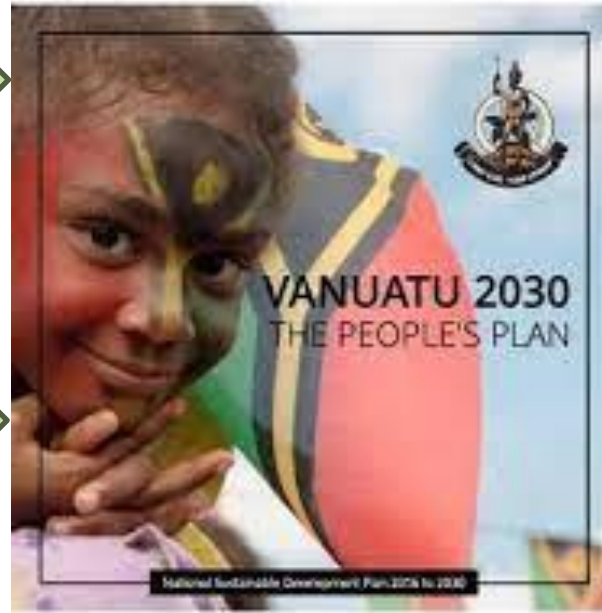
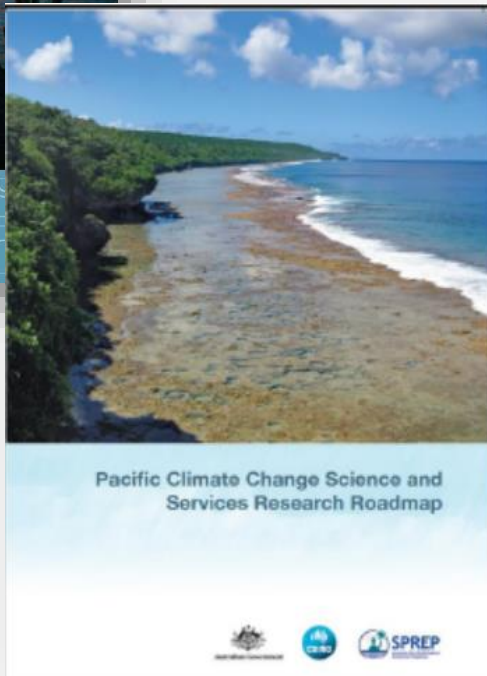
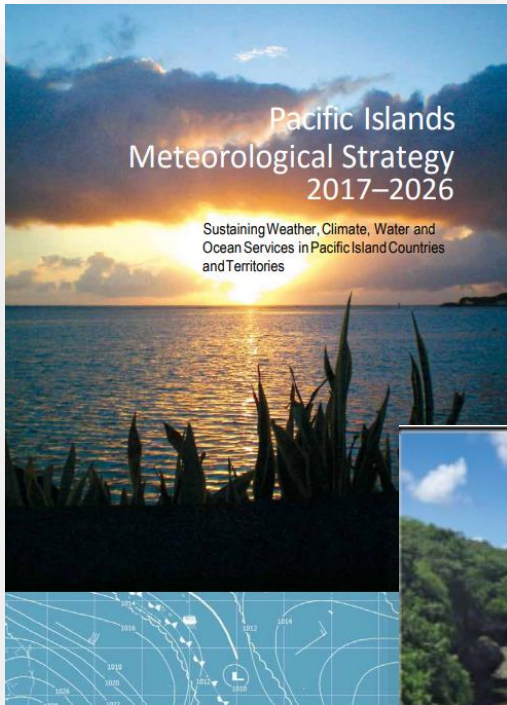


Climate Watch App Vanuatu



Traditional Knowledge in Vanuatu

Relevant Regional and National Frameworks, Policies and Strategies



TK for Weather and Climate in Vanuatu National Development over time



Van-KIRAP Project

COSPPac Project



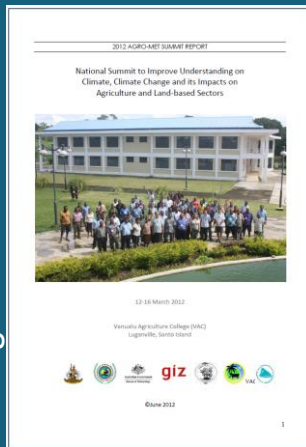
Phase 1

Phase 2

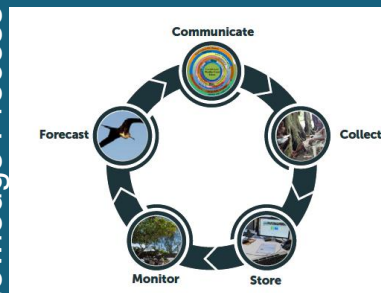
Phase 3



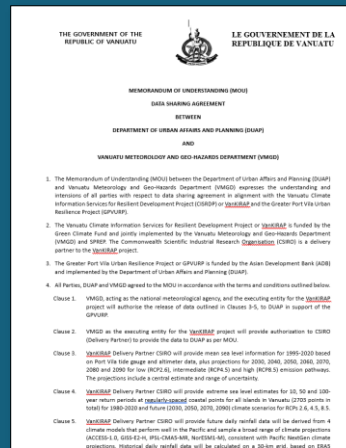
2012 Agromet Summit – Pre-COSPPAC



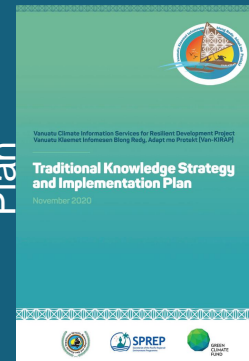
TK Knowledge Process



TK Partner Agreements, VMGD, Vanuatu Kuiturol Senta



TK Strategy and Implementation Plan



TK National Indicator Booklet

| English Name(s) | Scientific Name | Bikama / Local Name |
|---|--|--|
| Banana Tree | Musa sapientum | see CW Field Guide for other local names |
| Banyan Tree, Giant Banyan, Giant Fig Tree | Ficus religiosa | Nakama Tree, see CW Field Guide for other local names |
| Red Sapwood Tree | Pterocarpus indicus | Buata |
| Breadfruit Tree | Artocarpus altilis | Breadfruit, Nape-taj (Santo), see CW Field Guide for other local names |
| Beach Hibiscus, Coast Cottonwood | Hibiscus tiliaceus | Bulja Tree, see CW Field Guide for other local names |
| Grass | Z | Namuloto (Ganto) |
| Kava plant | Piperaceae sp. | Kava |
| Lemon Tree | Citrus limon or Citrus aurifolia? | Z |
| Mandarin Tree, Mandarin Orange | Citrus reticulata | Z |
| Mango Tree | Mangifera indica | Nakamelo |
| Tall-leaf Mangrove | Avicennia speciosa | Nakamelo Tree |
| Nakamelo, Dragon Plum | Cratogeomys ulmioides | Nakamelo |
| Molay Apple | Sidaacium melanosmicum | Nakama, see CW Field Guide for other local names |
| Sago | Cycas revoluta | Nakamelo (Epi) |
| Yakima Chestnut, Polygala Chestnut | Albizia leonardus | Nakamelo Tree |
| Pacific Lychee | Dimocarpus pinnata | Nandag, see CW Field Guide for other local names |
| Nakal Nak, Galla Nut, Casuarina Nut | Casuarina indica | Nandag (Santo) |
| Indian Coral Tree | Erythrina papuana | Narara (Epi) |
| Sidaac | Barringtonia edulis | Navek Tree |
| Nandag | Saccharum edule | Nandag (Epi) |
| Clusia Tree, Sweet Orange plant | Clusia sphenoloba | Nandag (Santo), see CW Field Guide for other local names |
| Ribe plant | Clusia papuana? | Z |
| Wild Cane | Mitrosiphon sp. or Mitrosiphon spicata | see CW Field Guide for other local names |
| Yam | Dioscorea eschscholzi (Wur) Yam or D. alata (Germany crop in Tanna Island) | Z |

Climate Watch App Vanuatu





What is TK Monitoring

Traditional Knowledge Monitoring involves:

- Observing TK indicators at regular times throughout the year



Image: LE Chambers



By Crisco 1492 - Own work, CC BY-SA 3.0,
<https://commons.wikimedia.org/w/index.php?curid=18887849>



Traditional Knowledge Monitoring

Currently:

- Use paper-based forms to monitor TK indicators
- Used for TK climate forecasting/verification
- Used to see how species respond to climate

Issues:

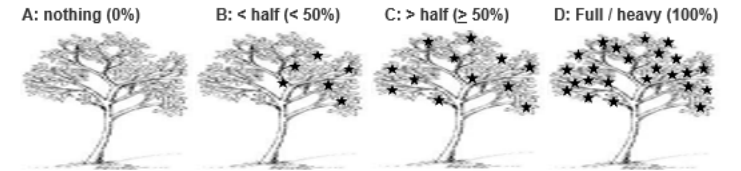
- Only a small number of individuals involved
- Postage costs
- Return time delays

Solution:

- ClimateWatch Vanuatu

Part 2: PLANTS (P) – FRUITING AND FLOWERING (P 1 to P 6)

Please complete the following table using the codes in the diagram below that best matches what you have seen during the past week. You can add other plants you have seen in the empty rows. For example if the whole of Nakavika has flowers but only a small number of fruit record D under "Flowering" and B under "Fruiting". If the mangroves have no flowers or fruit record A under both "Flowering" and "Fruiting". The star symbol ★ below is used to indicate the level of FLOWERING and / or FRUITING Note: if you see more than one tree of each species (e.g., four mangrove trees) in the same place or different places during the week then please score each tree separately (e.g., Tree 1, Tree 2, Tree 3 and Tree 4).



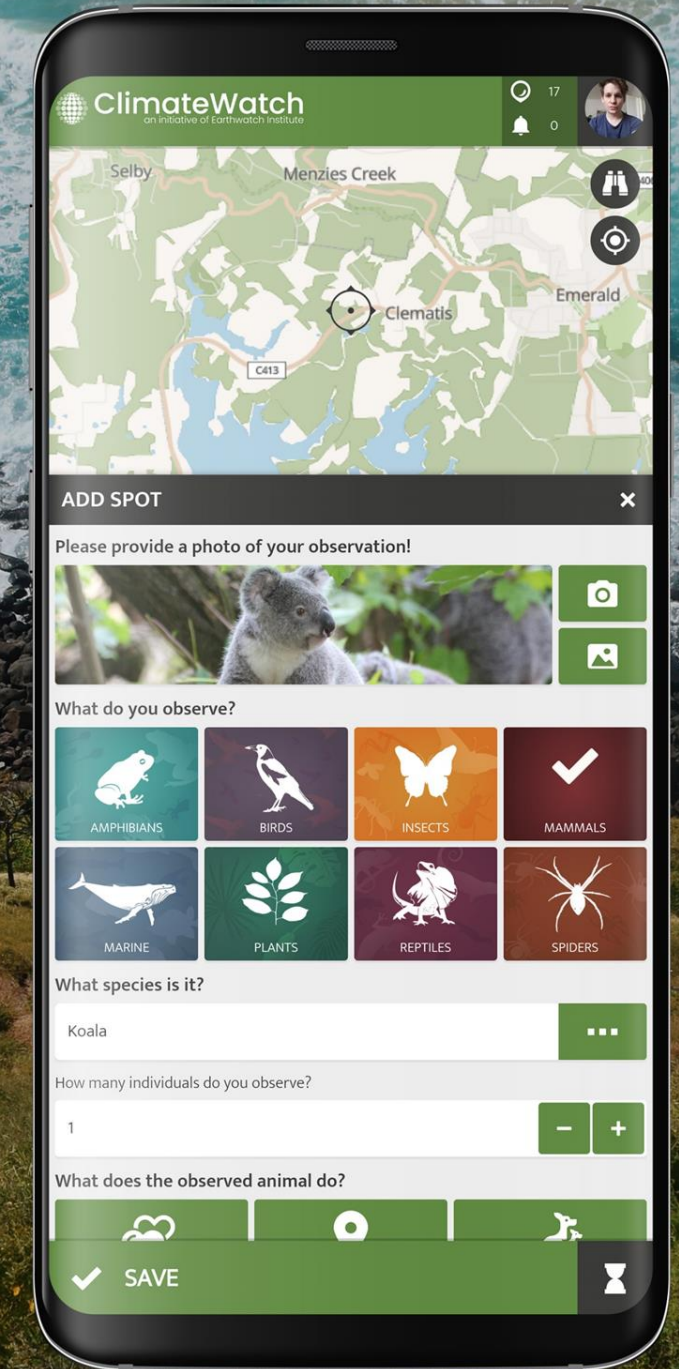
| Plant | Flowering (Fl) | Fruiting (Fr) | Circle how much more or less fruiting (Fr) and flowering (Fl) | | | | | |
|----------------------------|-------------------------------|-------------------------------|---|------------------------|-------------------|-----------------|-------------------|------------------------|
| | | | Amount: | Much lighter (Fl / Fr) | Lighter (Fl / Fr) | Usual (Fl / Fr) | Heavier (Fl / Fr) | Much heavier (Fl / Fr) |
| P1. <u>Nakavika</u> | A B C D | A B C D | Amount: | Much lighter (Fl / Fr) | Lighter (Fl / Fr) | Usual (Fl / Fr) | Heavier (Fl / Fr) | Much heavier (Fl / Fr) |
| | Tree 1: Tree 2: Tree 3: | Tree 1: Tree 2: Tree 3: | Timing: | Much earlier (Fl / Fr) | Earlier (Fl / Fr) | Usual (Fl / Fr) | Later (Fl / Fr) | Much later (Fl / Fr) |
| P2. <u>Mangrove tree</u> | A B C D | A B C D | Amount: | Much lighter (Fl / Fr) | Lighter (Fl / Fr) | Usual (Fl / Fr) | Heavier (Fl / Fr) | Much heavier (Fl / Fr) |
| | Tree 1: Tree 2: Tree 3: | Tree 1: Tree 2: Tree 3: | Timing: | Much earlier (Fl / Fr) | Earlier (Fl / Fr) | Usual (Fl / Fr) | Later (Fl / Fr) | Much later (Fl / Fr) |
| P3. <u>Breadfruit tree</u> | A B C D | A B C D | Amount: | Much lighter (Fl / Fr) | Lighter (Fl / Fr) | Usual (Fl / Fr) | Heavier (Fl / Fr) | Much heavier (Fl / Fr) |
| | Tree 1: | Tree 1: | | | | | | |



What is ClimateWatch?

ClimateWatch:

- App first released in 2009 (Australia)
- Citizen Science observations of plants and animals
- First continental phenology project in the Southern Hemisphere (tracks changes in the timing of periodic plant and animal life cycle events and how these are influenced by seasonal and interannual variations in climate)

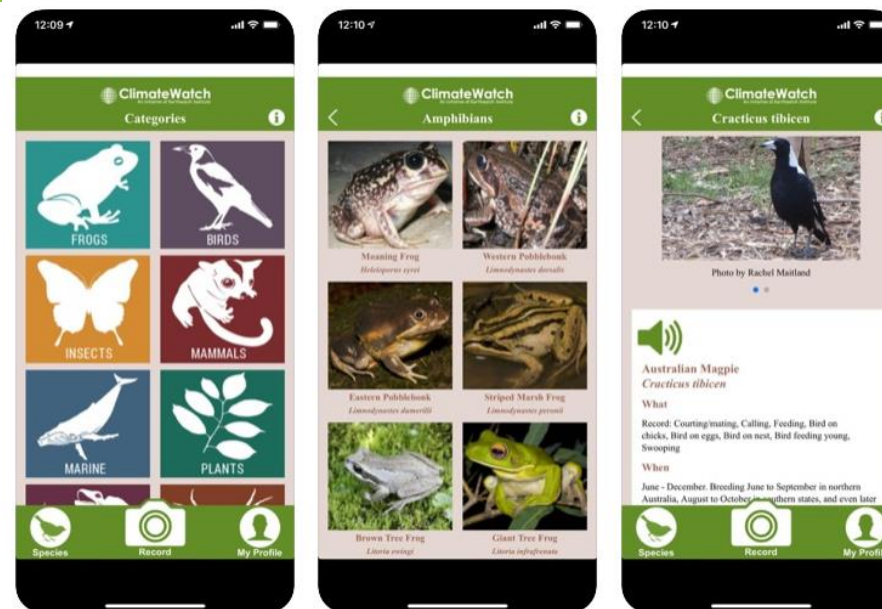




About ClimateWatch

ClimateWatch Australia

- Initial concept in 2006
- Established in 2009
- 218 indicator species:
- Amphibians, Birds, Insects, Mammals, Marine, Plants, Reptiles, Spiders





Australian Statistics

Impact Pathways

1

Mass data sets



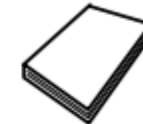
28,000 users



218 species



93,000+ validated



220+ publications



150K+ observations

2

Education Climate Change & Nature



2018

Lesson plans are launched by Cool Australia and ClimateWatch



100+

Number of teachers who have participated in ClimateWatch PD training



>7,500

Number of times ClimateWatch lesson plans have been downloaded



>3000

Number of teachers estimated to have utilized ClimateWatch lesson plans



>140,000

Students estimated to have engaged with CitSci and ClimateWatch via lesson plans

3

Valuable data for decision making



141

Species Distribution Maps published

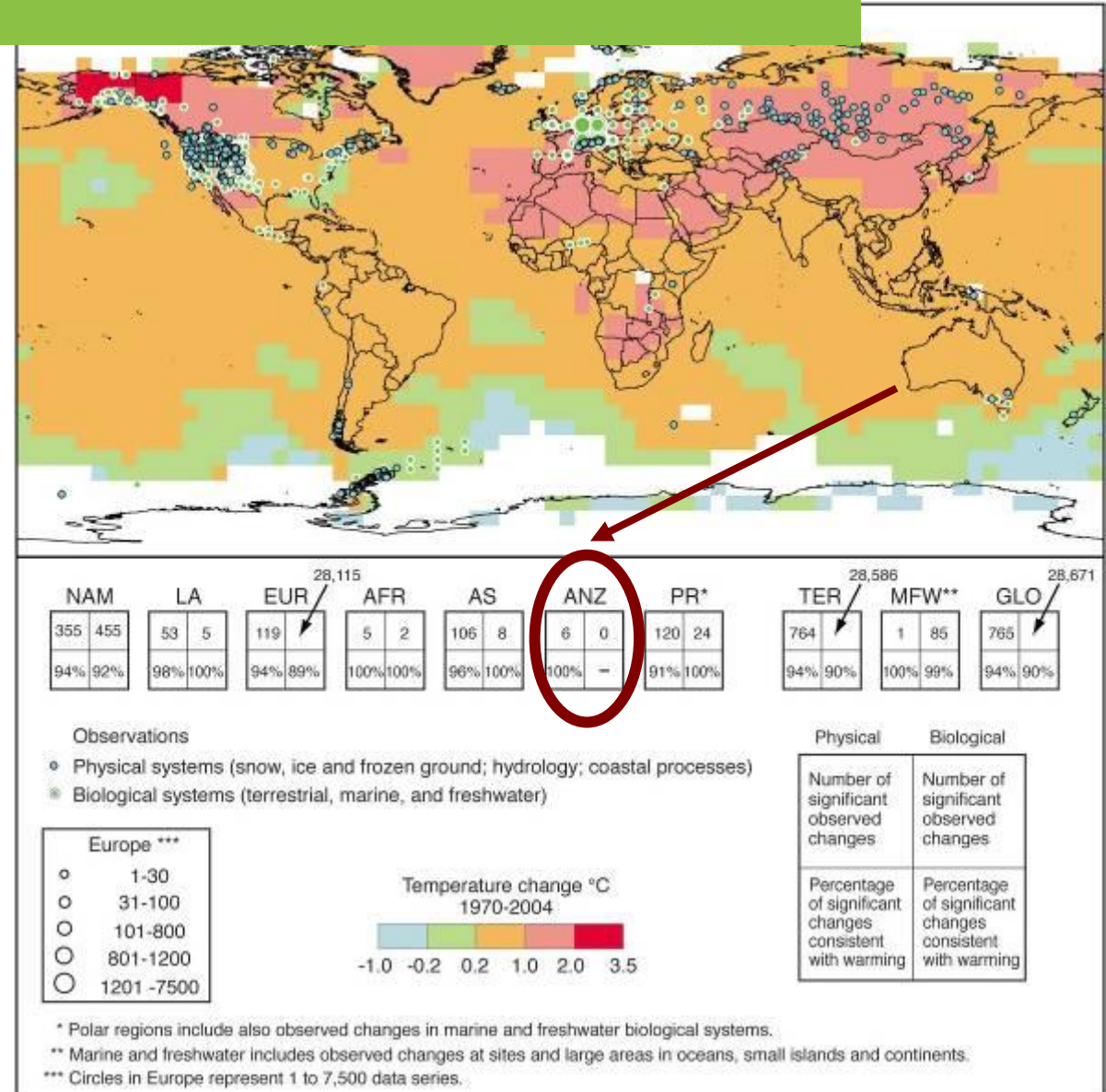


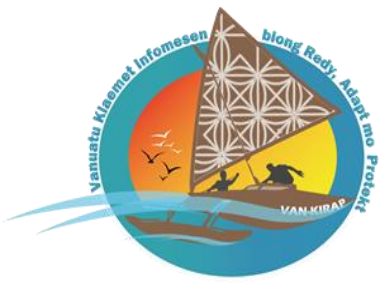


Why was it developed?

IPCC 4AR (2007)

- Knowledge of how species interacts with climate had strong Northern Hemisphere bias
- Almost no studies in Southern Hemisphere or the Tropics
- Role for the public to assist in understanding /data collection
- Partnership between Earthwatch Australia, Bureau of Meteorology & University of Melbourne

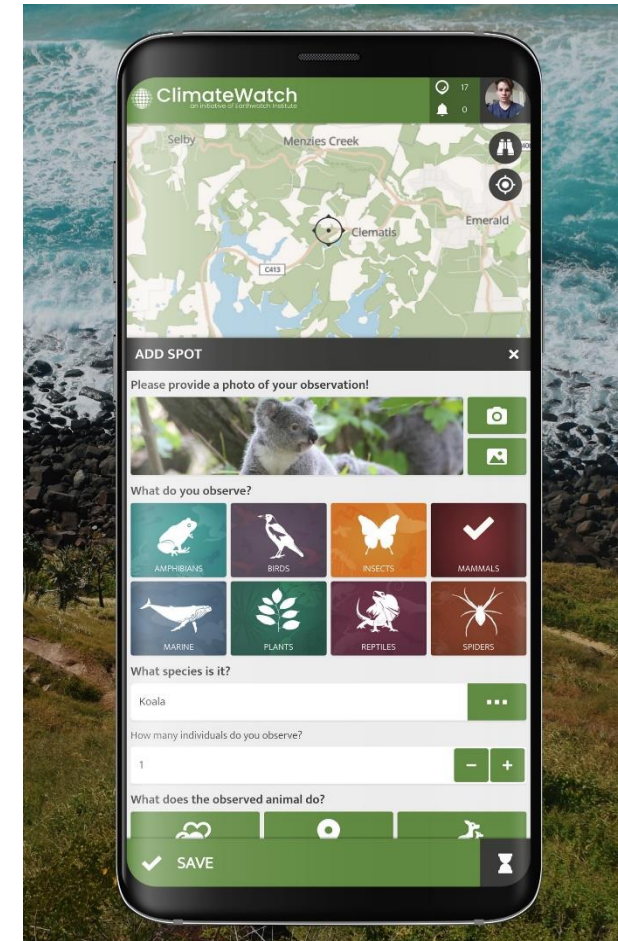




Climate Watch App Vanuatu



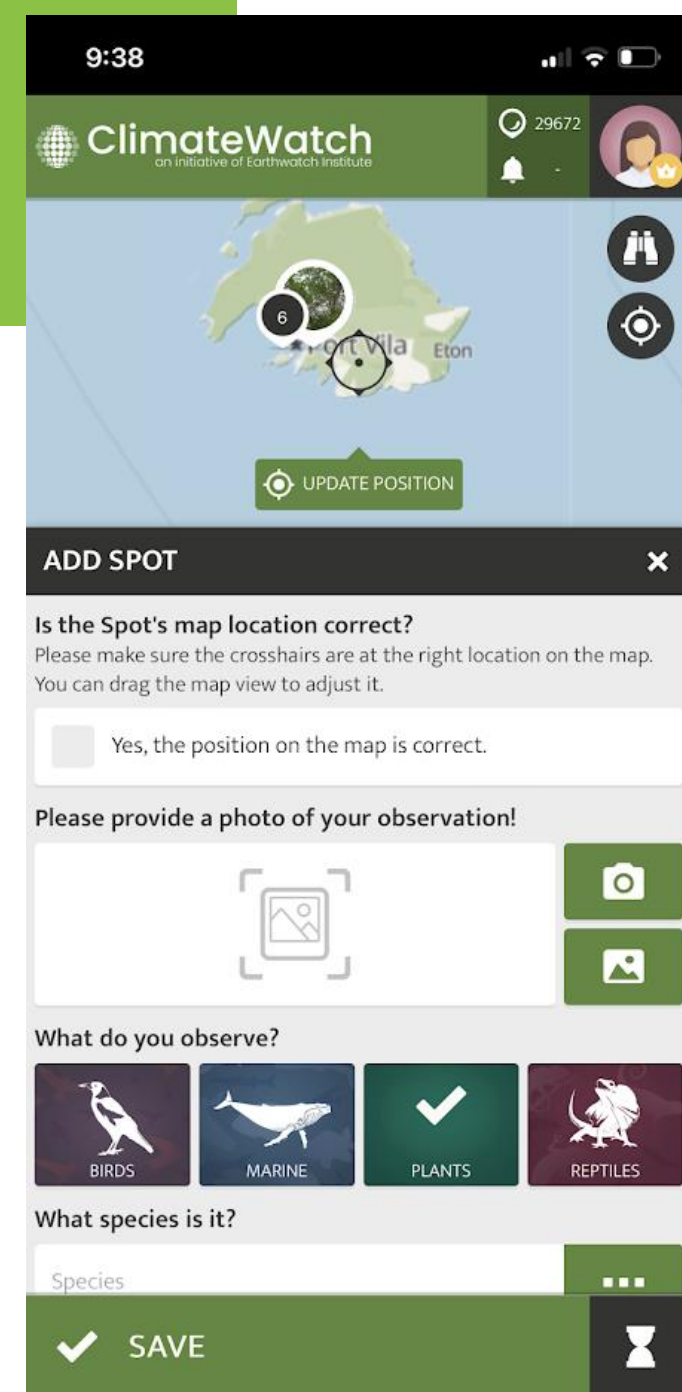
- Mobile app for Monitoring
- Free at App Store and on Google Play
- Record whenever you like
- Anyone can make observations

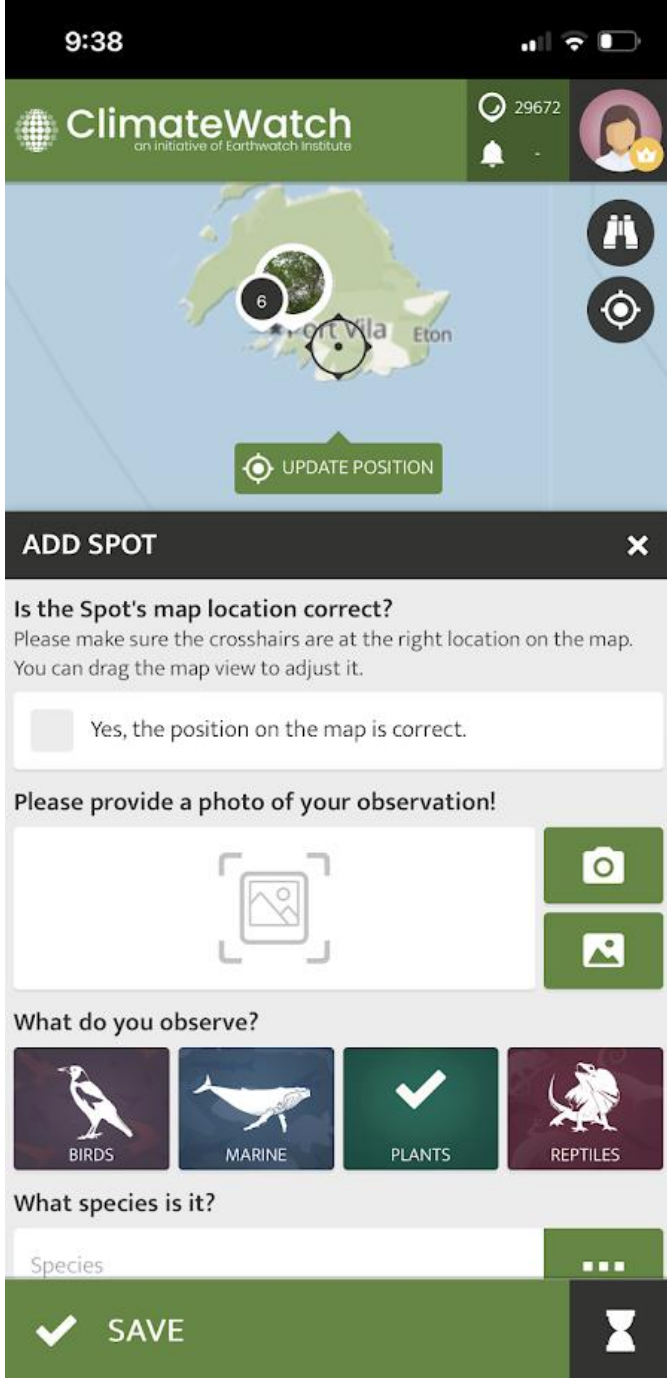




ClimateWatch App Vanuatu

- Available for use by Citizen Scientists (331K cellular mobile users, 219K internet users in Vanuatu: Digital 2023 Vanuatu report)
- 20 indicator species
- Offline functionality (obs. stored when out of reception)
- Uploaded images used to verify observations
- Species i.d. and field guides available
- Interactive location map
- Social interactions – user profile, leader board, awards, etc.
- Direct messaging to users for updates, events, etc.
- CW Trails can be displayed on interactive map
- Regional administrators



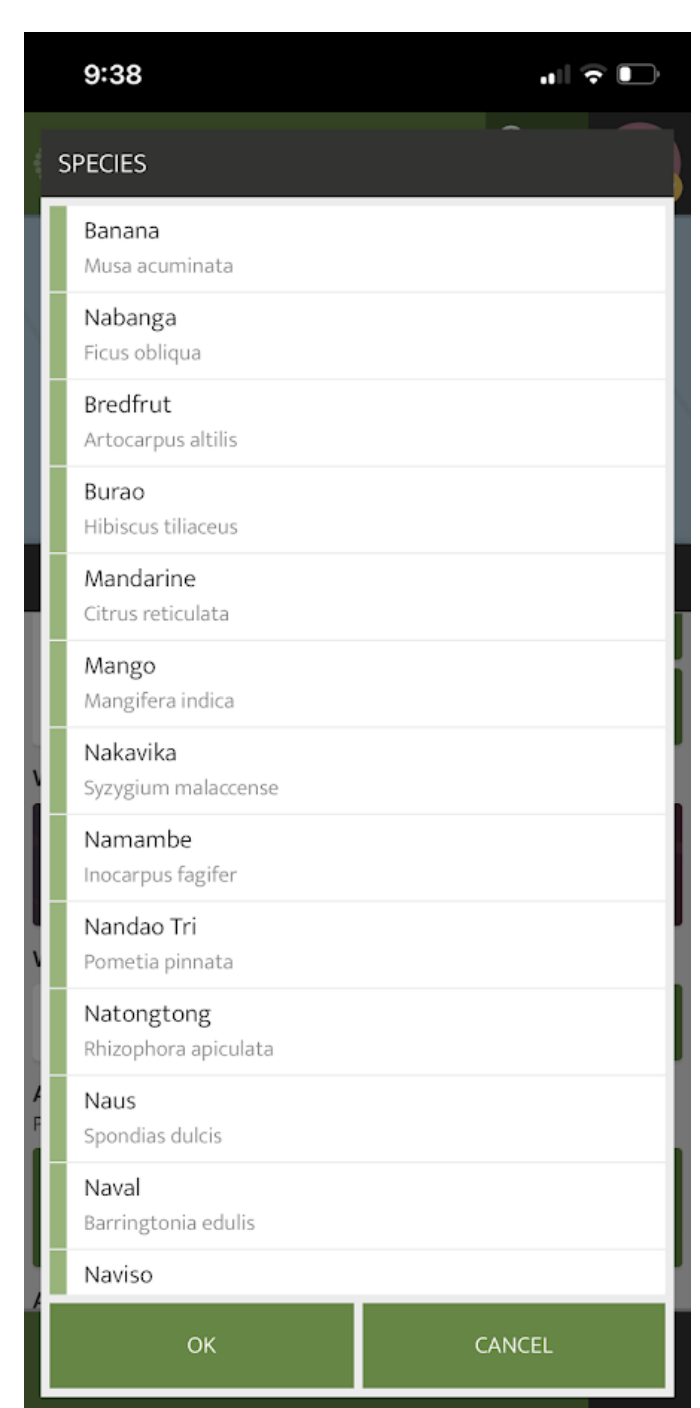


ClimateWatch Vanuatu

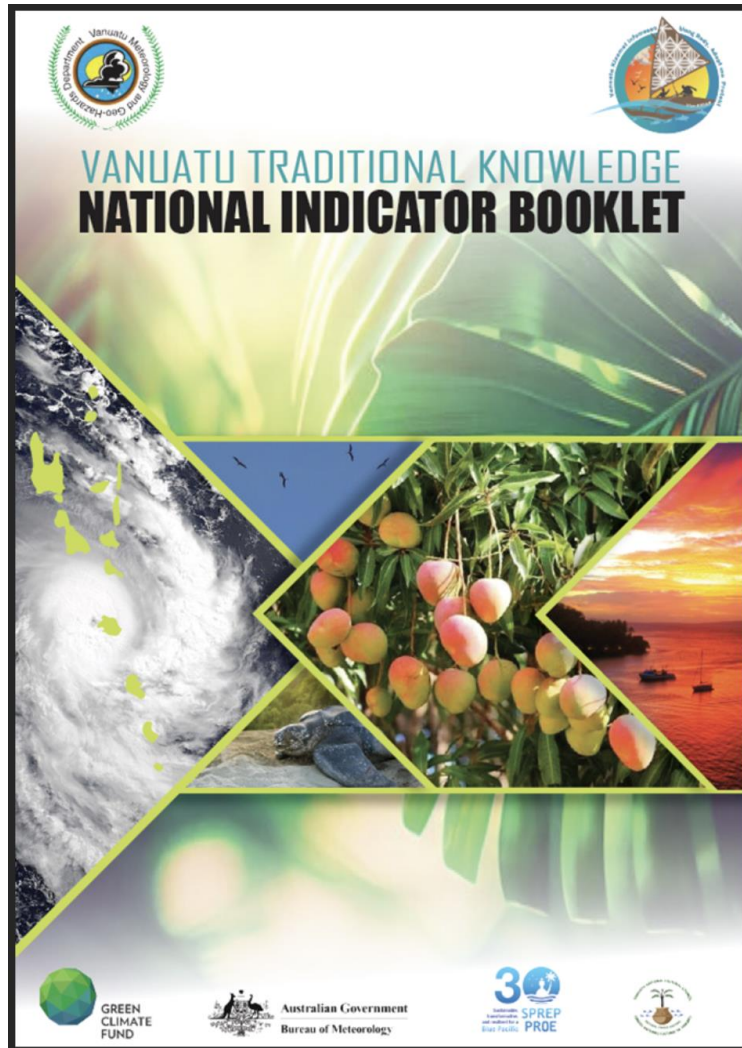
Easy to Use:

- Record location
- Add Photo (using camera or from saved image on phone/computer)
- Select Type of Observation
- Select Species
- How many were seen?
- What were they doing?

Bislama and English version

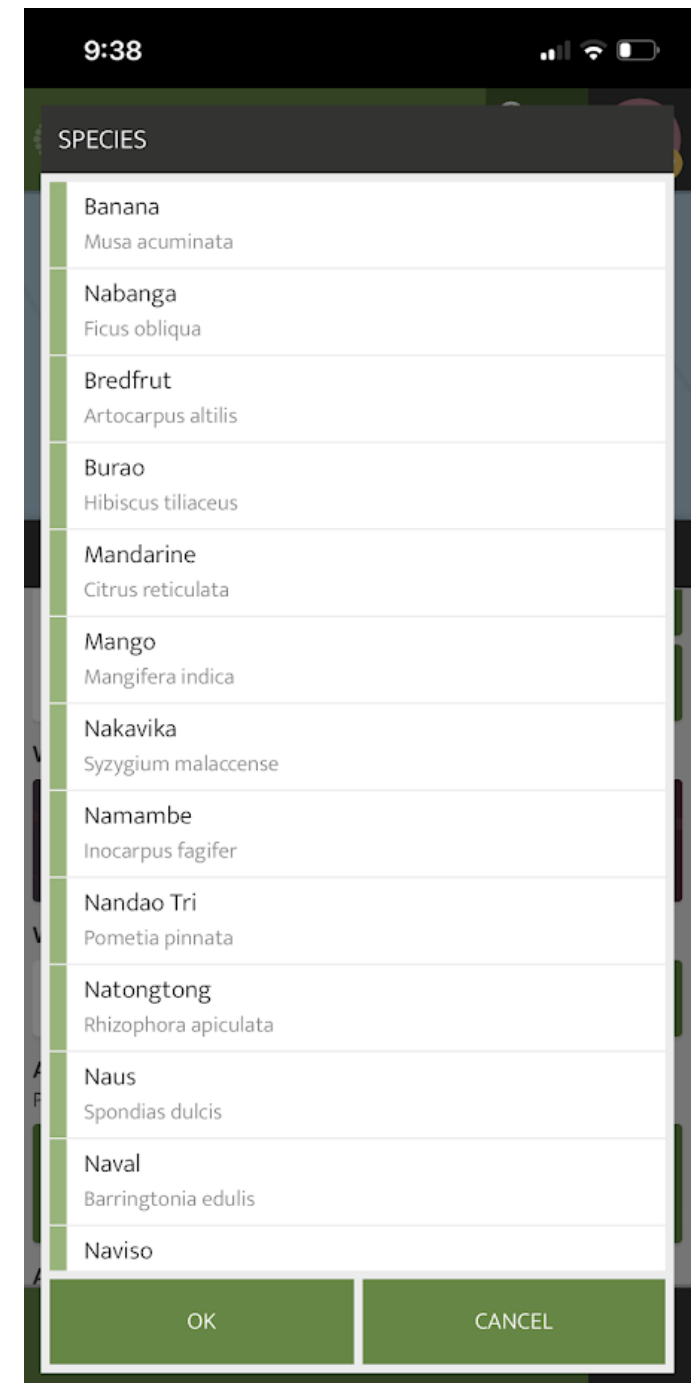


ClimateWatch Vanuatu



Traditional knowledge:

- When the turtle nesting area is very inland it is a sign that cyclone season is approaching.
- If the turtle moves inland, it is indicating that a tropical cyclone is approaching (Ngunu).
- When the turtles come shore to tabu areas inside the forest that means a big cyclone will strike the island in the next 2-3 weeks (Tanna)
- Turtle shows a lot of signs of a coming cyclone, and one of them is when the turtle comes ashore to lay its eggs in the sand, that shows that the indicator knows very well that the cyclone will be disturbing her eggs and for this reason she has to put her eggs in the sand. But if she does her nesting up in the bush that shows there will be a very strong cyclone and the sea will be rougher, for that reason she has to go up higher (Tanna)





ClimateWatch Activities



Species guides



Plants Firewheel Tree

Its genus name *Stenocarpus* means narrow fruit, referring to its seed pods; and its species name *sinuatus* means wavy, referring to the edges of the leaves.

Evergreen tree, up to 33 m high, but much smaller when grown in gardens where it reaches a height of only about 10 m with a width of 5 m.

Leaves

Dark glossy green and paler underneath, they can be oval-shaped, lobed or have wavy edges. They are usually 15 – 25 cm long (but can be up to 45 cm long) and 2 – 5 cm wide, and are generally smaller on exposed branches. There is one distinct vein running down the centre of each leaf.

Flowers

Bright red with a yellow tip, and 2.5 – 4 cm long. They cluster in a wheel-like arrangement at the end of a stalk. The cluster can be up to 10 cm in diameter and consists of 6–20 flowers.

Fruits/Seeds

A grey-brown seed pod which is 5 – 10 cm long and has short hairs. The seeds inside are 2.5 – 3.5 cm long.

Field Guide

Improve your identification skills. Download your Firewheel Tree Field guide [here!](#)

Did You Know?

- The shape of its leaves are quite variable, like many species from the Proteaceae family of plants
- When grown from seed, it can take seven years or more to flower, but a cutting from a mature plant will usually flower within 2–4 years



What to Observe

- First fully open single flower
- Full flowering (record all days)
- End of flowering (when 95% of the flowers have faded)
- Open seed pods (record all days)



When and Where When To Look

- From December through to June
- Flowers appear in summer through to early winter (some odd flowers may appear at other times after high rainfall and humidity)
- Seed pods appear after flowering

Where To Look

- From north-eastern NSW (north of the Nambucca River) to north Queensland
- Adaptable to a range of climates if given adequate water and is planted outside these regions
- In tropical or sub-tropical rainforests or open areas along the coast and inland mountain ranges, including urban areas
- Look in parks, gardens and along streets



What Else? Similar Species

Illawarra Flame Tree (*Brachychiton acerifolius*) has bell-shaped flowers that don't form a wheel-like arrangement.

Poinciana (*Delonix regia*) has feathery and fern-like leaves, larger flowers (8 – 15 cm in diameter) with five petals (each 4 – 7 cm long), and larger seed pods (20 – 70 cm long).



ClimateWatch Activities



ClimateWatch School materials

- How to use ClimateWatch in schools
- Lesson Plans (primary and secondary)
- Games & Activities



 **ClimateWatch**
AN AUSTRALIAN GOVERNMENT INITIATIVE

Module 4.

Resources Available to You

ClimateWatch Lesson Plans

- ClimateWatch have partnered with Cool Australia to develop lesson plans mapped to Australian Curricula
- Use this exciting ClimateWatch lesson plan for [Foundation to Yr 2](#)
- [Yr 7 & 8 Science](#) students can explore ClimateWatch over 6 entwined lessons
- [Yr 7 & 8 Geography and Science](#) students also have 6 lessons to engage with ClimateWatch and CitSci
- [Yr 7 & 8 Maths](#) students learn to collect, analyse and communicate ClimateWatch data
- [Yr 9 & 10 Geography](#) students dive deeper into environmental change and trails over 5 lessons

Extra Engaging Activities

- Students can engage with ClimateWatch through these [additional fun activities](#)
- Colouring Sheets & Seasonal signs
- Nature Journaling & Field Recording Sheets
- Bingo, Memory Snap & Scavenger Hunt

Explore Module 4 in greater depth [here](#).





ClimateWatch Activities



ClimateWatch Vanuatu trails – to be developed in partnership with VMGD and DEPC

ClimateWatch – Manningham

PHENOLOGY TRAIL POCKET GUIDE

Currawong Bush Park

Sweet Bursaria (Blackthorn)
Bursaria spinosa subsp. spinosa

1 2
4 6

5-10m in height

WHEN Flowering from December to February.
Fruiting from June to July.

WHERE Open Eucalypt woodlands from coastal to alpine regions.



ClimateWatch Vanuatu



Free to download app (any iOS or Android device):

Android:

- <https://play.google.com/store/apps/details?id=com.spotteron.climatewatch&pli=1>

iOS:

- <https://apps.apple.com/us/app/climatewatch-spotteron/id1552422143>

WebApp for the browser:

- <https://www.spotteron.com/climatewatch/form/add/0>



ClimateWatch Vanuatu delivery



Target Groups:

- Van-KIRAP's Community Climate Centres
- Women's Weather Watchers
- Volunteer Rainfall Network
- Wan Smol Bag Turtle Monitors Network
- Schools and Universities

Selected Outputs:

- Educational materials, including lesson plans
- ClimateWatch trails (villages/schools)
- Data used in climate variability and change awareness products
- Data used in climate outlooks (TK forecasts)



Citizen Science

Citizen Science

- “Scientific research conducted with participation from the public”
- Help to educate and engage members of the public through hands-on involvement

ClimateWatch is an example of a citizen science project (as is the VRN)



Why do we need Citizen Science?

Some of the reasons include:

- More meaningful engagement with the community
- Increased resources/man-power
- Possible to collect larger volumes of data more quickly (and more cost effective)
- Members of the public often understand their location better than outsiders



How Does Citizen Science Apply to Van-KIRAP?

Focus on Culture, Climate and Biodiversity in Vanuatu

- Traditional Climate and Forecasting knowledge and effectiveness
- Impacts of climate change on species

(especially as it relates to agriculture, forestry, fisheries, and conservation)



Australian Government
Bureau of Meteorology



Tankgio tumas!

