Climate Systems

National Environmental Science Program

Climate Almanac User Experience Report

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Contents

Engagement overview

This document is a summary of the strategic design activities undertaken for the NESP Hub CS3.2 Gateway project between October 2023 and January 2025.

The author Mitch Harris (UX Principal from the CSIRO Climate Intelligence Group) joined the project in October 2023 at 0.4 FTE capacity, to assist the NESP Climate Systems Hub CS3.2 project team in developing a new climate portal, specifically targeted at low climate literacy users, which was identified as an existing knowledge gap.

Implementation plan

An implementation plan was developed for the NESP Hub Gateway, that outlined a UX user centred design approach incorporating multiple user validation touchpoints to drive evidence-based project decision-making, and support preparation for full development of the Gateway or Climate Almanac portal (subject to funding) in 2025.

Project resources and constraints
As captured during the Strategy Workshop (see below), a number of initial project inputs and constraints were identified, including;

1. Existing research – foundational user feedback had already been collected by NESP hub team members, which the project team decided to leverage rather than undertake new UX research.
2. Timing – Given the project completion deadline (December 2024), utilisation of existing user needs evidence was necessary to keep scheduling, rather than additional research being undertaken to validate existing findings. To counter any risk of inaccurate assumptions, early validation of user needs was factored into the concept testing to ensure applicability of use cases developed.
3. Budget – limited project funding existed for designer and developer role contributions, so the project directors decided to combine funding for a more detailed and extended design phase.
4. Knowledge Broker team – NESP hub knowledge broker team involvement would need to be relied upon for co-developing the solution approach despite their limited project allocations.

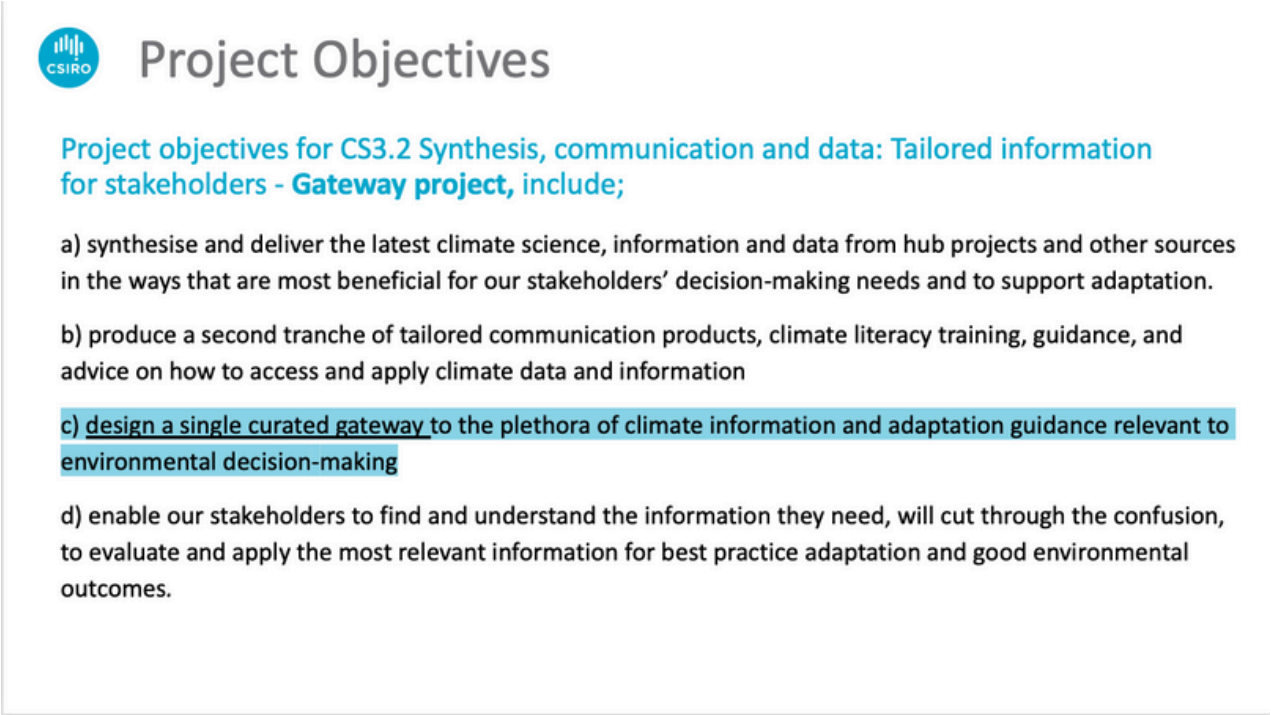
UX activities and key dates

Activity	Details	Date
Project documentation review	Review of existing project documentation upon project engagement	October 2023
UX research plan	A UX research plan was developed to communicate to indicative activities involved in the design of a Gateway application	October 2023
Audit of existing NESP research	Desktop review of existing synthesized NESP hub audience research and raw data that contributed to the rationale behind the Gateway project	October 2023
Horizon scan of climate portals	Review of 18 National and International climate portals to assist the development of differentiated Gateway strategy and value offering	November 2023
Research findings	Development of high-level research findings with the NESP hub project team (PowerPoint presentation)	November 2023
Strategy workshops	A series of strategic design workshops were facilitated with NESP hub Gateway project team and knowledge brokers to consider various ways of solving the project objectives The two workshops focused on the ideation of content strategy, Gateway market positioning and MVP feature requirements for NESP hub Alf and Bob personas	November 2023 - January 2024
Implementation plan	Development of a proposed implementation plan for Gateway MVP design activities	December 2023

Activity	Details	Date
Use case development	Eight prioritised use cases were developed in collaboration with the NESP hub knowledge broker team, that became foundational to the future direction the Climate Almanac	March - April 2024
Features / functionality	Minimum Viable Proposition (MVP) focused Gateway features were identified to support the content strategy and key use cases within the project schedule envelope	April - May 2024
Information architecture (IA)	Site specific information architecture was developed based on the identified use cases, content strategy and features requirements	May - July 2024
Wireframe development	Low-fidelity wireframes were produced to test with end Queensland Park and Wildlife Services (QPWS) users and elicit feedback for final design and content planning	August - September 2024
Stakeholder engagement	Validation of the Gateway approach was conducted with representative Queensland Park and Wildlife Services (QPWS) end user to ensure good alignment with user needs	October 2024
Synthesis of user feedback	Analysis of the user feedback was undertaken which formed a key input for the climate science and UX/UI solution development	October 2024
Content development	Gateway science and guidance was developed to support the QPWS fire management use cases	November - December 2024
UI concept designs	High fidelity concept designs were be developed to showcase the Climate Almanac concept	November - December 2024
Interactive prototype	An interactive online Figma prototype was developed to share with QPWS for user feedback	January 2025
Validation survey	A survey was developed to capture key QPWS user feedback useful for future development of the Climate Almanac	January 2025

Project documentation review

Upon joining the project in October 2023, a review of existing project assets and documentation was conducted to identify the key program objectives, stakeholder requirements, resources available, intended audience and milestone information, foundational for the development of strategic design plan.



Project Objectives

Project objectives for CS3.2 Synthesis, communication and data: Tailored information for stakeholders - **Gateway project,** include;

a) synthesise and deliver the latest climate science, information and data from hub projects and other sources in the ways that are most beneficial for our stakeholders' decision-making needs and to support adaptation.

b) produce a second tranche of tailored communication products, climate literacy training, guidance, and advice on how to access and apply climate data and information

c) design a single curated gateway to the plethora of climate information and adaptation guidance relevant to environmental decision-making

d) enable our stakeholders to find and understand the information they need, will cut through the confusion, to evaluate and apply the most relevant information for best practice adaptation and good environmental outcomes.

NESP Climate Systems Hub data and information gateway

Project resources and constraints

- Landing page (with step-by-step guide?)
- Gathering of relevant information based on use case, synthesis data/graphs/maps
- Guidance on how to select and apply information
- Case studies from difference sectors and locations
- Integration with communication products and training

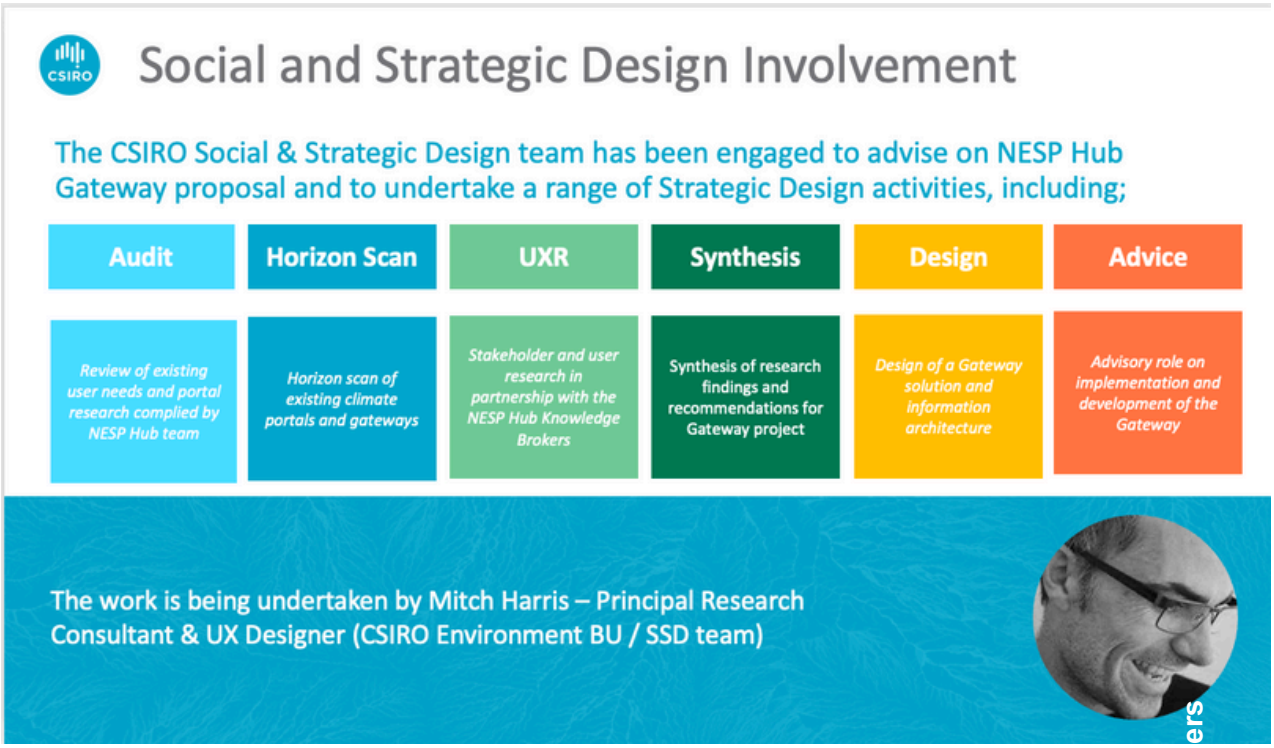
Keys to success

- Close collaboration and co-development with ACS of shared base data and capability
- Producing complementary portals that maximise efficiencies and meet diverse user needs
- Supporting portals/gateways with guidance, use cases, training
- Ongoing co-design and co-production

UX research plan

Following the project documentation review, a high-level research plan was developed and socialised with NESP project stakeholders in October 2023, to communicate the main strategic activities during the design phase of the Gateway project.

High level plan

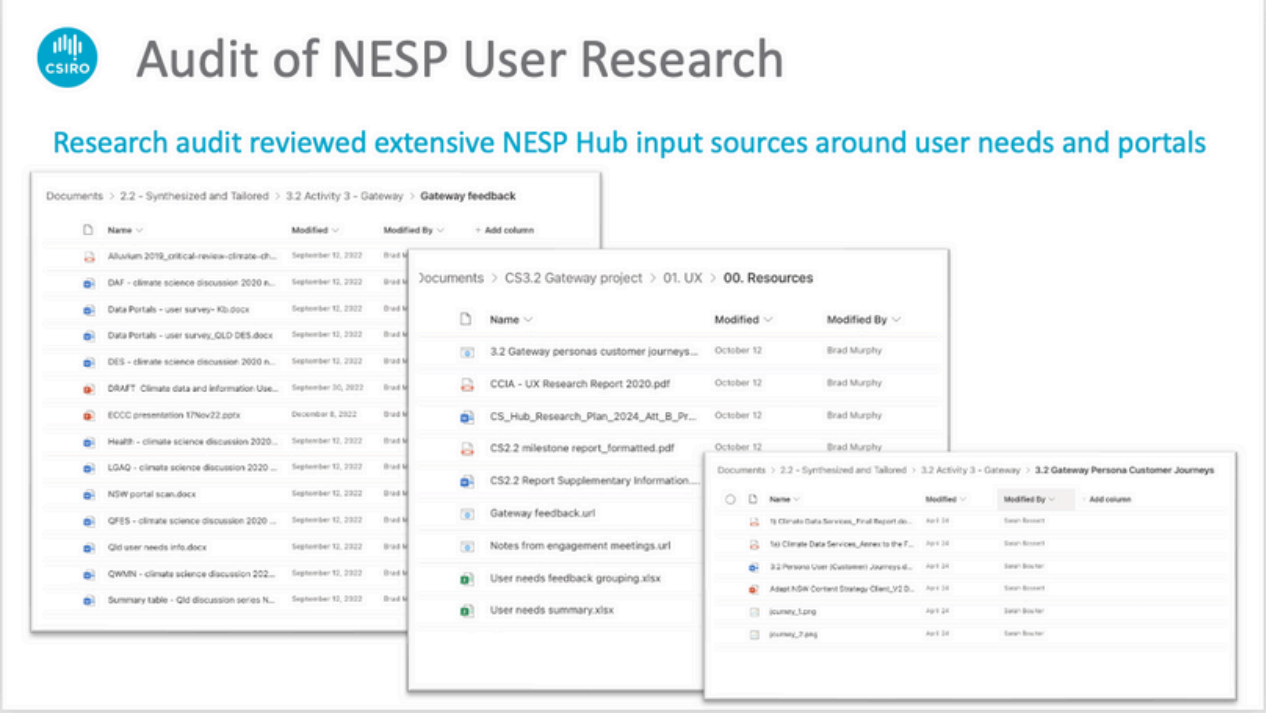


Audit of existing NESP hub research

A desktop review of NESP hub research artefacts and raw data (curated by the project leader) was conducted in October 2023. The purpose of the review was to;

- conduct an independent assessment of the NESP hub user research collected that contributed to the rationale behind the NESP hub Gateway concept
- characterise the user needs, pain points and issues identifiable within the research
- summarise the opportunities and unmet users' needs that might contribute to a Gateway solution
- establish a baseline for user needs and pain points data for future stakeholder engagements during and after Gateway development, deployment and usability testing

Research sources



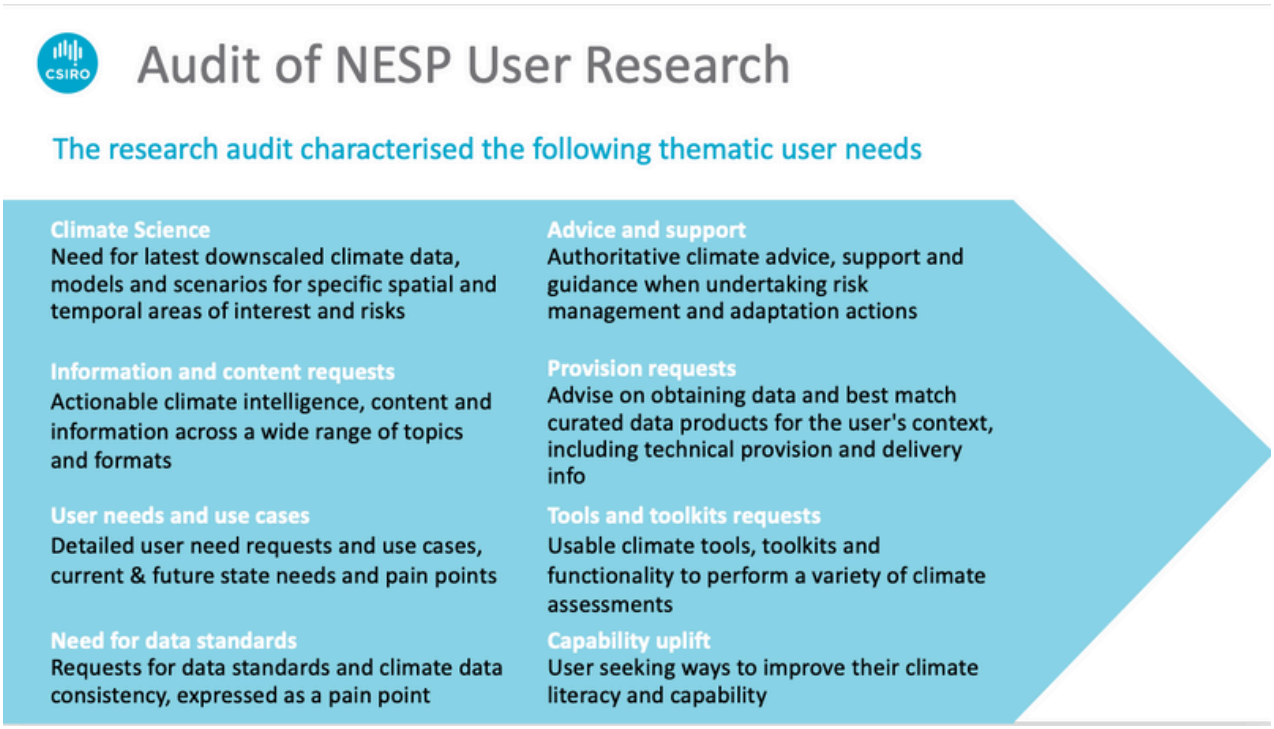
Coverage

The research included feedback and insights collected over the past 8 years from National stakeholders and previous NESP projects, including;

- co-design with State and Australian Govt knowledge brokers
- collaboration with ACS
- multiple state agencies
- energy Networks Australia, DAWE RAMSAR Team, Loddon Mallee CMA
- research covering existing climate data portals
- pre-and post-workshop surveys and insight summaries
- training workshops
- NESP hub stakeholder engagement

Characterisation of the user needs from research

The following thematic insights were synthesised from the review of the research around user needs and current pain points.



Thematic user needs (detail)

Data Needs

- datasets
  - type – projections, historical time series, gridded, etc
  - risk – Physical, Trans, hazard
  - sector
  - by activity (risk assessment, asset management, etc)
  - IFD
  - scale and Resolution - Temporal / Spatial
  - gaps
- modelling/projection requests, scenario assistance required
- data quality, accuracy, relevance, confidence issues
- usability, interoperability issues
- seeking the best available current data
- metadata – frequently not available or complete

Advice and support –

- help with specific user questions about the environment, climate change or adaptation
- lacking capability for science interpretation or confidence to make significant decisions
- advice from someone who understands their needs and can provide authoritative, considered advice that aligns with national/state policies
- what data should I use, and how do I apply it to my use case

Specific Info, guidance and content requests –

- format requests for
  - infographics
  - regional data visualisation
  - summary reports

    - slide packs
    - videos
    - case studies
- sector-specific info requests
- issues with First Nations engagement
- the need for actionable climate intelligence (not just data)
- issues with content not being fit for purpose.

User needs and use cases –

- detailed issues/barriers/pain points
- current state issues and workflows that cause friction.
- future state aspirations to alleviate pain points

Standards –

- need for consistent approaches, scenarios
- issues with the lack of standards across the climate sector

Delivery/provision requests –

- outputs – API's, download data extracts
- desire for site support, helping users to navigate to best-fit content
- provision and accessibility issues

Tools and toolkits requests

Horizon scan of existing climate portals

A review of 18 national and international climate portals was conducted in November 2023 during the discovery phase for the Gateway project. The objective of the scan was to assess the landscape of existing climate and adaptation resources, content strategy, site features and value offering.

Developing an understanding of existing climate resources is foundational for the development of a differentiated NESP hub Gateway strategy and positioning within a crowded information ecosystem.

Portals / Resources	Web Link	List of Site References (Meta Reference)	Resource References	Focus Area	Coverage
Climate Change in Australia	https://www.climatechangeinaustralia.gov.au/en/	Limited (2) - ESCI - Adapt NRM	Yes - scattered throughout site	Data, info and tools, educational but little focus on Adaptation - only REGIONAL TREND PAMPHLETS FOR ADAPTATION PLANNING regional trends resources Resource Centre with; • FAQ's • Case Studies • Info manuals • Glossary • Decision Tree • Tools • Infographics • Guidance on risk assessment • Impacts and Adaptation Resources	National
ESCI	https://www.climatechangeinaustralia.gov.au/en/projects/esci/	No	Yes - scattered throughout site	Focused on the Electricity sector with no specific adaptation resources • Factsheets • Case studies • Data / provision • Data Visualisation • Risk Framework • Glossary • Webinars	National
Adapt NRM	https://adaptnrm.csiro.au/	No	• Planning • Adaptation Checklist	- Reports - Adaptation Checklist	National
Climdex	https://www.climdex.org/	No			
IPCC Intercative Atlas	https://interactive-atlas.ipcc.ch/	No			
My Climate View	https://myclimateview.com.au/	No			
Long Paddock	https://www.longpaddock.qld.gov.au/	Yes - Use Resources section	https://www.longpaddock.qld.gov.au/about/resources/		
BoM Climate Change	http://www.bom.gov.au	Limited(3) – State of he climate - CCIA - My Climate View			National
CSIRO Adaptation	https://research.csiro.au/climate/	Yes - approx 20 links		Fairly shallow site, with Info under Adaptation themes, inc - sector info - general adatation concepts - papers /publications	National

Additional climate portal reviews were considered (as outlined in the table below)

Input Sources	Authors	Document
ACS climate portal review	Dörte Jakob, Mitchell Black, Naomi Benger, Michael Grose, Ben Hague, Justin Peter, Acacia Pepler January 2023	BRR-073.pdf
NESP hub climate portal review	David Hoffmann et al Shared Oct 2023	Data Portals - user survey-Kb.docx

Key findings

The key findings from the horizon scan are summarised below.

Finding	Details	Implications
Excellent climate and adaptation resources already exist	There are a consider number of climate portals in existence offering excellent content, data, tools, information and adaptation guidance at a National scale, including CoastAdapt, AdaptNRM, DrSAT	NESP hub needs to develop a differentiated strategy for the Gateway to avoid duplicating information and adding to existing users pain points associated with too much information
Overall lack of decision trees / guided search entry points	Most portals organise and present their content in traditional (flat information architectures) under main navigation menus and/or via site search functionality. They are not using decision trees or guided search functionality to help users to navigate towards content. Exceptions being DrSAT pathways	A guided search function or decision tree is likely to be a useful entry point for Alf and Bob representative users

Finding	Details	Implications
Curated references	Overall, most portal lack curated references to useful resources Exceptions being Long Paddock	Opportunity for the Gateway to service an existing gap in curated references to existing useful content
Limited use case coverage	Overall, most portals do not present defined use cases that map to related content offering as an entry point	Opportunity for the Gateway to help users discover info and data based on selection of their specific use case
Lacking in case studies	Similarly, most portals lack case studies that might otherwise help users to select and explore relevant data and information based on practical advice and/or best practice	Opportunity for the Gateway to help users discover info and data based on relevant case studies match to their own project, use case or requirements
Lacking metadata	Metadata is missing from the most portals which decreases the usability of the data and information and presents a barrier for appraisal and utilisation of data	Opportunity for the Gateway to provide improved access to data and decision-making support
Regional focus	ACS, MyClimateView, CCiA, DrSAT, EnviroData SA have regional (LGAs, NRM's) data dashboard, map selection entry points and information and related regional commodities	Information for the NESP Gateway to be mindful of when developing the content strategy

Research findings

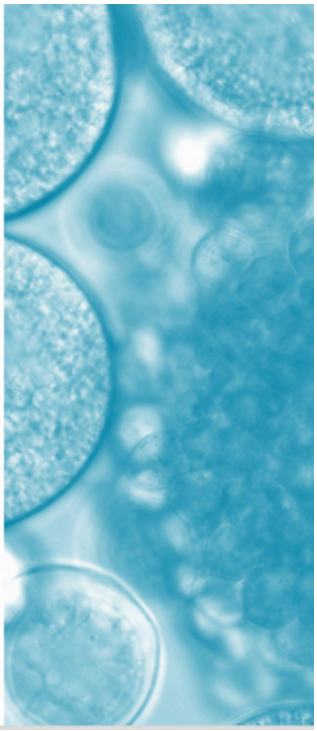
After conducting the desktop research activities described above, a point presentation of the initial research findings was presented to the NESP hub Gateway project team in November 2023.

This summary presented the need for a differentiated content strategy to not duplicate the extensive existing climate portal offerings identified in the horizon scan and additionally provided some hypothesised key user requirements for the Gateway to consider.

Audit Finding

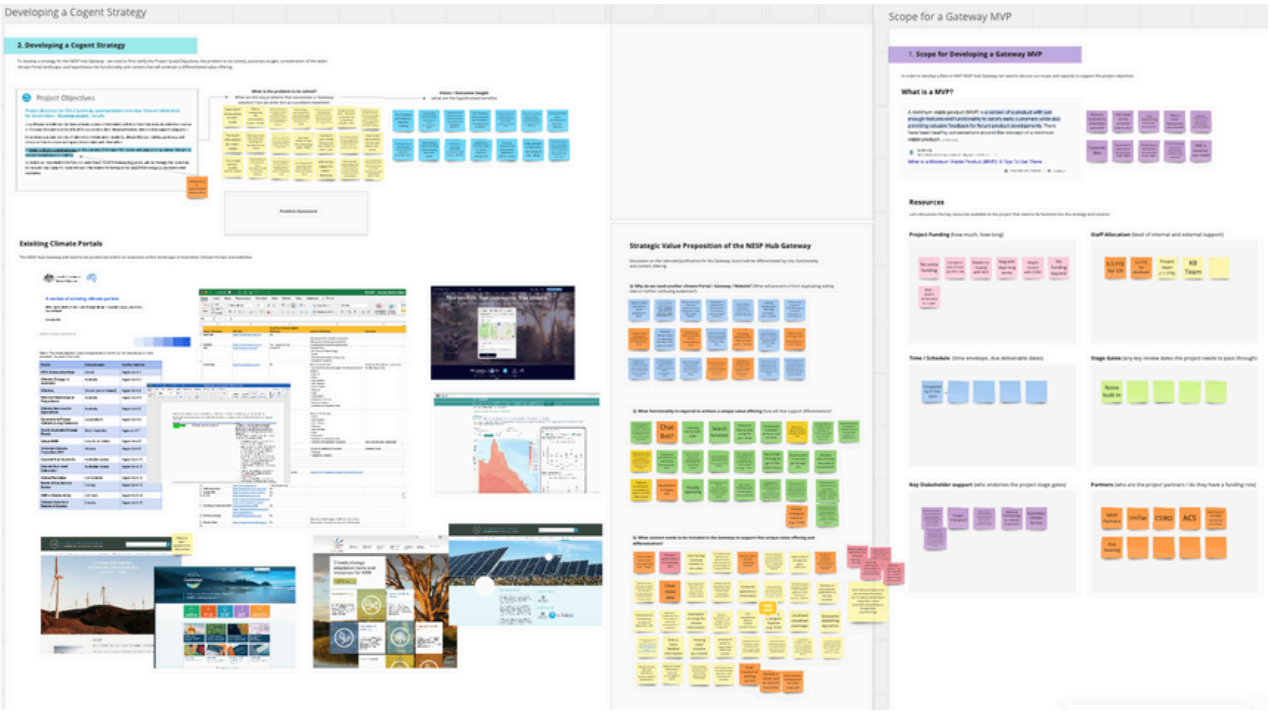
The evidence supporting a Gateway was assessed as:

- Not strongly correlated with the raw user data, but was a recurring finding in research summaries, describing the user need to curated guidance and clear signposted entry points
- Gateway concept would predominantly benefit novice (Alf and Bob) users looking for resources, advice and support on how to get started, rather than more technical users (Carol) seeking specific data requests
- Likely to be a practical and useful application, if Gateway effectively curates climate information and data resources for popular use cases, incorporating excellent metadata classification and clear ontologies of information into a database search capability and decision tree



Strategy workshops

Two strategy workshops were conducted with NESP hub CS3.2 project members and knowledge brokers on Nov 30th, 2023, and 16th January 2024, to capture key stakeholder feedback and domain knowledge in preparation for designing a user centred Climate Gateway.



Outcome sought

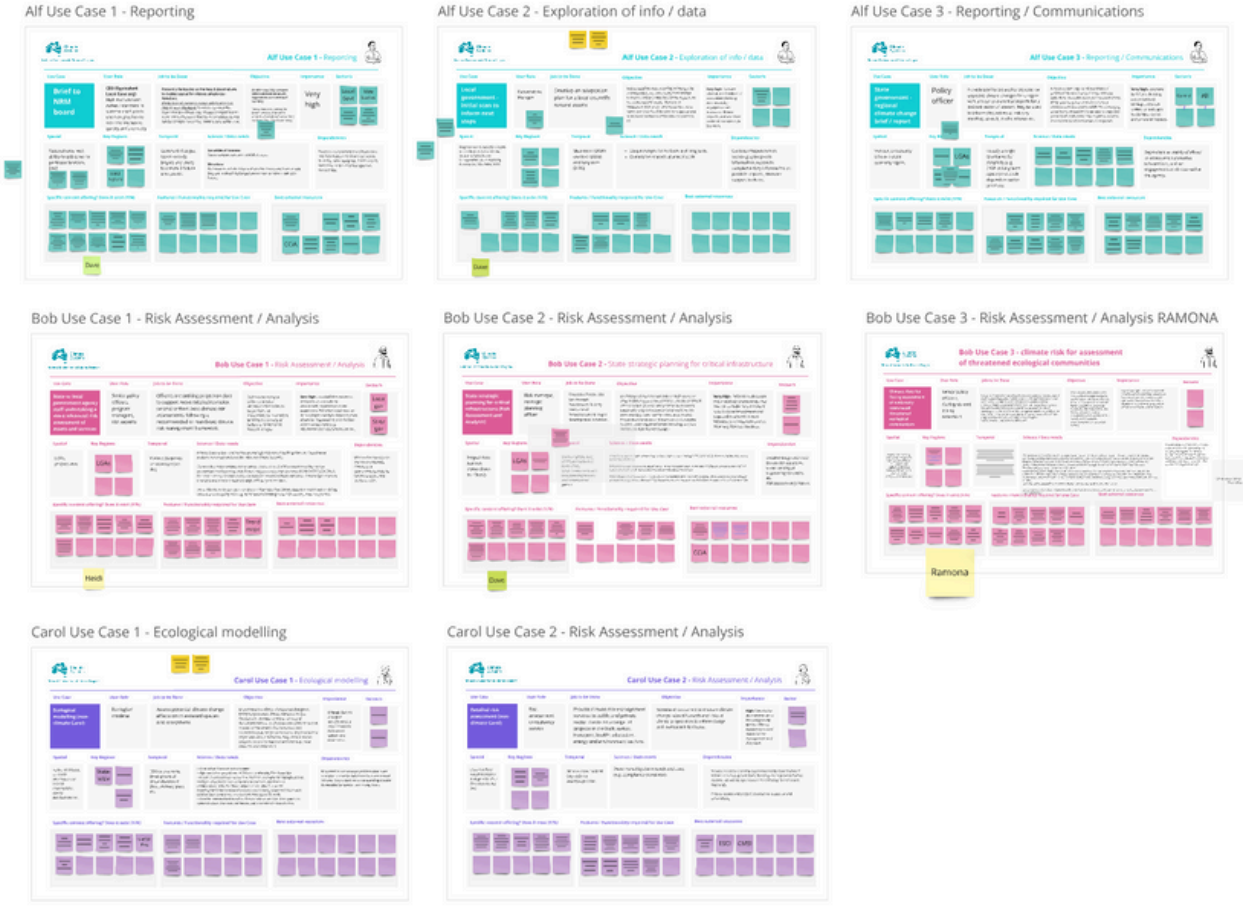
Development of a differentiated climate gateway portal that addresses an unfulfilled gap in the climate information available online and provides a solution to user pain points associated with the discovery and use of climate information and data for novice (Alf) to intermediate (Bob) users developed as project personas.

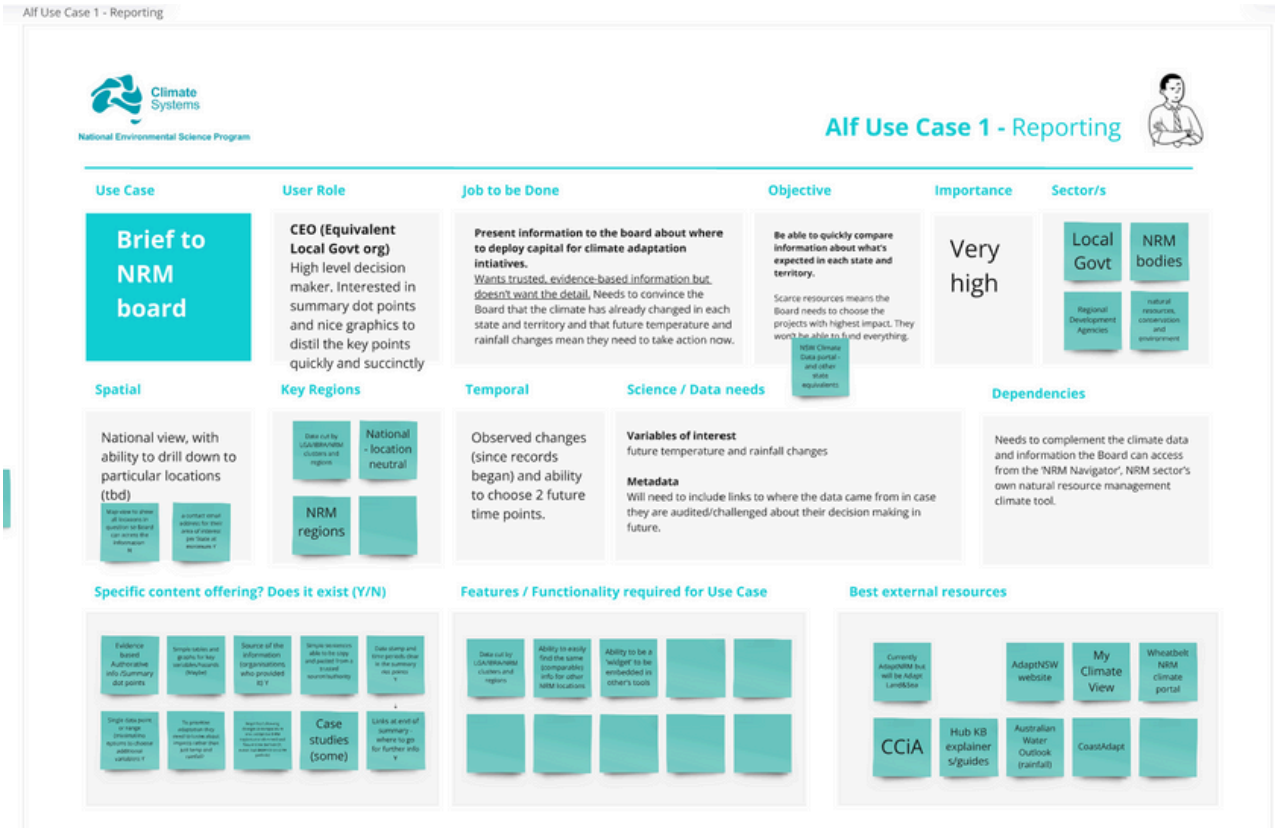
A summary of the Strategy workshop outputs was authored and can be made available upon request.

Use case development

UX facilitated use cases were developed between March - April 2024.

Combing the collective climate science knowledge and extensive stakeholder and industry experience of the CS4.2 project team and NESP hub Knowledge Brokers, eight prioritised use cases were formulated to represent archetypes of climate users and use cases. Each use case covered specific user needs and requirements relevant for their climate decision-making.





To assist the further prioritisation of our 8 use cases, the next UX task involved the development of a criteria for the project team to shortlist and ultimately select one key use case to explore more in greater depth.

Using an ecological Values based approach, the project team decided to focus on the climate and user requirements of the Queensland Parks and Wildlife Service of the Brigalow Belt South associated with their fire management activities.

Information architecture

Early site information architecture took place in May 2024, which was socialised for team feedback and input before later versions June - July 2024.

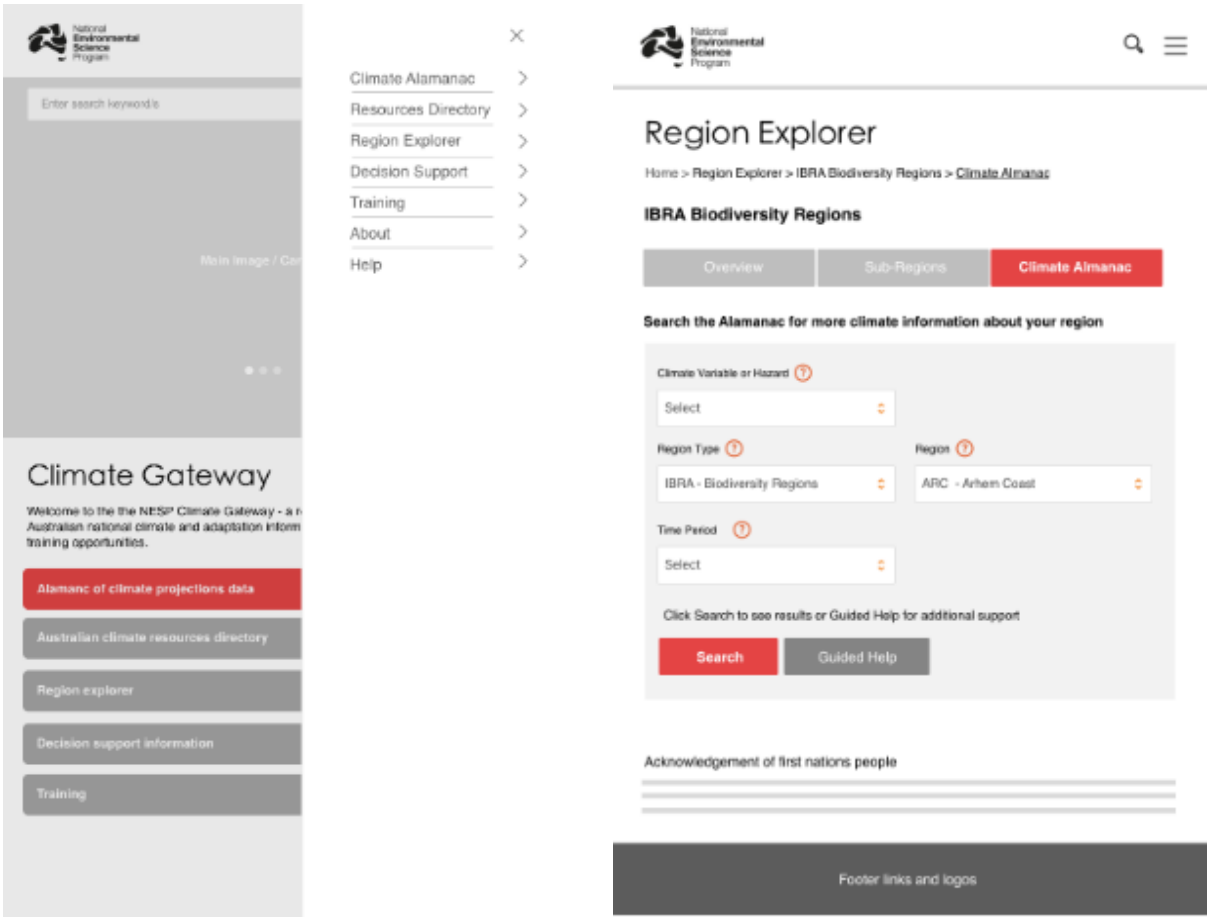
This work included analysis of the ideal user pathway towards the Gateway outcome, and exploration of search filtering solutions, prior to concept designs.

The information architecture work was foundational to establishment of a user interaction and engagement framework, that would underpin the next two phases of the design process, involving wireframing and hi-fidelity concept designs.

Wireframe development

Low-fidelity wireframes were undertaken in Aug 2024, initiating the start of the visual and interaction design process, which focused on the development of a graphic user interface, and associated layout, feature, navigation, content, usability focused requirements.

As is best practice, the wireframes concepts were developed using a mobile first approach (tablet), as this ensures the more compressed and complex layouts of mobile devices were not an afterthought, as often happens when to approach a design with only a traditional desktop platform in mind.



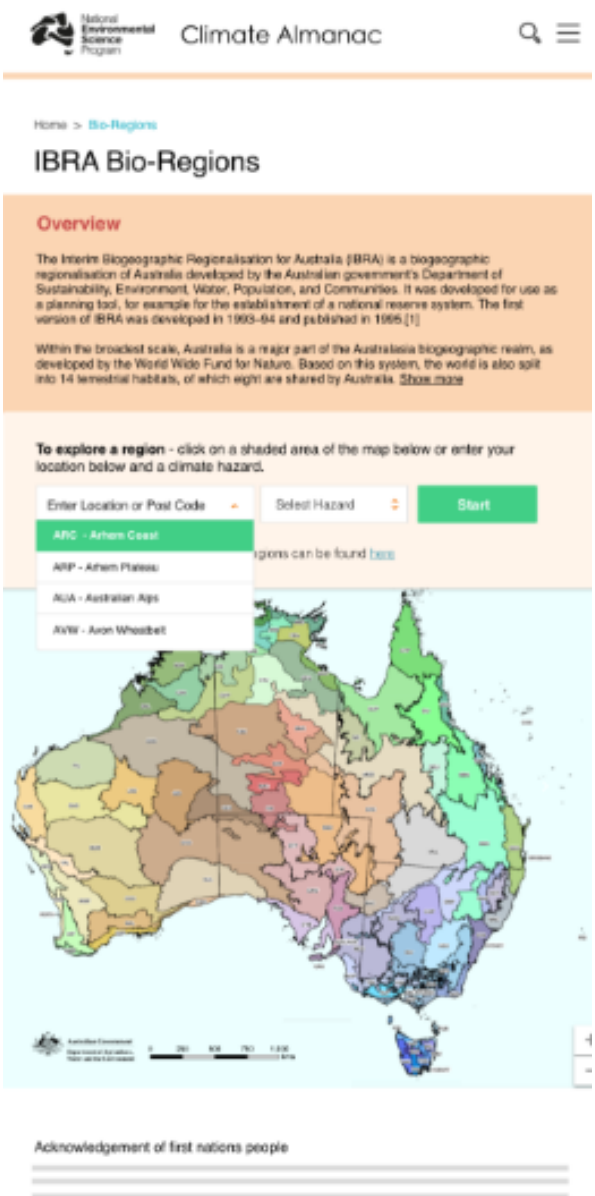
Stakeholder engagement

In October 2024, three members of the NESP hub CS3.2 project team travelled to Brisbane to meet with representative Queensland Parks and Wildlife Service users of the Climate Almanac portal.

The three-hour face to face workshop focused on capturing the data and user requirements of the Queensland Parks and Wildlife Service users and their fire management use cases. The workshop also afforded the opportunity for the NESP project members to discuss our nascent climate data and design approaches for input and feedback.

Concept designs

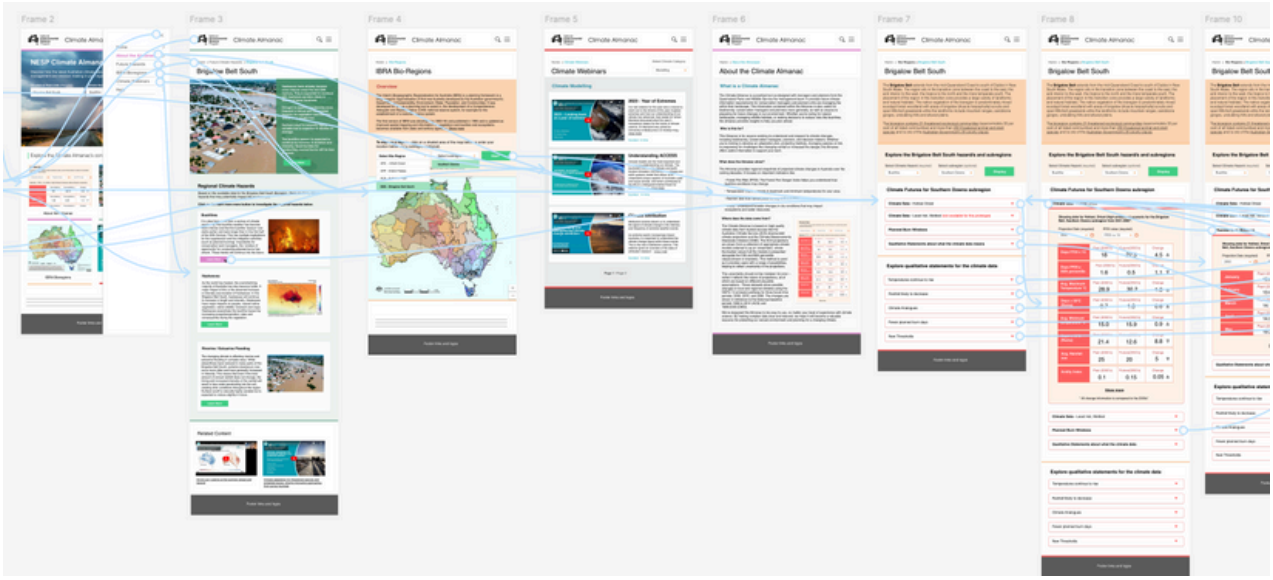
High-fidelity design concepts were then established November – December 2024, that focused on the user interactions to be supported in the Climate Almanac prototype.



Interactive prototype

Following the development of the final design concepts that incorporated the final climate science data and guidance content, an interactive Figma prototype was developed in January 2025. This online Climate Almanac portal prototype was then shared with the QPWS end users for feedback.

Link to the Climate Almanac prototype.



Climate Almanac video

To finalise the project and present the Climate Almanac in the most accessible way to NESP site visitors, a short 4-minute narrated video was produced to accompany the UX report and prototype link.

Tasks involved: script authoring, vocal recording and editing, screenshot capture, recording, attribution and title design and video editing. Several frames of the video are presented below.

Validation survey

In addition to an interactive prototype, a validation survey was developed in January 2025 (comprising 13 questions) to capture QPWS user feedback for the Climate Almanac prototype. This user feedback will support further refinement of the Climate Almanac designs and climate data and increase alignment with user needs.

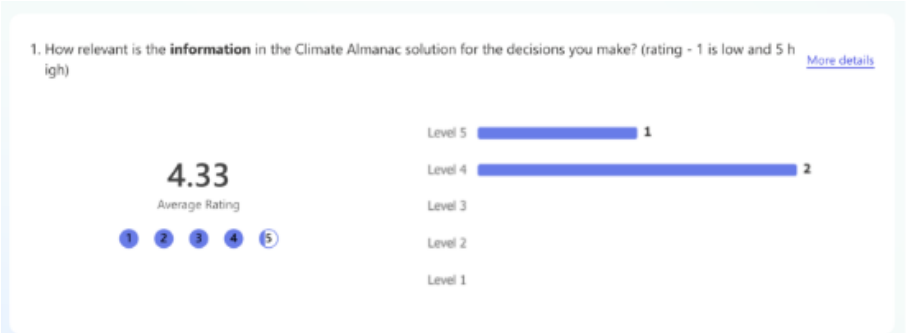
Survey link.

Stakeholder feedback

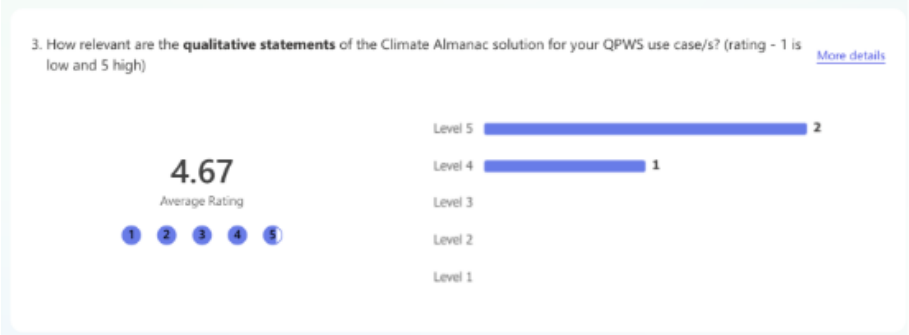
The Survey received 3 responses from the Queensland Parks and Wildlife Services representative users and 4 responses via email of the 6 participants involved – see quantitative and qualitative (comments) responses below.

The overall feedback is very positive, in terms of relevance of scientific climate data and guidance, ease of interpretation, usability of the user interface, information architecture and content structure, level of interest in using the data and assessment of the Climate Almanac as a valuable tool for the Queensland Parks and Wildlife Service in supporting the fire management use cases.

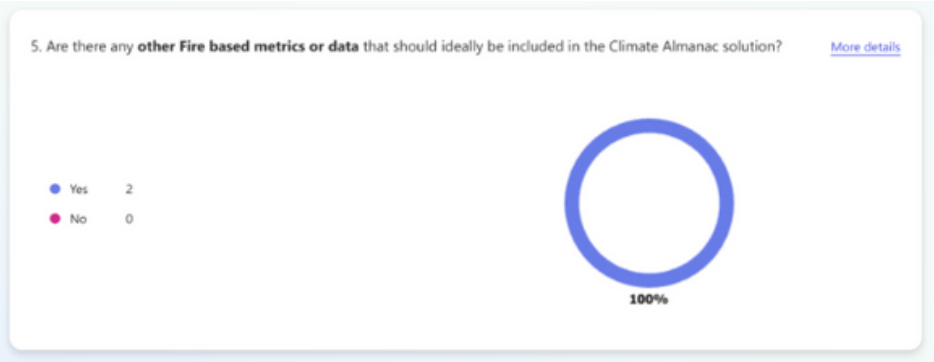
Question 1 – How relevant is the information in the Climate Almanac solution for the decisions you make?



Question 2 – How relevant are the qualitative statements of the Climate Almanac solution for QPWS use case/s?

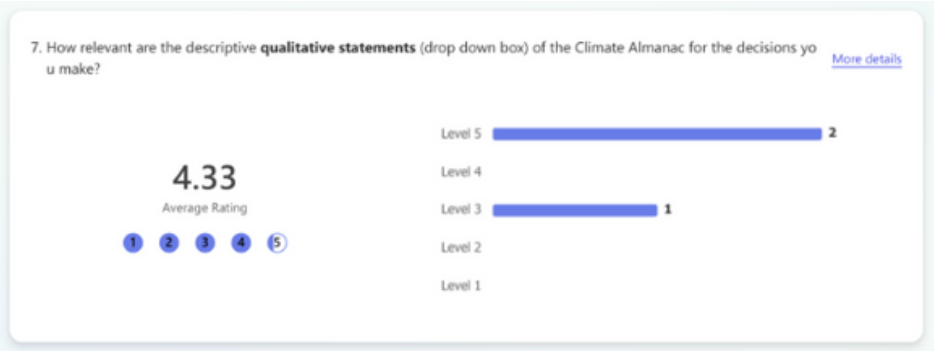


Question 3 – Are there any other fire-based metrics or data that should ideally be included in the Climate Almanac solution?



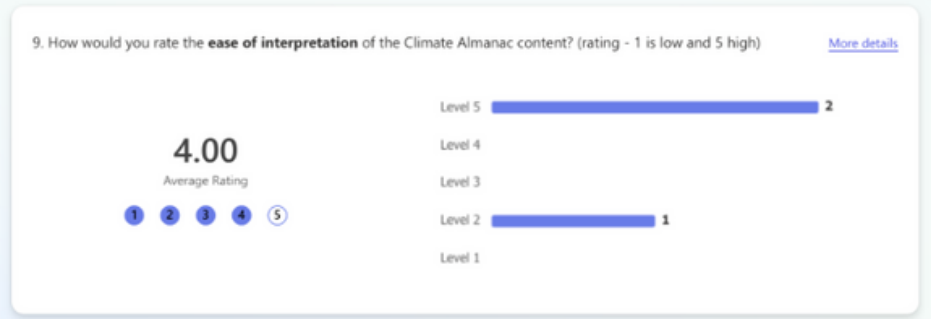
ID ↑	Name	Responses
1	anonymous	I don't know if anything useable can be done with wind speed, RH, KBDI?
2	anonymous	While I am a big fan of FDI, you need to be using the standard metrics that are adopted across the country. Perhaps 3-5 representative vegetation types of a pre-set fuel hazard could communicate the predicted FBI's?

Question 4 – How relevant are the descriptive qualitative statements (drop down box content) of the Climate Almanac for the decisions you make?

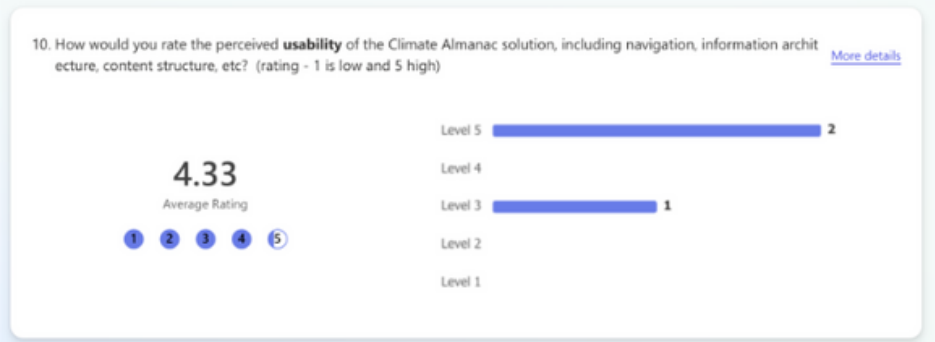


ID ↑	Name	Responses
1	anonymous	Didn't I answer that in Q3? The qualitative statements in the top section are a bit generalised and maybe not much use to me (fire planning). The bottom section ones are the handy ones for future decision making
2	anonymous	Relevant, concise and useful.

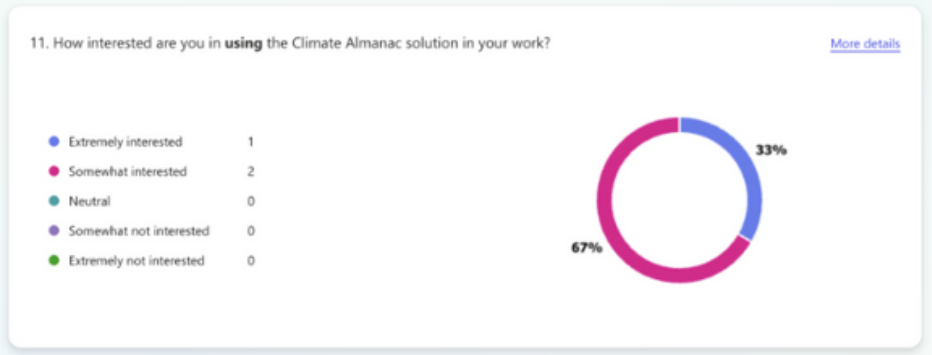
Question 5 – How would you rate the ease of interpretation of the Climate Almanac content?



Question 6 – How would you rate the perceived usability of the Climate Almanac solution (including navigation, information architecture, content structure etc)?



Question 7 – How interested are you in using the Climate Almanac solution in your work?



ID ↑	Name	Responses
1	anonymous	In the climate futures climate data dropdown, what is the period the data covers e.g. avg rainfall in the 2000s was 25mm - but over what period of time is not made clear (I know it's a month from the email, but without that it's an assumption).
2	anonymous	It is a simple tool presenting valuable, robust data in a way (and language) that should be easily understood by all.
3	anonymous	It is "ranger proof" it is simple enough that it can be interpreted readily. It is concise enough that people won't be put off by volumes of reading. I only chose "somewhat interested" because it informs a small (but important) part of my overall decision support system. Much of my work exists in considerably shorter time frames. That said, the almanac does provide critical indicators for longer term strategic planning and resource considerations.

Question 8 - Finally, do you have any other suggestions for further improvement of the Climate Almanac (e.g. climate data, functionality, content, etc?

ID ↑	Name	Responses
1	anonymous	It's very annoying that when you select a drop down arrow the window rolls to the top of the page resulting in having to scroll back to the drop down you just clicked.
2	anonymous	I'd love more time to analyse further and determine how such a tool would truly fit onto my overall decision support processes. Please keep going on it.

Note: the comment above about the prototype dropdowns being annoying is a limitation of the Figma prototype (not returning the user to the same page position when opening and closing dropdowns) and would not be an issue in a live coded version.

Additional feedback

Participant 1 — "*The Almanac is a really valuable tool for our staff. It is really simple to use (I am a luddite).*

It provides important and robust information in simple, easily understood terms that enable us to get a handle on what we are going to be facing in 5, 10 etc. years' time in terms of climate and what that means for fire and ecosystem management.

It has been produced by some of the cleverest and most experienced minds in the CSIRO and NESP Climate change teams who are fully across the research and modelling but are also highly experienced in translating that information to non-scientists. At least one person on the team has first-hand experience in park management including fire management as a ranger in the NT and Qld parks services. They were very inclusive of our interests and feedback in its development.
I am keen to see this progress from prototype to final product so that we can use it for all IBRA regions. It would be a very useful tool in the toolbox."

Participant 2 — *"From the people I circulated it to there was generally a general feeling that it was an advantageous tool for fire management planners/practitioners into the future and very simple to use. Whether your tool is specifically ingested into QPWS business at any particular stage or within a particular timeframe is undecided, but great to know that such a tool exists. Some of our staff highlighted their interest in seeing the progress to the final product so it can be used across all regions."*

"More specific feedback on the almanac is as follows:

- *wind and dryness could be considered, with a particular interest in wind (wind speed/strength or even possibly wind direction) from your modelling. Reason being:*
- *Wind is driving most fires and as in the Californian fires wind is creating an enormous problem for fire management.*
- *High wind speeds would also put a stop to planned burning and the accessibility of aircraft.*
- *Would be good to know if the higher temps and worse FFDI days, are also accompanied by higher winds*
- *Also, will FBI eventually be incorporated into the works or the works adapted to FBI rather than FFDI?"*

Participant 3 — *"I thought it was great and had no issues with it"*

Participant 4 — *"I really like the product. Is there any chance of teasing out wind? Wind feeds into FFDI and I was wondering if the models are able to inform us more about wind too. For example, high wind days >25km/h or more Westerly wind days would cause issues to us."*

Climate Systems

National Environmental Science Program

For more information

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