NACC

NARvis

About NARvis ❯ The Region ❯ Themes ❯ Climate Change ❯ Resources ❯

Desktop Assessment Report

June 2020

NRM VISION
for the
Northern Agricultural Region
of Western Australia

We respectfully acknowledge the Yamaji and Noongar people, and pay our respect to all Aboriginal people past, present and future.

Painting by Marian Dingo

"Bandang jinangij ngala nyoongar boodja danjoo"

"Barndi nhurra nganjungu barnagi yanayinha."

Contents

Background

NACC NRM is currently facilitating an update of the regional natural resources management (NRM) plan for the Northern Agricultural Region (NAR) as per the requirements of the Australian Government's National Landcare Program.

The purpose of the regional NRM plan is to identify and prioritise opportunities for NRM investment in the NAR based on:

1) collaboratively defined goals for the long-term economic, social, and environmental sustainability of the region, and
2) alignment, where possible and appropriate, with the stated outcomes of the Regional Land Partnerships Program 2018-2023 and the shared priorities of the Western Australian Natural Resources Management Framework 2018.

The current NAR NRM plan is the NARvis, a web-based and GIS-enabled platform containing interactive maps and content. Regional aspirations, goals, and a list of natural assets in the NAR, were generated out of extensive consultation processes in 2004/2005 (resulting in the 2005 regional NRM vision and aspirational targets) and 2012-2014 (resulting in the NAR asset register). The website content was created in 2015, with a focus on climate change impacts and adaptation options, and revised in 2017 to include updated regional aspirations and goals. The NARvis provides summary information relevant to NRM planning and implementation for each of the 15 Shires in the region as well as across several themes including biodiversity, agriculture, and climate change. The NARvis emphasises the role of the Noongar and Yamaji Traditional Owners in regional NRM.

Updating the NARvis will involve:

1) A technical component - updating the website with the latest available technical knowledge, including traditional knowledge, through desktop review and consultation with subject-matter experts, including a diverse technical working group.
2) An extensive community consultation process – reviewing and updating the regional aspirations and goals, and the priority assets for NRM investment in the region, based on current and emerging threats, opportunities, and regional priorities.

A first step of updating the NARvis platform involved a desktop review of the existing NAR NRM regional plan and the technical data resources available online by the NARvis Project Officer at NACC NRM. Desktop analysis included a review of all the current NRM plans in Western Australia and a literature review of the methodologies used. The results of this assessment are presented here and will be updated following consultation with the NARvis Technical Working Group and during the community consultation process.

This report contains

- A preliminary assessment of the strengths and weaknesses of the NARvis
- An outline of the NARvis Project Officer's scope of work
- A description of the activities and timelines for implementation of the technical component and community consultation component of the NARvis update
- A review of each section of the NARvis website with suggestions for amendments as part of the NARvis update
- A list of the latest available technical and data resources applicable to the NAR

NARvis: NRM Strategy Online

Strengths

1. **The NARvis is based on a long history of consultation with local stakeholders across a variety of sectors**:
   - the 2005 NRM Strategy consultation process which defined the sustainable development vision for the region and identified six assets: atmosphere, biodiversity, community, land, oceans & coasts, and water.
   - the 2012 INFFER-based NAR asset identification and prioritisation process which identified and ranked ~200 spatially explicit natural assets including species and places.
   - the 2015 consultation process to update the 2005 NRM strategy. This process sought to include detailed information on expected climate change impacts and climate change adaptation and mitigation options AND resulted in the current seven regional aspirations and the related 5-year goals and targets under each aspiration.
   - the 2017 update to the NARvis to include more detailed climate change information and a stronger recognition of the role of the Noongar and Yamaji Traditional Owners.

2. **The NARvis contains a wealth of information for planning and implementing NRM projects in the NAR**:
   - Tips on grant writing and a place to create a project map and share NRM projects.
   - Shire-specific summaries across a variety of data sets.
   - Spatially explicit biodiversity and land use data using interactive maps.
   - Detailed information under each theme, including publications and links to other sites.

3. **The NARvis presents data at the scale of the NRM region and at the scale of each Shire within the region**. This has tremendous value because:
   - a Shire is a political decision-making unit with access to resources and influence that can potentially be mobilised through a mainstreaming approach.
   - summarising Census data and data on threatened species and ecological communities, natural assets, climate, and local NRM groups at a familiar local scale is likely best for informing local actions.
   - natural assets of interest will likely be located within one or a small number of Shires.

4. **The NARvis provides well-balanced coverage of the agricultural, biodiversity, and community** aspects of sustainable development in the NAR via seven well-defined themes.

5. **The NARvis provides clear aspirations and specific goals for 2020** that are collaboratively developed, region specific, and organised under each of the seven themes.

6. **The NARvis includes an interactive map of the region on the home page** which enables navigation of the site at scales that are likely to be relevant to users.

Weaknesses

1. **The NARvis contains no baseline data against which to measure progress**
   - Not problematic for some goals e.g.: "25 management activities undertaken on sites of cultural and heritage significance by 2020" OR "75% of land managers engaging in coordinated management of invasive species".
   - Problematic for others e.g.: "Populations of threatened species and ecological communities are maintained or increased" OR "Increased community participation and capacity in the conservation of the region's natural resources".

2. **The NARvis goals and targets were developed up until 2020 and need to be updated,** which will involve identifying new goals and setting new targets for the next five to ten years.

3. **The NARvis contains many data and other resources that are now several years out of date**
   - The population trends and diversity data are based on Census data from 2011; more recent data are available now from Census 2016.
   - Since 2014, many more resources relevant to the NAR have become publicly available and could be included in the website (see attached Appendix: Technical & Data Resources for the Northern Agricultural Region).
   - The interactive maps have a few bugs that need to be corrected (e.g. not all polygons are labelled) and would benefit from updating (e.g. remnant vegetation, protected areas).
   - The News and Grants Calendar features have not been updated for several years.
   - Contact details are out of date.

4. **The NARvis contains many broken links and non-functional apps**
   - Links to the Australian Bureau of Statistics pages for each Shire are outdated.
   - The 'Share Your Project' and 'Create a Map' features do not work.

5. **The NARvis website includes unnecessary duplication of some components of the NACC NRM website**
   - The Grant Calendar, Tools & Apps, and News pages are probably better hosted on the NACC NRM website where related content is maintained and updated regularly.

6. **The NARvis websites includes some navigation pathways that are not user-friendly**
   - The tabs along the top of screen do not navigate to a thematic page when clicked, and when you click on the top-level tabs, the drop-down menus close.
   - The three homepage screens each show for too short a time to use the links provided (e.g. to the instruction video).
   - Climate change seems odd as its own tab - this is a cross-cutting issue which probably belongs in the region description, with further discussion under each theme.
   - Aboriginal History and Culture seems odd as a Theme given that all other themes are biophysical – Noongar and Yamaji Traditional Owners are, rather, a crucial partner and traditional ecological knowledge an important cross-cutting issue.

Way Forward

Scope of Work

   - Build on all the work that has already been done.

   - Conduct a rigorous and comprehensive community consultation and technical review process, using elements of the INFFER and Thresholds of Potential Concern methodologies as appropriate.

   - Plan the consultation and technical process around reviewing, updating, and refreshing the existing NARvis content and platform.

   - Focus the consultation and technical process on agreeing upon a higher level, long-term vision for the region, supported by updated aspirations, goals, and targets.

   - Develop a communications and training plan to deliver and support the use of the NARvis platform by partner organisations.

   - Keep an open mind throughout the consultation process and adjust the scope of work in line with feedback received from those participating in the NRM regional planning process.

Figure 1: Timeline for revision and update of the NARvis.

Technical Review Process

June 2020: Desktop review of NARvis content and platform (current report).

June 2020: Establish Technical Working Group (TWG) and conduct Inception meeting. The role of the TWG will be to:

1. Inform the 2021 update of the Regional Natural Resource Management Strategy for the Northern Agricultural Region, i.e. the NARvis;

2. Review and advise on changes to the Northern Agricultural Region asset register, with a view to informing NRM investment in the region;

3. Provide a technical review and assessment of community NRM priorities arising from the consultation process; and

4. Advise on the best ways to incorporate new and emerging datasets that are relevant to the Northern Agricultural Region into the NARvis platform.

The TWG will be composed of 12 technical experts representing government departments, research institutions, and NRM organisations. Members of the TWG will bring thematic and region-specific expertise on Aboriginal engagement, biodiversity conservation, climate change, sustainable production, and natural resource management to bear to ensure relevant and feasible NRM priorities are identified for the region through the community consultation process.

June 2020 – Mar 2021: Collect and synthesise relevant technical resources and data for the NAR and use these to update the NARvis; ensure ground-truthing through regular engagement with the TWG.

Community Consultation Process

June – July 2020: Conduct a scoping survey (online with telephone follow-up as required) with NACC NRM staff and stakeholders as the target population, to inform the design of the wider community consultation process. The purpose of the survey is to:

1. Introduce the current round of regional NRM planning;

2. Identify if, and in what ways, stakeholders are using the NARvis platform; and

3. Obtain a first impression of what stakeholders would like the regional NRM plan to deliver and how stakeholders wish to be engaged in regional NRM planning.

July 2020 – Feb 2021: Conduct a minimum of six local and regional community consultation workshops. Workshops will include a diverse range of stakeholders to be identified in consultation with NACC NRM program teams. Participatory planning techniques will be used in the workshops and discussions will focus on:

1. Evaluating the stated NRM vision for the NAR and assessing whether or not the long-term vision (to 2050) developed in 2005 still represents current and emerging threats, opportunities, aspirations, and priorities in the region.

2. Evaluating the current NARvis themes and assessing whether or not these are still relevant and adequately reflect the most important NRM sectors in the NAR.

3. Evaluating the current stated aspirations under each theme and assessing whether or not these are still relevant and adequately reflect the most important NRM aspirations for people living and working in the NAR.

4. Evaluating the current NAR asset register and assessing whether the list is accurate and complete and whether the prioritisation level of each asset is still relevant and adequately reflects the most important natural assets in the NAR.

5. Evaluating the current NRM targets under each theme and developing new SMART medium-to long-term targets (to 2030).

Update Website Content

July 2021 – May 2020: Update website content and layout in line with the latest available technical resources and the feedback received from the Technical Working Group and during community consultation workshops.

I have reviewed the content and organisation of the website and offer potential updates in the table below. Achieving these tasks is subject to 1) having access to the available skills and/or budget in the NACC NRM team (including my own skills and time) and 2) the NACC NRM executive, NARvis TWG, and community consultation process also identifying these tasks as necessary and/or desirable.

It is my assessment that the NARvis is best positioned as a project proposal design resource for NRM practitioners in the NAR and should be set up as such. The most important components of the NARvis website in its current form, which should be retained in any revised version, are:

1. The regional overview and per Shire summaries that provide background information and details across themes for spatially explicit administrative areas within the region;

2. The mapping tools, including the interactive interface with the assets (currently working although due for an update) and the 'Share Your Project' and 'Create a Map' features (currently not working); and

3. The lists of aspirations, goals, and targets under each theme.

Please see a detailed review of the NARvis website on the next page.

Table 1: Assessment of each element of the NARvis website, with suggestions for how these elements can be updated and restructured if required.

Element	Status	Proposed Action
Regional Profile	*Extremely important feature*	*Retain in revised version.*
	Population data is out of date	Update with Census 2016 data and latest WA population forecasts. Update with Aboriginal Heritage Places.
	Climate data is out of date	Update with BOM data on current climate. Update with climate projections data from BOM, the Climate Change in Australia Report, and Climate Projections for NRM regions.
	Map of the region is out of date	Include Houtman-Abrolhos Islands as a new protected area. Update other protected areas. Update remnant vegetation and assets data if this is available. Add a map of the NRM footprint in the region (investment and/or implementation).
Shire Profiles	*Extremely important feature*	*Retain in revised version.*
	Population data is out of date	Update with Census 2016 data and latest WA population forecasts. Fix links to Australian Bureau of Statistics website. Update profiles of and links to local NRM groups for each Shire. Update with Aboriginal Heritage Places.
	Climate data is out of date	Update with BOM data on current climate.
	Biodiversity data may be out of date	Update Publications and Research.

		Update threatened species, threatened ecological communities and natural assets.
		Fix maps so that all features (polygons) are correctly labelled and clickable.
	Photo galleries could be refreshed	Update photo galleries.
		Include a downloadable image (map) of the area – e.g. a Google Earth image with the Shire boundary, protected areas etc. drawn on it and/or a cut away from the map on the home page.
	News & Updates section is not maintained	Consider removing this section and instead linking directly to the news pages for each LGA and for NACC NRM.
	Current Projects section is not maintained	Consider removing this section and instead link directly to the current projects page for NACC NRM.
Regional Aspirations and Goals	*Extremely important feature*	*Set up as its own main tab in a revised version.*
	Resources section is not maintained	Update resources section under each aspiration.
	'What is Being Done' statement does not seem to link to anything	Remove 'What is Being Done' statement or link it to the correct section.
	The 'Share This Page' links do not work	Work with NARvis Communications Officer to ensure all links work and set up the sharing format consistently as, for example, Facebook or Twitter cards.
	Currently tucked away under the 'About NARvis' tab	Make Regional Aspirations and Goals into its own tab as part of a new section of the website where regional groups can easily check if their project is aligned with the regional NRM plan.

NARvis Summary Document	*Extremely important feature*	*Retain in revised version.*
	Current version was updated in 2017	Add an updated version in 2021, after completing the desktop review, technical review, and community consultation process. Archive previous version(s).
Themes	*Extremely important feature*	*Retain but modify for a revised version. Reformulate this section as a dashboard linking to Thresholds of Potential Concern (or similar).*
	Current themes: Biodiversity, Coastal & Marine	Bring Coastal & Marine and Biodiversity together under one Biodiversity theme, with sections for Terrestrial, Coastal, Marine, and Aquatic biodiversity.
	Current themes: Aboriginal History & Culture	Remove Aboriginal History & Culture from themes and incorporate this information rather into the Regional Profile section. All the other themes are biophysical. Aboriginal People are important landowners, land users, conservation practitioners, holders of traditional ecological knowledge, and NRM stakeholders. This needs to be reflected throughout the website in the sections focused on implementation (What Is Being Done, What Can You Do) and knowledge (heritage places). Consider adding bush foods and medicines information.
	Current themes: Water	Relabel the Water theme as Freshwater.
	Current themes: Geology & Soils	Remove the Geology and Soils theme and incorporate this information rather into the Regional Profile section. Feature any information relevant to Soil Health under the (current) Land Use theme.
	Missing theme: Invasive Species	Add a new theme: Invasive Species, Pests, and Diseases - Biosecurity.

	What's Being Done and What Can You Do sections need to be updated	Update What's Being Done and What Can You Do sections. Consider setting these up as separate primary tabs or linking to them only via the Get Involved tab.
	Highlights a few species (Mallee Fowl, Carnaby's Cockatoos)	Avoid highlighting a small number of species. This risks limiting activities to only these species and excluding all those interested groups and partners who work on other species. Rather list all threatened and priority species and ecological communities with photos and whatever information is available. Specific projects on specific species can be listed under the What's Being Done sections, which could be organised around the themes.
Climate Change	*Extremely important feature*	*Does not need to stand alone as its own separate section. Integrate impacts for the region into the Regional Profile and specific adaptation and mitigation actions into each of the themes.*
	Detailed information on climate change, how models and projections work, definitions of adaptation and mitigation	Shorten substantially into a background paragraph with links to further reading for anyone who is really interested in the nuts and bolts of climate models. Do not include as separate sections.
	Section on climate change impacts in the NAR is out of date	Update with the latest available climate projections for the region, using the existing format.
	Sector specific climate change vulnerabilities lack sufficient detail	Update main impacts of climate change in the NAR section with expected impacts per theme. Include a discussion of relevant expected climate change impacts within each theme.

Resources	*Important feature*	*Retain but modify for a revised version.*
	Tips on grant writing is useful but the grants calendar is not being maintained and the 'Create a Map' feature does not work	Update tips on grant writing. Provide links to new resources on grant writing. Ensure that the map making tool works. Link the Grants Calendar to a similar section of the NACC NRM website, where it is being regularly updated, or remove this feature.
	Not clear if CoastCare Resources belongs as a separate section here	Check with team if this is still needed. If not, then remove it. If yes, then either update it or move it to the NACC NRM website.
	Map Gallery is a nice feature – may need updating and not all apps work	Update Map Gallery to include some static maps for download as well as the interactive maps. Update interactive maps here required. Ensure all map apps are working. Provide links to other interactive mapping tools.
	Tools and Apps section is not being maintained.	Remove from the NARvis site and redirect to the NACC NRM website where the list of current apps and tools is maintained.
	News section is not being maintained	Remove from the NARvis site and redirect to the NACC NRM website where project news is regularly updated.
	Publications list if out of date	Update publications list.
	Glossary and references are probably worth keeping in	Ensure that the glossary and reference list reflect other changes made to the website. Update reference list.

Get Involved	*Important feature*	*Retain but modify for a revised version.*
	List of NRM groups in the region is out of date	Update the list of active NRM groups in the region and ensure these can be sorted by Shire using the existing drop-down menu.
	'Share Your Project' feature does not work	Fix the 'Share Your Project' feature. Add NRM footprint layer to the map. Add a few recent NACC projects as examples.
	Not clear if Recycling belongs as a separate section here	Check with team if this is still needed. If not, then remove it. If yes, then either update it or move it to the NACC NRM website.
What's Being Done	*Important feature*	*Retain but modify for a revised version.*
	Currently located within each theme	Consider moving to the Get Involved tab and organising by theme.
Contact Details	*Important feature*	*Retain in revised version.*
	Contact details are out of date, directing users to a staff member who has since left NACC NRM	Update contact details. Consider giving Ella's name and the nacc@nacc.com.au email address here or including a contact form, so that Ella can direct the queries to the appropriate person as roles change in the organisation over time.
Missing Element	Primary tab for Regional Goals	This will add value by directing users to the information they need to be able to check alignment of proposed projects with NRM priorities for the NAR. This tab should: - clearly state the collective long-term vision for the NAR that was developed based on community consultation. - show the Regional Land Partnership Program 2018-2023 outcomes relevant to the NAR. - show the Western Australian Natural Resources Management Framework 2018 shared priorities.

		- list the collaboratively defined and region-specific NRM aspirations and goals for the NAR.

Appendix: Technical & Data Resources for the Northern Agricultural Region

Theme	Resource	Link
Biodiversity	Australian Fauna Directory (taxonomy)	https://biodiversity.org.au/afd/home
	Australia's Nature Hub (actions for nature)	https://www.australiasnaturehub.gov.au/
	Collaborative Australian Protected Areas Database (CAPAD)	http://www.environment.gov.au/land/nrs/science/capad/2018
	Conservation Advice and Recovery Plans (organised by NRM management unit)	http://www.environment.gov.au/cgi-bin/sprat/public/conservationadvice.pl
	Conservation Management Zones	http://www.environment.gov.au/biodiversity/conservation-management-zones
	FeralScan – create maps of feral animal occurrence	https://feralscan.org.au/
	Florabase (lists of conservation taxa by LGA or IBRA, distribution maps, weeds)	https://florabase.dpaw.wa.gov.au/
	Flora of Australia	https://profiles.ala.org.au/opus/foa
	Forest cover interactive map	https://www.agriculture.gov.au/abares/forestsaustralia/forest-data-maps-and-tools/native-forest-data-visualisation
	Interim Biogeographic Regionalisation for Australia (IBRA7) 2018	https://florabase.dpaw.wa.gov.au/help/ibra/ https://www.environment.gov.au/land/nrs/science/ibra/australias-bioregions-maps
	Map environmentally sensitive areas, protected areas, IBRA subregions, Crown land	http://lbp.asn.au/module/enviro#map
	Migratory Species	http://www.environment.gov.au/biodiversity/migratory-species
	National Landcare Program	http://www.nrm.gov.au/national-landcare-program

	National Vegetation Information System	http://www.environment.gov.au/land/native-vegetation/national-vegetation-information-system/data-products
	NatureMap (WA flora and fauna by LGA, IBRA, or custom area)	https://naturemap.dbca.wa.gov.au/
	Northern Agricultural Region NRM Plan	https://www.narvis.com.au/
	Pre-European Vegetation Map	https://researchlibrary.agric.wa.gov.au/gis_maps/16/
	Remnant Native Vegetation Extent Map 2016	https://researchlibrary.agric.wa.gov.au/gis_maps/18/
	State of the Environment Report	https://soe.environment.gov.au/
	Strategy for the National Reserve System 2030	https://www.environment.gov.au/system/files/resources/643fb071-77c0-49e4-ab2f-220733beb30d/files/nrsstrat.pdf
	Threatened Species and Ecological Communities	http://www.environment.gov.au/biodiversity/threatened
Climate Variability & Change	Adapt NRM planning resources	https://adaptnrm.csiro.au/home
	Canute 3 (estimates of likelihood of coastal flooding)	https://shiny.csiro.au/Canute3_0/
	Carbon neutral standards for building, organisations, events, etc.	https://publications.industry.gov.au/publications/climate-change/climate-change/government/climate-active/publications.html
	Climate Change in Australia (technical report with high resolution figures available for download)	https://www.climatechangeinaustralia.gov.au/en/publications-library/figures-and-maps/
		https://www.climatechangeinaustralia.gov.au/
		https://www.climatechangeinaustralia.gov.au/en/impacts-and-adaptation/ssw-flatlands/
		https://terranova.org.au/repository/southern-and-southwestern-flatlands-nrm-collection/southern-and-south-western-flatlands-data-layers
	Climate projections for NRM regions	https://www.climatechangeinaustralia.gov.au/en/climate-projections/future-climate/regional-climate-change-explorer/sub-clusters/?current=SSWSW&popup=true&tooltip=true
		https://www.climatechangeinaustralia.gov.au/en/climate-projections/explore-data/about-data/

Climate projections for farming in WA	https://www.agric.wa.gov.au/climate-change/climate-projections-western-australia
Climate projections for rainfall, comparing 1910-1999 with 2000-2019, maps produced in 2020	https://researchlibrary.agric.wa.gov.au/gis_maps/3/
CoastAdapt, including Sea Level Rise and You & various sector specific risk assessments	https://www.coastadapt.com.au/
Coastal Climate Adaptation Decision Support Tool	https://www.coastadapt.com.au/climate-change-adaptation-decision-support-c-cads
Historical climate data (limited) from local weather stations	http://www.bom.gov.au/climate/data/
Intergovernmental Panel on Climate Change 5th Assessment Report	https://www.ipcc.ch/report/
Long range weather forecasts	http://www.bom.gov.au/climate/outlooks/
Map average annual rainfall and evapotranspiration	http://lbp.asn.au/module/enviro#map
Monthly summaries of rainfall, drought, temperature, and extreme weather by region or town	http://www.bom.gov.au/climate/current/
Historical summaries of extreme weather and weather records (hottest day etc.)	http://www.bom.gov.au/cgi-bin/climate/extremes/extreme_maps.cgi http://www.bom.gov.au/climate/extreme/records.shtml
National Climate Change Adaptation Research Facility publications	https://www.nccarf.edu.au/localgov/resources
National Climate Resilience and Adaptation Strategy 2015	https://www.environment.gov.au/climate-change/adaptation/strategy
National Greenhouse Gas Inventory	https://www.industry.gov.au/data-and-publications/national-greenhouse-gas-inventory-september-2019
State of the Climate report 2018	https://www.csiro.au/en/Showcase/state-of-the-climate
Time series graphs and historical trend maps of climate variability by region	http://www.bom.gov.au/climate/change/#tabs=Tracker&tracker=timeseries
Video of temperature change to 2093 relative to 1850-1900	https://www.csiro.au/en/Research/OandA/Areas/Assessing-our-climate/ACCESS

Coastal & Marine	*Also see Biodiversity and Climate Variability & Change*	
	Information on WA's managed fisheries	*http://www.environment.gov.au/marine/fisheries/wa-managed-fisheries*
Geology & Soils	Advice on managing soils	https://www.agric.wa.gov.au/climate-land-water/soils/managing-soils
	Characteristic Soils Map 2003	https://researchlibrary.agric.wa.gov.au/gis_maps/13/
	Interactive map of surface geology, soil landscape zones, and characteristic soils	http://lbp.asn.au/module/enviro#map
	MySoil tool to identify soil types in WA	https://www.agric.wa.gov.au/managing-soils/mysoil
	Soil quality indicators by NRM region	http://www.soilquality.org.au/au/wa/wa-northern
Land Use	Advice on mixed salt-tolerant pasture for addressing dryland salinity	https://www.agric.wa.gov.au/climate-land-water/soils/managing-soils https://www.agric.wa.gov.au/soil-salinity/saltbushes-dryland-salinity-management
	Area of land under clearing permit	https://www.der.wa.gov.au/our-work/clearing-permits/27-clearing-permits
	Australian Bureau of Agricultural and Resource Economics and Sciences (agricultural census data, commodity prices)	https://www.agriculture.gov.au/abares
	Capability for Annual Pasture Map 2013	https://researchlibrary.agric.wa.gov.au/gis_maps/19/
	Carbon farming resources	https://www.agric.wa.gov.au/climate-land-water/land-use/carbon-farming http://www.cleanenergyregulator.gov.au/ERF/Pages/default.aspx
	Farm commodity prices	https://www.mla.com.au/prices-markets/market-reports-prices/# https://www.agriculture.gov.au/abares/research-topics/agricultural-commodities/mar-2020 http://www.awex.com.au/market-information/awex-wool-market-indicators/ http://statistics.mla.com.au/Report/List
	Farm statistics – demographics, farm size, management practices etc.	https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/7121.02017-18?OpenDocument

		https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/4627.02016-17?OpenDocument
	Financial performance of farms WA	https://www.agriculture.gov.au/abares/research-topics/aboutmyregion/farm-financial-performance-wa#performance-of-broadacre-farms
	Fire risk assessment and fire history interactive map	http://lbp.asn.au/module/enviro#map
	Generalised Land Use Map 2017	https://researchlibrary.agric.wa.gov.au/gis_maps/10/
	Generalised Regions Map 2014	https://researchlibrary.agric.wa.gov.au/gis_maps/11/
	Identifying bushfire prone areas	https://maps.slip.wa.gov.au/landgate/bushfireprone/
	Land Tenure Map 2019	https://researchlibrary.agric.wa.gov.au/gis_maps/3/
	Landgate Land Monitor (salinity, land cover changes 1972-2018)	https://landmonitor.landgate.wa.gov.au/home.php#
	MyCrop apps for identifying production constraints for wheat, barley, canola, oats, and pulses	https://www.agric.wa.gov.au/mycrop
	MyPaddock tool for estimating the effects of crop problems on expected yields	https://www.agric.wa.gov.au/mypaddock
	Pasture Improvement Initiative (Enrich Project; research on perennial forage shrubs)	https://pastureimprovementinitiative.com.au/research/enrich/
	Planfarm benchmark reports on the financial performance of broadacre farm in WA	http://www.planfarm.com.au/products/planfarm-benchmarks.html https://www.bankwest.com.au/business/insights/unseasonal-rainfalls-fail-to-dampen-wa-farm-businesses
	PlanWA interactive land information map (address, zoning, area)	https://www.dplh.wa.gov.au/planwa
	Potential yield tool for cereals	https://www.agric.wa.gov.au/climate-weather/potential-yield-tool
	Potentially Arable Areas Map 2016	https://researchlibrary.agric.wa.gov.au/gis_maps/20/
People & Heritage	Aboriginal Heritage Enquiry System	https://espatial.dplh.wa.gov.au/AHIS/index.html?viewer=AHIS
	Australian Bureau of Statistics Census Data	https://www.abs.gov.au/websitedbs/D3310114.nsf/Home/Census
	Map of Aboriginal Heritage Places	http://lbp.asn.au/module/enviro#map

	Map population density by LGA or basic community	http://lbp.asn.au/module/enviro#map
	National Heritage Sites	http://www.environment.gov.au/heritage
	Western Australia population forecasts to 2031 (by LGA)	https://www.dplh.wa.gov.au/information-and-services/land-supply-and-demography/western-australia-tomorrow-population-forecasts
Water	Directory of Important Wetlands in Australia	http://www.environment.gov.au/water/wetlands/australian-wetlands-database/directory-important-wetlands
	Geoscience Australia	https://www.ga.gov.au/about
	Ground water and salinity map	https://www.agric.wa.gov.au/resource-assessment/interactive-groundwater-and-salinity-map-south-west-agricultural-region#legendmap https://www.agric.wa.gov.au/soil-salinity/dryland-salinity-extent-and-impact
	Groundwater trends in agricultural areas, with details by hydrozone	https://www.agric.wa.gov.au/report-card-conditions-and-trends/groundwater-trends-agricultural-areas-western-australia
	Maps of groundwater regions and sub-regions, and groundwater dependent ecosystems	http://lbp.asn.au/module/enviro#map
	Maps of rivers and lakes	http://www.bom.gov.au/water/groundwater/explorer/map.shtml
	Water levels in rivers (River Monitoring Stations)	https://kumina.water.wa.gov.au/waterinformation/telem/stage.cfm
	Water Reporting Information (quality, water levels, stream flow)	http://wir.water.wa.gov.au/Pages/Water-Information-Reporting.aspx
	Wetland mapping (limited)	https://www.dpaw.wa.gov.au/management/wetlands/mapping-and-monitoring?showall=