



## THE REGIONAL NRM PLANNING FOR CLIMATE CHANGE PROJECT

Regional Natural Resource Management (NRM) Plans are important mechanisms to support integrated management of natural resources underpinning economic activity and regional wellbeing.

Regional NRM organisations recognised the need to systematically include Climate Change considerations in their planning.

### Regional NRM Planning for Climate Change -Project Background

Through the Australian Government Project “Regional NRM Planning for Climate Change”, 53 regional natural resource management (NRM) organisations around Australia were able to update their regional NRM plans to incorporate climate change impacts and adaptation approaches. The project also developed a geographical information system (GIS) platform to identify where carbon planting projects should be located in the landscape to maximise the benefits for biodiversity, water and agricultural production.

The project was supported by the Centre for Excellence in NRM (CENRM), AdaptNRM and National Climate Change Adaption and Research Facility (NCCARF). These organisations have conducted research to produce regional-level climate change information to support medium term natural resource management planning, as well as providing a range of other planning and adaptation tools. Stream 2 has also delivered regional climate projections which includes the results from the new Coupled Model Intercomparison Project Phase 5 (CMIP5) data.

NRM groups around Australia were classified into similar regions based on their climate type. South West Catchments Council (SWCC), Peel-Harvey Catchment Council (PHCC), Northern Agricultural Catchments Council (NACC), South Coast NRM, Perth NRM and Wheatbelt NRM are part of the Southern and South-Western Flatlands NRM Cluster. Members of each of these NRM organisations worked together in the Stream 1 Working Group to help facilitate and progress the project.

### PROJECT OUTCOMES

1. **Updated, new and/or revised regional NRM plans:** all NRM Regional organisations in Western Australia have updated their plans to include climate change science, information and scenarios to plan for the impacts of climate change.
2. **Creation of new GIS maps and update of GIS databases to support NRM:** the project collated and developed new datasets (such as high biodiversity asset, wildlife corridors, climate refugia, high value agricultural land and others) as well as the collation of data from many different sources that were relevant to carbon planning and NRM more generally. Cross regional datasets were also developed that can support future biodiversity planning.
3. **Modelling tool:** Stream 1 Working Group agreed to use a similar spatial analysis tool Multi-Criteria Analysis Shell for Spatial Decision Support tool (MCAS-s). This modelling tool encouraged stakeholder participation in the planning process. The tool was interactive, enabled live participation by the stakeholders, supported integration of location knowledge and finally can be used to guide future investment.

4. **Carbon plantings:** As each NRM region used the same tools and framework for prioritising carbon plantings, it provides a level of consistency for the south west community interested in developing carbon plantings and provides a robust platform for the Australian Government to refer to when considering NRM benefits from proposed carbon planting projects. This is a approval requirement of the current Emission Reduction Fund requirement for carbon farming projects.
5. **Development of carbon planting guidelines:** associated with the mapping, guidelines have been developed that provide guidance to avoid and mitigate potential risk and adverse impacts associated with carbon plantings in the landscape (including impacts on biodiversity, water resources and production systems). These Guidelines have been supported in principle by the all NRM organisations in the Flatlands Cluster and have been used as an example for other NRM Regions around Australia. These guidelines will be provided to Emissions Reduction Fund proponents to ensure their carbon planting projects adhere to the applicable Regional NRM Strategy.
6. **Improved Community Access to Climate Change Information:** Each region has incorporated and interrogated information from the Stream 2 climate and biodiversity research programs for their region. This has included providing online access to key climate change information and maps showing climate change impacts and the variation within each region. A page on the NRM WA website has also been established to provide summary information and cross regional mapping of climate change across south western WA.
7. **Formation of a cross regional NRM Planning & Climate Change Working Group:** This supported an unprecedented level of cross-regional and national collaboration. The Stream 1 Working Group includes membership of each Climate Leaders and GIS officers from NRM organisations in the South-Western Flatlands NRM Cluster, with support from Stream 2 representatives. The Working Group ensured collaboration for strategic cross-regional consideration of planning for climate change impacts and adaptation across NRM Regions. Regular meetings, workshops, emails and a drop box enabled sharing of information, review of strategic project direction, improved efficiency, collaboration on project challenges, and development of innovative project ideas.
8. **Extensive stakeholder consultation and engagement:** NRM organisations consulted widely with technical experts, community groups, Local Government, State Government agencies, interest groups, regional Landcare groups, landholders, the Aboriginal community and production-focused groups to increase communities' understanding of climate change, involve them in risk assessment, use their expertise to review and comment on the strategic planning aspects of the project, and provide information that was then used in the MCAS-s modelling.
9. **Successful promotion of project achievements:** promotion of the project success at a number of events, including the NCARFF Conferences (2014 and 2016), the Stream 2 Workshop in Sydney (2015), the WA State NRM Conference in Mandurah (2015) and the Species on the Move International Conference in Hobart (2016).

## **SPECIFIC REGIONAL OUTCOMES FOR WESTERN AUSTRALIA**

### **South West Catchments Council (SWCC)**

An asset-based approach was utilised to develop regional strategies in the past, but for this project, a newly-developed systems-based approach was tested.

Community workshops were held at 14 sites across the region to determine local priorities and expectations. One-on-one interviews were also conducted with Indigenous leaders, as this was their

preferred method of providing information. The information gathered was then used to inform an update of the 2012-20 Regional NRM strategy.

The original format of a static document has now been replaced by an interactive website (<http://www.swnrmstrategy.org.au/>) that allows users to provide information and updates online and also gives them the opportunity to map their “story”. This means that the online strategy is now a living document that is updated to incorporate new data and climate information, as and when it becomes available.

Documents produced include:

- Project Planning Matrices and Flow diagrams for all six key asset classes;
- Final Report of South West Catchments Council Community Engagement (March – June 2014);
- Final Report of South West Catchments Council Aboriginal Community Engagement (2014);
- A Regional NRM Planning for Climate Change Draft Project Scoping Paper (2014);
- SWCC Biosequestration Project Report (2014);
- SWCC Projected Climate Change Impacts for SWCC – Discussion of Rainfall & Temperature Change in Relation to SWCC Assets. Ecotones & Assoc (Revised & Updated May 2015);
- SWCC Bio-Climatic Projections & Landscape Linkages Review. Ecotones & Assoc (November 2014);
- CCF Climate Change Project Review - Key Findings (June 2015);
- Cook, B. A., Ford, B. M., Van Helden, B., Beatty, S. J., Ogston, G., Close, P. G. (2015). Development and application of a framework for assessing the vulnerability of aquatic species to multiple threats. Report No CENRM 140. Centre of Excellence in Natural Resource Management, University of Western Australia.
- Incorporating projected trends of a changing climate into community-based regional-scale Natural Resource Management planning (Feb 2016) – Poster presentation @ Species on the Move conference, Hobart, Tasmania.

## South Coast NRM

South Coast NRM updated the regional strategy *Southern Prospects 2011-2016* to plan for climate change. The *Climate Adaptation Addendum* supports the existing NRM strategy and identifies key adaptive strategies to ensure that South Coast NRM address and incorporate climate science and scenarios to plan for the impacts of climate change. The *Climate Adaptation Addendum* reviews the threats of a changing climate on the natural resources of our region including the impacts on coastal and marine, land, biodiversity, water and cultural heritage assets. It also examines the capacity of our community to adapt.

The *Climate Adaptation Addendum* draws on a series of background papers prepared for South Coast NRM on the themes in *Southern Prospects*. Using the background papers, South Coast NRM’s reference groups assisted in incorporating climate planning strategies into the existing program logic process used in *Southern Prospects 2011-2016*. The *Climate Adaptation Addendum* was used as the basis for developing and prioritising climate related activities and projects in the South Coast NRM’s investment planning process. This has allowed more detailed targets on how specific outcomes and goals will be met and identified key priorities for investment in the future.

A technical working group undertook a facilitated process using the tool Multi-criterion Analysis Shell for Spatial Decision Support (MCAS-s) developed by the Australian Bureau of Agricultural and Resource Economics (ABARE). This participatory modelling tool encouraged stakeholder contribution through data verification, input on the framework and decision making criteria. Spatial data layers were sourced through state agencies, the Centre for Excellence in Natural Resource

Management (CENRM) at the University of Western Australia and additional resources. Two major climate conferences held in the region attracted over 200 people highlighting the importance of climate change to the community.

All reports and the GIS Platform are available on the web site [www.climateactionfarming.com.au](http://www.climateactionfarming.com.au).

- South Coast NRM (2016) *Climate Adaption Addendum to Southern Prospects 2011 – 2016*. South Coast Region of Western Australia. South Coast NRM Inc.
- Duxbury, L., D and N Burford (2014) *Climate Change Adaptation and Cultural Heritage South Coast Region of Western Australia*. South Coast NRM Inc. and Greenskills
- *Climate Change Adaptation and Coastal and Marine South Coast Region of Western Australia*. South Coast NRM Inc.
- Gunby, C. 2014 *Climate Change Adaptation and Water, South Coast Region of Western Australia*. South Coast NRM Inc.
- Fry, J.M. 2014 *Climate Change Adaptation and Land, South Coast Region of Western Australia*. South Coast NRM Inc. Albany
- Gilfillan, S. 2014 *Climate Change Adaptation and Biodiversity, South Coast Region Western Australia*. South Coast NRM Inc.
- Duxbury, L and Hodgson, N. 2014 *Climate Change Adaptation and Socio-Economic Dimensions South Coast Region Western Australia*. South Coast NRM
- Ecotones and Associates (2015) *Climate Change Impacts South Coast NRM Region – using MCAS to evaluate key biodiversity assets at risk of climate change*. South Coast NRM Inc. (internal only)
- Ecotones and Associates (2014) *Biodiversity Prioritisation and Biosequestration Modelling and Analysis*, South Coast NRM Inc.

## NACC

NACC used this project as a catalyst to review its entire Regional NRM strategy and present it in a digital format. The updated strategy, *NARvis* or the Northern Agricultural Regional Vision, can be viewed online at [www.narvis.com.au](http://www.narvis.com.au)

Priority landscapes for carbon plantings were identified throughout the Northern Agricultural Region (NAR). The identification process used the Multi Criteria Analysis Shell for Spatial Decision Support (MCAS-S) software and involved a number of agency, subject matter experts and community members to model priority landscapes of carbon planting. Output maps and data from this process are a legacy tool for NACC, which has been further utilised to develop NACC's Biodiversity Program and Strategy.

NACC also contracted CENRM to undertake additional modelling to look at changes in plant species ranges under different climate change scenarios to aid reforestation and the creation of biodiversity corridors in the NAR. This modelling will help individuals and groups when planning revegetation works to plant species that will persist in a changing climate.

Community engagement throughout this project has led to an increased understanding of climate change in the region, with 61% of survey respondents from our Productive Farming Future Forum - *Agriculture in a Changing Climate* (held in Coorow in February 2016) already undertaking climate adaptation practices on their properties.

## Outcomes

- Creation of NARvis, the Northern Agricultural Regional Vision website and online strategy [www.narvis.com.au](http://www.narvis.com.au) and summary document.
- Update of regional NRM goals and strategies <http://www.narvis.com.au/targets-regional-aspirations/>.
- Prioritisation of areas for carbon planting both within the NAR and standardisation of the mapping outputs to allow them to be comparable with the other NRM groups within the cluster.
- Creation of two community engagement outcomes reports highlighting community priorities and climate change concerns.
- Biodiversity Prioritisation and Analysis informing NACC's Biodiversity Program and Strategy.
- Species modelling under a changing climate.
- Productive Farming Futures Forum, *Agriculture in a Changing Climate*: a community forum about the impacts of climate change on agriculture. As a direct result of attending the forum, 44% of survey respondents were planning to implement adaptation practices on their property.
- NARvis: taking Natural Resource Management into the cloud, presentation at WALIS Forum 2013 and WA State NRM Conference 2015.
- Incorporating Climate Change into NRM, presentation at WA State NRM Conference 2015.
- Incorporation of key planning for climate change principles into future organisational and program level strategic planning processes.

## **Wheatbelt NRM**

In the Avon NRM Region, Wheatbelt NRM has used the NRM Planning for Climate Change project to further develop the Avon/Wheatbelt NRM Regional Strategy, create an NRM Dashboard for tracking environmental change, map priorities for carbon plantings to maximise NRM outcomes and improve access to maps and information describing the climate change and its impact on biodiversity and agriculture in the region.

The updated NRM strategy for the Avon region -see <http://www.wheatbeltnrm.org.au/nrmstrategy> consists of a 7 page document that provides a snap shot of the Avon River Basin, describes the key aspects of resilience and adaptive management, presents a regional ecosystem services model, and outlines the 20-30 year objective & vision, as well as 5 year priorities. The strategy was subject to extensive community/stakeholder consultation, with thresholds of potential concern (TPC) and 5-year strategic objectives emerging from this process. This has resulted in a logical, comprehensive and transparent strategic plan that captures the complexity of the socio-economic system, but by using a resilience approach translates these into clear and simple thresholds of potential concern and objectives that will guide NRM activity in the region.

The NRM strategy for the Avon/Wheatbelt NRM region can be found at <http://wheatbeltstrategy.com.au/>. This includes information from the NRM strategy document, the systems based analysis of the region and key NRM Planning for Climate Change project tools including NRM Dashboard, carbon planning tool, and climate change portal.

The NRM Dashboard provides simple infographic representation of how the region is fairing against the Thresholds of Potential Concern, and also includes secondary indicators of processes driving change. This has been developed using data from private and public sectors, resulting in a dashboard that involves no new monitoring and values the contribution of key stakeholders to our collective understanding of NRM in the region. The dashboard will be updated going forward based on data

availability and the rate of change associated with each variable (eg slow or fast moving) and forms a fundamental component of embedding an adaptive management approach to NRM in the region.

The Carbon Planning Tool provides access for the user community to the carbon prioritisation mapping through an interactive mapping interface (developed using ArcGIS Online). The tool also provides access to the recommendations for carbon plantings developed through the project and associated with the user's proposed planting area.

An on-line portal for climate change information relating to the Avon NRM Region has been completed and can also be accessed through the Wheatbelt NRM [Strategy website](#). It presents a series of 33 interactive maps prepared to show-case the current and projected state of the regional climate and how changes may impact on biodiversity and agricultural production.

An analysis of the current policy environment affecting NRM has been completed in this project, and a summary infographic developed to assist when communicating with key stakeholders on NRM issues and opportunities in the region.

## **Perth NRM**

Perth NRM used this project as a catalyst to review and update its entire Regional NRM Strategy. This project also offered the opportunity to move from an asset based approach to an integrated planning framework for the management of the Swan Region's natural resources.

As a whole-of-region, multi-stakeholder document, the Swan Region Strategy for NRM is built on the foundation of partnerships and collaboration and acknowledges that everyone that lives or works in the Region is an environmental custodian. The updated Strategy is a web-based document, and includes a portal for climate change information which can be found at the [Swan Region Strategy website](#).

The Strategy uses a program logic approach where key issues are linked with priorities and actions for each action area in the Strategy. It defines the strategic priorities for each action area, linked to long-term goals. It is supported by a Monitoring Evaluation Reporting and Improvement Plan and an Implementation Plan that defines the one to three year priorities. The implementation Plan also identifies the relevant roles and responsibilities of different stakeholders, with the role of PNRM in the Implementation Plan varying depending on capacity, ranging from 'leader', 'partner' or 'coordinator'.

The Swan NRM Committee and a Planning for Climate Change Working Group were established to enable a collaborative and transparent approach to NRM planning. The Swan NRM Committee provides high-level oversight and input into development and implementation of the Strategy. This Committee consists of approximately twenty-five key stakeholder groups including state government, WA Local Government Association, Sub-Regional NRM Groups, universities and business and industry groups. The Swan NRM Committee was formed in December 2013 and has met quarterly since that time. The PCC Working Group reported to the Swan NRM Committee and met monthly from April 2014 to September 2014, providing technical advice and assist with the planning process.

To deliver the Planning for Climate Change project, a two staged planning process was undertaken including:

- 1) A climate change risk assessment for the Swan Region, and
- 2) Spatial analysis using the Multi-Criteria Assessment Shell for Spatial Decision Support (MCAS-S).

The first stage involved a climate change risk assessment for the Swan region. This risk assessment provided a structured, systematic and comprehensive process for identifying opportunities to maximise adaptive capacity in the landscape. The risk assessment:

- Identified the risks that climate change posed to the assets of the Swan region
- Identified the threatening processes which drive the risks
- Prioritised each risk based on the likelihood of that risk occurring and the severity of that risk, and
- Identified a set of management actions to mitigate, ameliorate or prevent that risk.

The second stage of the planning process involved establishment of a series of expert panels to undertake spatial analysis to answer key climate change questions for the region using the GIS based Multi Criteria Analysis Shell for Spatial Decision Support (MCAS-S).

The three themes for the MCAS-S analysis used were:

1. Identification of priority landscapes for carbon plantings,
2. Strategies to build landscape integrity, and
3. Strategies to guide adaptation and mitigation actions to address climate change impacts on natural ecosystems and agriculture.

The expert panels who undertook the MCAS-S analysis included representation from government, industry, community and research institutions and used a collaborative approach to explore each of these themes using the interactive MCAS-S analysis tool. Overall, more than 170 people from 80 organisations have been involved in the update of the Swan Region Strategy between 2013 and 2014.

The MCAS-S analysis involved a series of three expert panel workshops for each theme, which were held with stakeholders in July and August 2014. These workshops developed a series of maps that inform implementation of the Swan Region Strategy. The maps also identify ways to link carbon sequestration projects with landscape connectivity, resilience and wildlife corridors.

The maps have been used to develop PNRM programs and projects aimed at building landscape resilience in the Swan Region including the PNRM Living Landscapes and Living Wetlands Programs. These Programs aim to protect high value natural assets whilst increasing ecological resilience and connectivity within the Swan Region. Community grants totalling \$720,000 over three years have been made available, with these programs delivering on three key priorities in the Strategy.

For more information about the outcomes of these projects, go to the NRM WA Regional web page to find your region @ <http://www.nrmwa.org.au/nrmwa-regions>