Case Study

Embedding Climate Adaptation in Agriculture in North East Victoria

The Embedding Climate Adaptation in Agriculture in North East Victoria (ECAiA) Project aimed to assist the agricultural sector and local government to effectively adapt to the impacts of climate change.

Supported by funding from the Australian Government's National Landcare Program, the project utilised existing, readily available data of relevance to an assessment of climate change impacts on agricultural productivity at the regional scale. Data and information, supplemented by local knowledge was synthesised, analysed and presented to make it easy for end users to integrate information, develop knowledge of how climate change impacts their businesses and operations, and plan and manage for the future.

A core component of the project from the outset was to design and develop a suite of tools, including the Climate Explorer and Water Balance Explorer. These were designed to support discussion around managing impacts of climate change and to equip the agribusiness sector and local governments in North East Victoria with tools and knowledge 'resources' to articulate the likely impacts of climate change on the dominant agricultural sectors.

> "Spatial Vision have been part of a multidisciplinary team that comprised of a range of skills to deliver a novel and innovative solution to identifying and communicating the modelled outlook for climate change in North East Victoria and how that might affect agricultural industry sectors, and local government."
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> **Lachlan Campbell**
> **Catchment Coordinator Regional Agricultural Landcare Facilitator**
> **North East Catchment Management Authority**

Customer Profile
www.necma.vic.gov.au

Company
North East Catchment Management Authority

Location
Victoria

Industry
Catchment Management

Products
GIS Analysis and Arc GIS Enterprise Web Mapping Tool

Solution
A set of web-based spatial tools were developed to report impacts of climate change and the critical factors which will impact on the performance of six agricultural sectors under current and projected climate change. Information presented included the results of agreed modelling showing the impact in terms of commodity productivity.

Benefits
- Increased capacity of agriculture systems, related communities and local government to adapt to significant changes in regional climatic conditions
- Regionally specific climatic data available for six agricultural industries to support strategic planning for agriculture

The Issue

Australian agriculture is at a pivotal point in its history with a confluence of a number of powerful drivers of change. These, aside from a rapidly changing climate, include new markets and trade arrangements, socio-demographic transformations and competition for natural resources including land and water. It is against this turbulent context that the agriculture sector in climate-exposed regions, like the North-East Catchment in Victoria, must meet challenges of ensuring long-term sustainability.

Presently, there are limited avenues for effective visualisation and interaction with climate change information, water balance considerations and agricultural production predictions for a given sector. Interactive web mapping applications can form effective means of communication and provide support for appropriate decision-making. However, for most regions, these tools and decision support systems are limited or do not exist at all.

The Solution

Successful visualisation requires use of new and engaging techniques, utilising modern and emerging visualisation approaches. Additionally, effective tools must be built using pertinent software architecture.

For the North East CMA, in-house ArcGIS Online architecture was employed to implement and host the Spatial Explorers as web applications. Tools were published as a series of ArcGIS web services that would in turn be consumed by the web applications, one for each agricultural sector and climatic element. This incorporated a series of available widgets such as filtering and customised toolkits allowing users to graph differences between three timeframes for the same climatic factors or agricultural commodities. This included focuses on temperatures, heat waves, rainfall and water balance issues.

The foundation of climate and agricultural data visualisation is, of course, the data. Current climate information was obtained through the SILO data repository and climate change data was sourced from the CSIRO for an appropriate Global Climate Change Model and emissions scenario. Both were furnished at a 5km2 grid for the region. Agricultural production and water balance were modelled through the Catchment Analysis Toolkit and validated through a series of workshops with local producers and relevant industry bodies.

This allowed for relevant climate parameters, contextual information and productivity performance based metrics relating to anticipated climate impacts to commodities to be customised for each agricultural sector.

The Benefits

The Climate, Water Balance and Agricultural Production Explorers developed and applied supported;

- ✓ Increased capacity of agriculture systems, related communities and council to adapt to significant changes in regional climatic conditions.

- ✓ Increased knowledge and awareness of climate change scenarios and effects on agricultural enterprises.

- ✓ Ability of land managers and councils to have regionally specific climatic data available supporting strategic planning.

Information presented included results of agreed modelling showing impacts in terms of productivity for the;

- ✓ Dominant commodities for six agricultural sectors.

- ✓ Current climate and anticipated climate change in terms of critical factors which will impact on performance of dominant agricultural commodities.

Our data visualisation tools assisted agricultural and government sectors in planning and preparing for the impacts of climate change.

If you'd like to know more, please get in touch.