LOOC-C, a conversation starter

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* In collaboration with CSIRO Agriculture & Food, Land & Water, Data61 and stakeholders throughout the land sector

What is happening?

Digiscape Carbon ‘How might we promote carbon farming?’

Agri-Technology

Climate policy and national strategy

Science capability and data driven insights

Farming business strategy, short and long-term

https://research.csiro.au/digiscape/

Images provided by Noun Project

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Agri-Technology

Regulated Projects

Climate policy and national strategy

Biophysical models /data analytics

Science capability and data driven insights

Farming in a changing climate

Farming business strategy, short and long-term

https://research.csiro.au/digiscape/

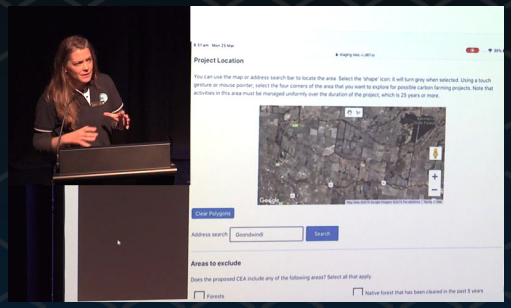
Images provided by Noun Project

Our approach…

- Co design with various stakeholders and focus on problem to-be-solved
- Support individual's discovery and evaluation of ERF options
- Use 'digital' to start conversation between landholders, advisors, and project managers

We've been active with land sector and industry groups

- Involving farmers, land managers, and advisors in product development
- Team presence at industry events: active in the conversation



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How to use LOOC C

https://looc-c.farm/

Discover Projects

Select a region to investigate and answer a few questions about how the land is used

Get Estimates

Click on cards for any method that you want to learn more about

Assess Options

Save as PDF or contact others for more information

Launch expected Dec 2019. It's free.

What to expect from LOOC C V01

https://looc-c.farm/

Video

Discover Projects

V01: model-based soil carbon and vegetation management

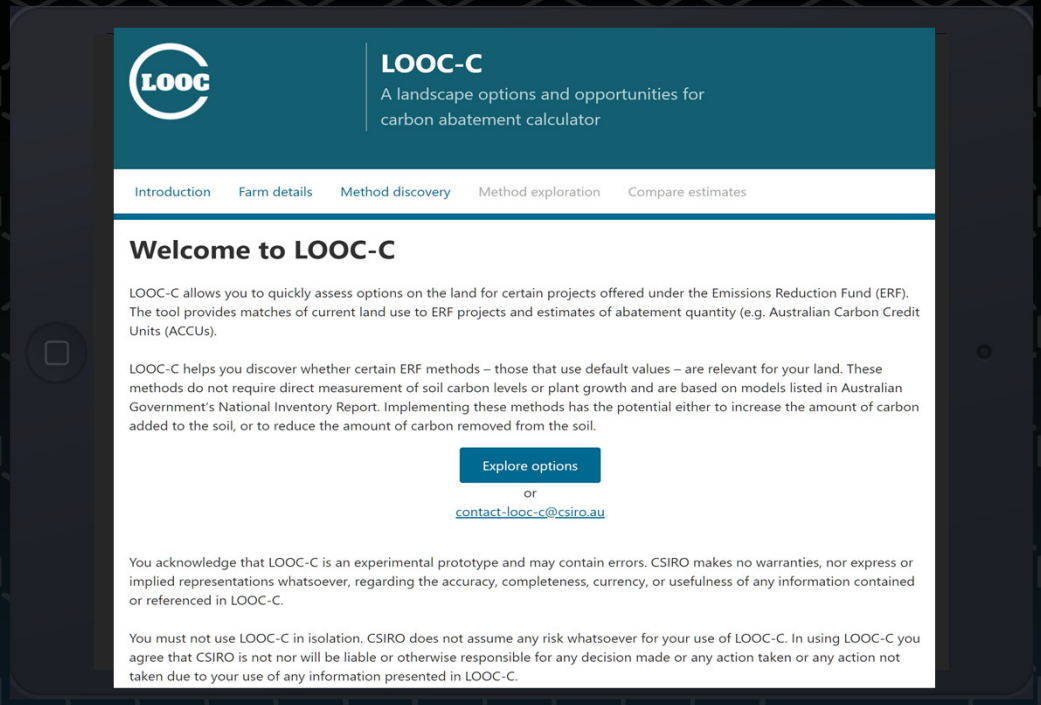
Get Estimates

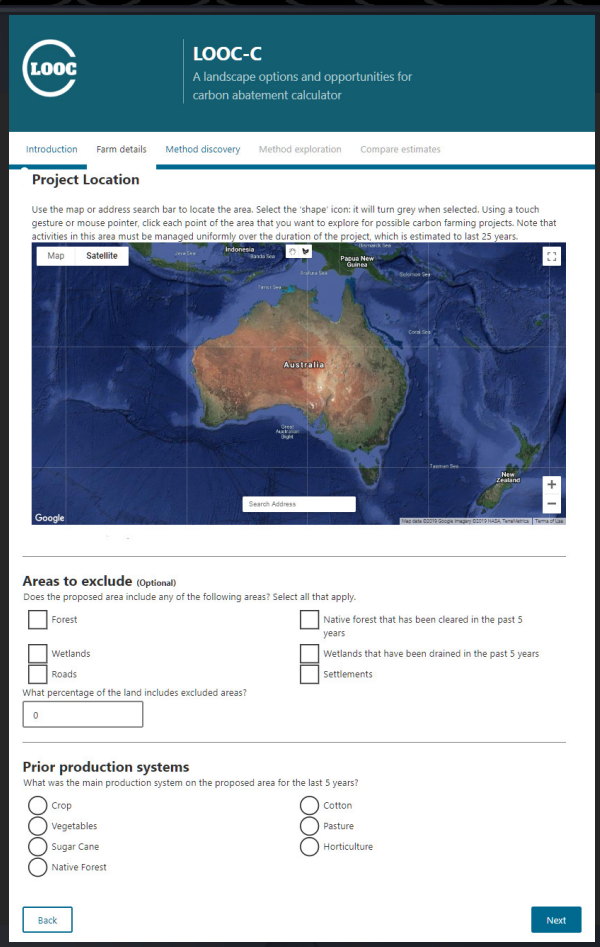
V01: potential carbon credits based on default approaches and co benefits associated with land management activity

Assess Options

V01: Farm-first experience, all possible options, and next steps

Launch expected Dec 2019. It's free.


LOOC-C
A landscape options and opportunities for carbon abatement calculator
Introduction
Farm details
Method discovery
Method exploration
Compare estimates
Welcome to LOOC-C
LOOC-C allows you to quickly assess options on the land for certain projects offered under the Emissions Reduction Fund (ERF). The tool provides matches of current land use to ERF projects and estimates of abatement quantity (e.g. Australian Carbon Credit Units (ACCUs).
LOOC-C helps you discover whether certain ERF methods – those that use default values – are relevant for your land. These methods do not require direct measurement of soil carbon levels or plant growth and are based on models listed in Australian Government's National Inventory Report. Implementing these methods has the potential either to increase the amount of carbon added to the soil, or to reduce the amount of carbon removed from the soil.
Explore options
or
contact-looc-c@csiro.au
You acknowledge that LOOC-C is an experimental prototype and may contain errors. CSIRO makes no warranties, nor express or implied representations whatsoever, regarding the accuracy, completeness, currency, or usefulness of any information contained or referenced in LOOC-C.
You must not use LOOC-C in isolation. CSIRO does not assume any risk whatsoever for your use of LOOC-C. In using LOOC-C you agree that CSIRO is not nor will be liable or otherwise responsible for any decision made or any action taken or any action not taken due to your use of any information presented in LOOC-C.


LOOC-C
A landscape options and opportunities for carbon abatement calculator
Introduction
Farm details
Method discovery
Method exploration
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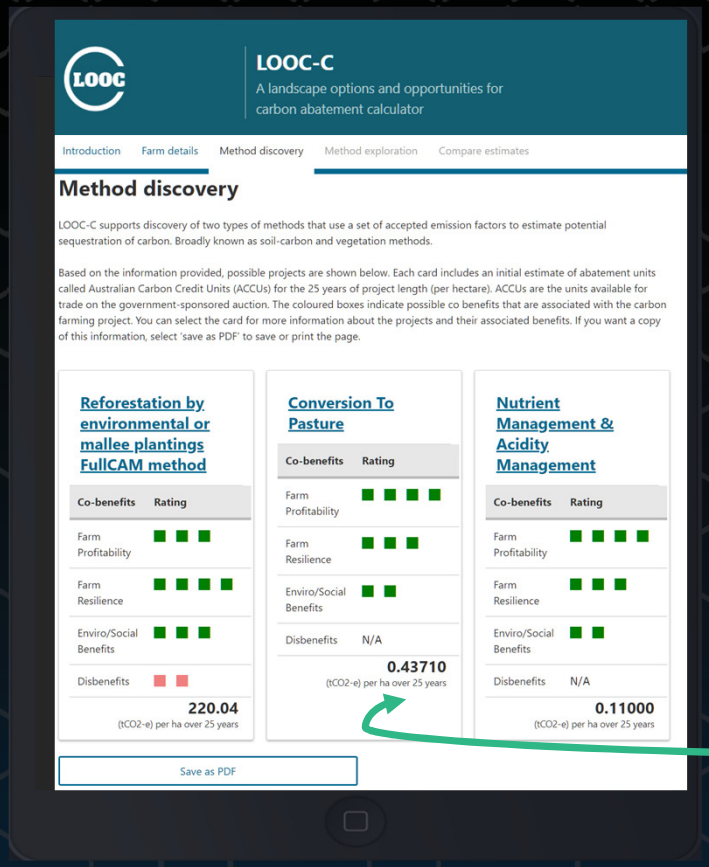
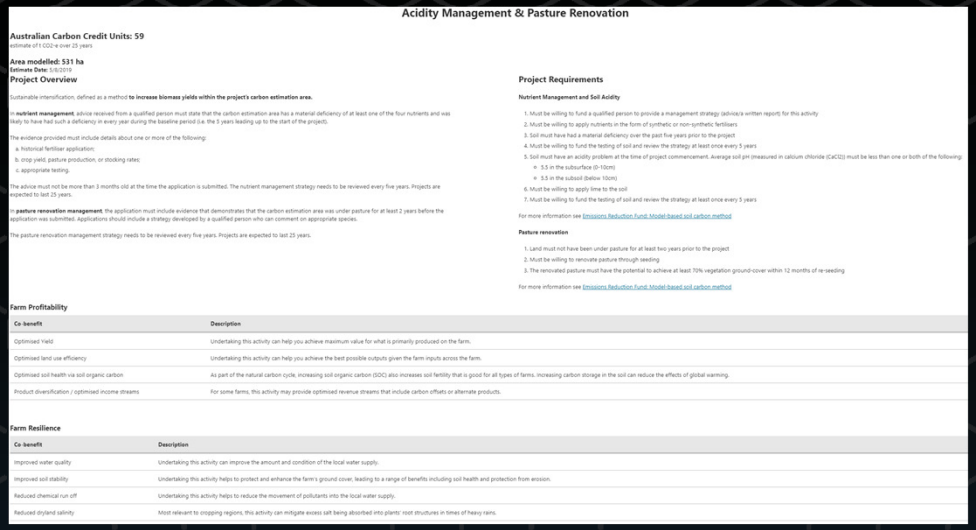
Project Location
Use the map or address search bar to locate the area. Select the 'shape' icon: it will turn grey when selected. Using a touch gesture or mouse pointer, click each point of the area that you want to explore for possible carbon farming projects. Note that activities in this area must be managed uniformly over the duration of the project, which is estimated to last 25 years.
Map
Satellite
Indonesia
Papua New Guinea
Australia
New Zealand
Search Address
Google
Areas to exclude (Optional)
Does the proposed area include any of the following areas? Select all that apply.
Forest
Native forest that has been cleared in the past 5 years
Wetlands
Wetlands that have been drained in the past 5 years
Roads
Settlements
What percentage of the land includes excluded areas?
0
Prior production systems
What was the main production system on the proposed area for the last 5 years?
Crop
Cotton
Vegetables
Pasture
Sugar Cane
Horticulture
Native Forest
Back
Next



Discover Projects

Get Estimates



Acidity Management & Pasture Renovation

Australian Carbon Credit Units: 59

estimate of t CO2-e over 25 years

Area modelled: 531 ha

Estimate Date: 5/8/2019

Project Overview

Sustainable intensification, defined as a method **to increase biomass yields within the project's carbon estimation area.**

In **nutrient management**, advice received from a qualified person must state that the carbon estimation area has a material deficiency of at least one of the four nutrients and was likely to have had such a deficiency in every year during the baseline period (i.e. the 5 years leading up to the start of the project).

The evidence provided must include details about one or more of the following:

a. historical fertiliser application;

b. crop yield, pasture production, or stocking rates;

c. appropriate testing.

The advice must not be more than 3 months old at the time the application is submitted. The nutrient management strategy needs to be reviewed every five years. Projects are expected to last 25 years.

In **pasture renovation management**, the application must include evidence that demonstrates that the carbon estimation area was under pasture for at least 2 years before the application was submitted. Applications should include a strategy developed by a qualified person who can comment on appropriate species.

The pasture renovation management strategy needs to be reviewed every five years. Projects are expected to last 25 years.

Project Requirements

Nutrient Management and Soil Acidity

1. Must be willing to fund a qualified person to provide a management strategy (advice/a written report) for this activity
2. Must be willing to apply nutrients in the form of synthetic or non-synthetic fertilisers
3. Soil must have had a material deficiency over the past five years prior to the project
4. Must be willing to fund the testing of soil and review the strategy at least once every 5 years
5. Soil must have an acidity problem at the time of project commencement. Average soil pH (measured in calcium chloride ($CaCl_2$)) must be less than one or both of the following:
   - 5.5 in the subsurface (0-10cm)
   - 5.5 in the subsoil (below 10cm)
6. Must be willing to apply lime to the soil
7. Must be willing to fund the testing of soil and review the strategy at least once every 5 years

For more information see Emissions Reduction Fund: Model-based soil carbon method

Pasture renovation

1. Land must not have been under pasture for at least two years prior to the project
2. Must be willing to renovate pasture through seeding
3. The renovated pasture must have the potential to achieve at least 70% vegetation ground-cover within 12 months of re-seeding

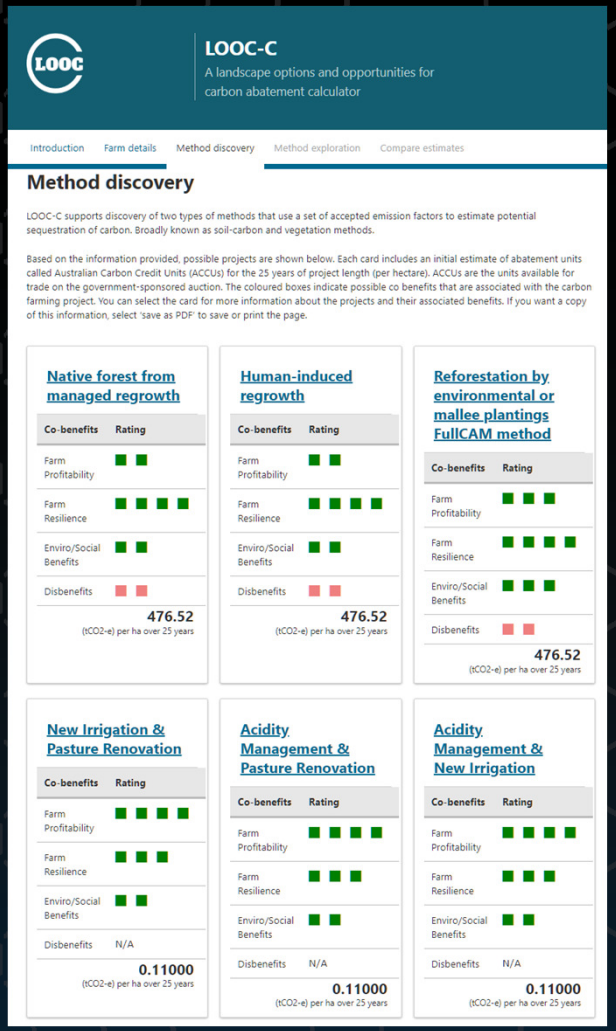
For more information see Emissions Reduction Fund: Model-based soil carbon method

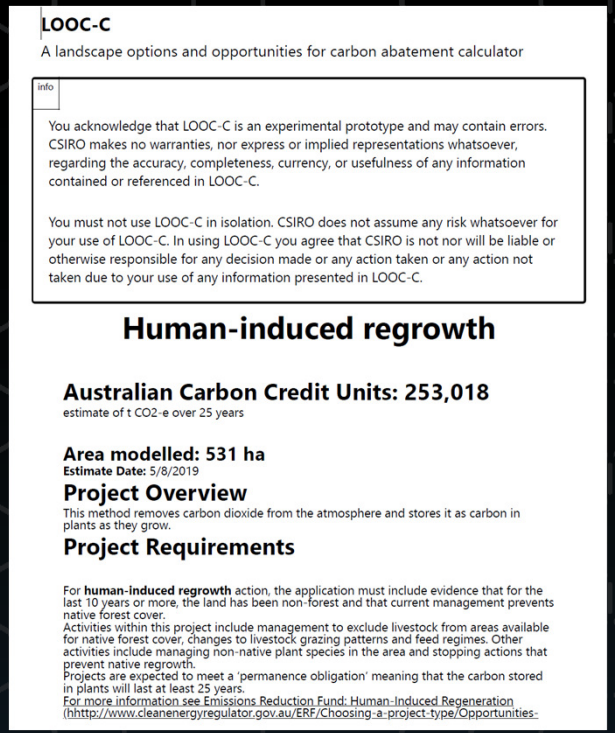
Farm Profitability

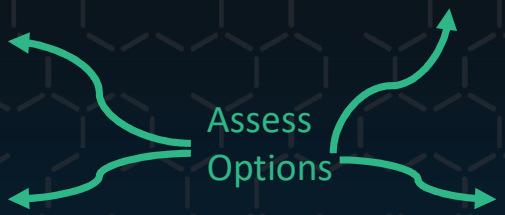
Co-benefit	Description
Optimised Yield	Undertaking this activity can help you achieve maximum value for what is primarily produced on the farm.
Optimised land use efficiency	Undertaking this activity can help you achieve the best possible outputs given the farm inputs across the farm.
Optimised soil health via soil organic carbon	As part of the natural carbon cycle, increasing soil organic carbon (SOC) also increases soil fertility that is good for all types of farms. Increasing carbon storage in the soil can reduce the effects of global warming.
Product diversification / optimised income streams	For some farms, this activity may provide optimised revenue streams that include carbon offsets or alternate products.

Farm Resilience

Co-benefit	Description
Improved water quality	Undertaking this activity can improve the amount and condition of the local water supply.
Improved soil stability	Undertaking this activity helps to protect and enhance the farm's ground cover, leading to a range of benefits including soil health and protection from erosion.
Reduced chemical run off	Undertaking this activity helps to reduce the movement of pollutants into the local water supply.
Reduced dryland salinity	Most relevant to cropping regions, this activity can mitigate excess salt being absorbed into plants' root structures in times of heavy rains.







Farm Profitability

Co-benefit	Description	Rating
Optimised Yield	Undertaking this activity can help you achieve maximum value for what is primarily produced on the farm.	None
Optimised land use efficiency	Undertaking this activity can help you achieve the best possible outputs given the farm inputs across the farm.	Slight
Optimised soil health via soil organic carbon	As part of the natural carbon cycle, increasing soil organic carbon (SOC) also increases soil fertility that is good for all types of farms. Increasing carbon storage in the soil can reduce the effects of global warming.	None
Product diversification / optimised income streams	For some farms, this activity may provide optimised revenue streams that include carbon offsets or alternate products.	Strong

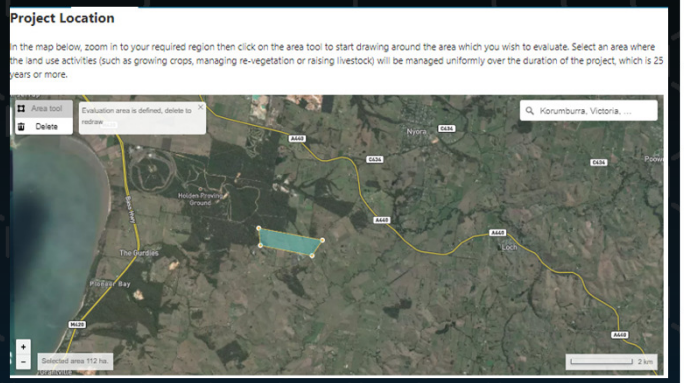
Case 1: Loch and pasture (112ha)

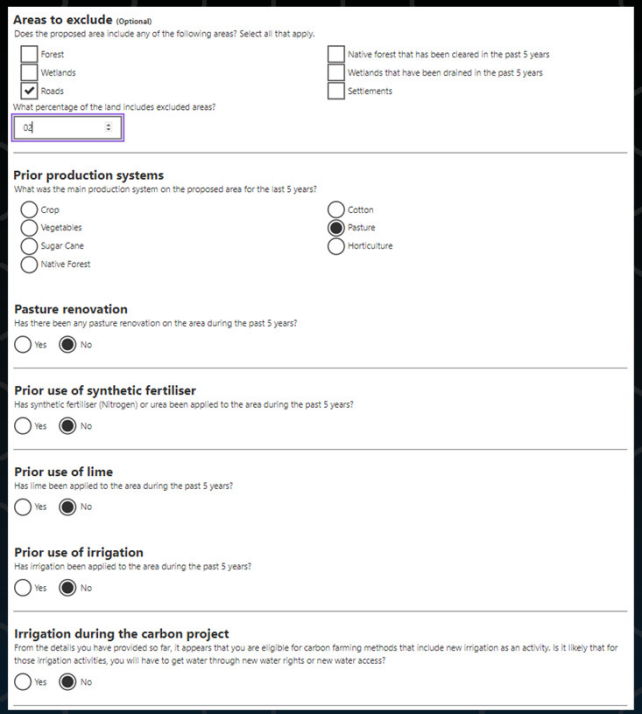
Jacinta Van Stekelenburg Case Study.

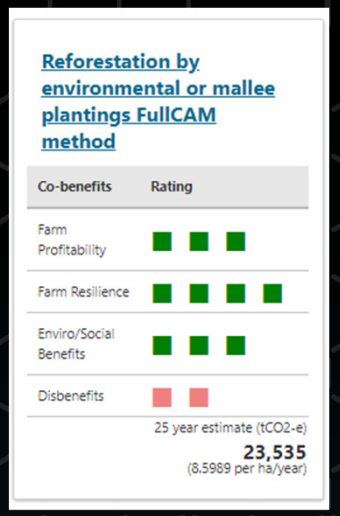
https://goo.gl/maps/kXkGLGHD1gHi49AZ8

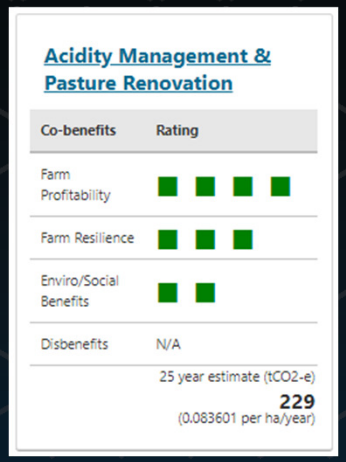
Address- 496 Loch Kernot Road, Loch 3945

Enterprise type/production system- Small scale regenerative agriculture mixed farming. Beef, chickens, fruit trees and vegetables.









Case 2: Surf Beach and Pasture (143 ha)

Bill Cleeland Case Study.

https://goo.gl/maps/99KGWorSfUQye4H7A

Address- 1510 Phillip Island Rd, Surf Beach VIC 3922

Enterprise type/production system- beef and sheep (meat and wool)

Project Location

In the map below, zoom in to your required region then click on the area tool to start drawing around the area which you wish to evaluate. Select an area where the land use activities (such as growing crops, managing re-vegetation or raising livestock) will be managed uniformly over the duration of the project, which is 25 years or more.

Method discovery

LOOC-C supports discovery of two types of methods that use a set of accepted emission factors to estimate potential sequestration of carbon. Broadly known as soil-carbon and vegetation methods.

Based on the information provided, possible projects are shown below. Each card includes an estimate of total abatement units called Australian Carbon Credit Units (ACCUs) for the 25 years of project length. ACCUs are the units available for trade on the government-sponsored auction. The coloured boxes indicate possible co benefits that are associated with the carbon farming project. You can select the card for more information about the projects and their associated benefits. If you want a copy of this information, select 'save as PDF' to save or print the page.

Farm details

- Prior production systems: *Pasture*
- Pasture renovation? *No*
- Prior use of irrigation? *No*
- Prior use of synthetic fertiliser? *No*
- Prior use of lime? *No*
  - Irrigation during the carbon project? *No*

Available methods

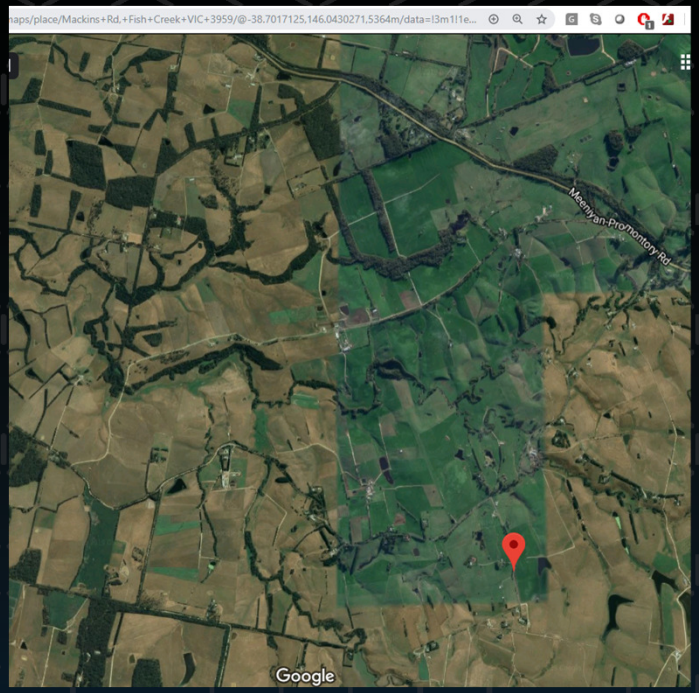
Case 3: Fish Creek (341 ha)

Amber Creek Farm Case Study.

https://goo.gl/m/qHJp6PaqCXszvSzR7

Address- 155 Mackins Road, Fish Creek, 3959

Enterprise type/production system- pasture free range pigs, agroforestry and sawmilling



Native forest from managed regrowth

Co-benefits	Rating
Farm Profitability	■ ■
Farm Resilience	■ ■ ■ ■
Enviro/Social Benefits	■ ■
Disbenefits	■ ■

25 year estimate (tCO2-e)
73,612
(8.6583 per ha/year)

Human-induced regrowth

Co-benefits	Rating
Farm Profitability	■ ■
Farm Resilience	■ ■ ■ ■
Enviro/Social Benefits	■ ■
Disbenefits	■ ■

25 year estimate (tCO2-e)
73,612
(8.6583 per ha/year)

Reforestation by environmental or mallee plantings FullCAM method

Co-benefits	Rating
Farm Profitability	■ ■ ■
Farm Resilience	■ ■ ■ ■
Enviro/Social Benefits	■ ■ ■
Disbenefits	■ ■

25 year estimate (tCO2-e)
73,612
(8.6583 per ha/year)

Acidity Management & Pasture Renovation

Co-benefits	Rating
Farm Profitability	■ ■ ■ ■
Farm Resilience	■ ■ ■
Enviro/Social Benefits	■ ■
Disbenefits	N/A

25 year estimate (tCO2-e)
711
(0.083601 per ha/year)

Nutrient Management & Pasture Renovation

Co-benefits	Rating
Farm Profitability	■ ■ ■ ■
Farm Resilience	■ ■ ■
Enviro/Social Benefits	■ ■
Disbenefits	N/A

25 year estimate (tCO2-e)
711
(0.083601 per ha/year)

Nutrient Management & Acidity Management

Co-benefits	Rating
Farm Profitability	■ ■ ■ ■
Farm Resilience	■ ■ ■
Enviro/Social Benefits	■ ■
Disbenefits	N/A

25 year estimate (tCO2-e)
711
(0.083601 per ha/year)

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Case 4: Malabar

Jenny O'Sullivan (Malabar Farm Case Study).

https://goo.gl/maps/cCtknpmcHZ5v1rmb6

Address- 1720 Buffalo-Waratah Rd, Tarwin Lower VIC 3956

Enterprise type/production system- beef and sheep

The Digiscape Carbon Team

- **Peter Fitch,** project leader extraordinaire
- **Jeff Baldock and Stephen Roxburgh**, soil and tree gurus
- **Cara Stitzlein and Martijn Mooij,** the ‘people’ people
- **Andrew Reeson**, market ninja
- **Alex Bunday,** product mission specialist
- Building and testing provided by Data 61

https://looc-c.farm/

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CSIRO
DATA 61
THANK YOU
Data61 / Analytics & Decision Sciences
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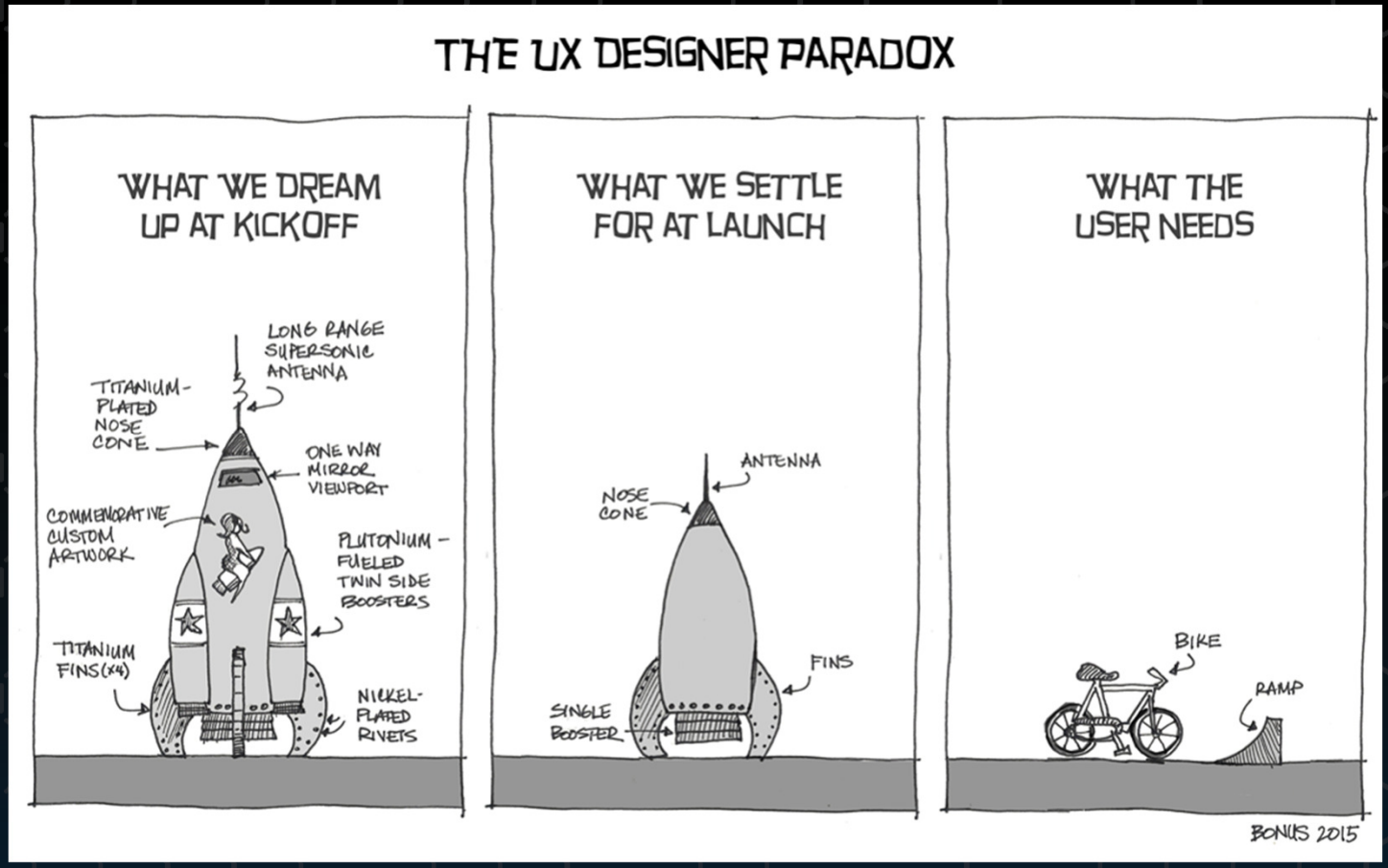
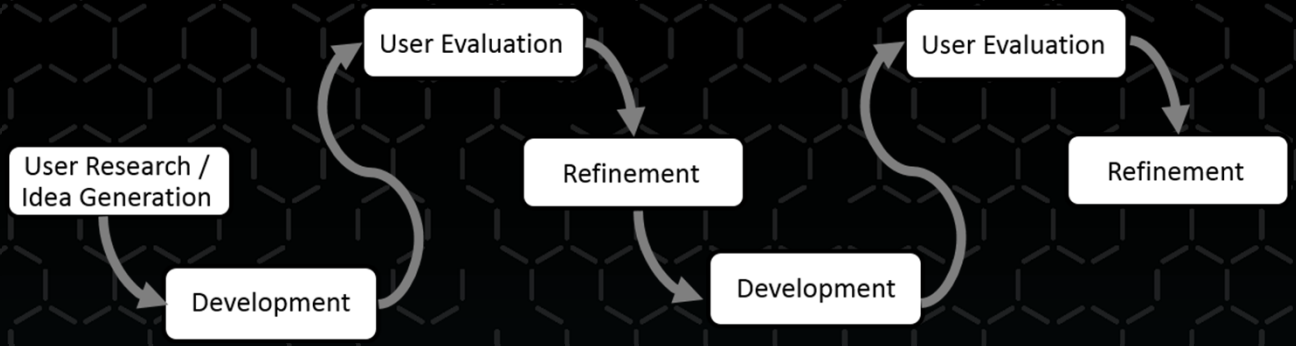
www.data61.csiro.au

Resources

- V01: https://looc-c.farm/
- Video: https://csiroau-my.sharepoint.com/:v:/g/personal/sti093_csiro_au/ESfquRCtgH1MjQawn3PfTtMBkhxAwCRD4W4nTF2jGe9E4A?e=rrsl3t
- Benefits demo: https://projects.invisionapp.com/share/RVRURO6EFTN#/screens
- WoF demo: https://projects.invisionapp.com/share/ZHRURMG9VY8#/screens

- Project pages: https://research.csiro.au/digiscape/digiscapes-projects/digital-services-for-carbon-farming-markets/ and https://www.csiro.au/en/Research/AF/Areas/Digital-agriculture/New-opportunities/Carbon-farming-Digiscape


THE UX DESIGNER PARADOX
WHAT WE DREAM UP AT KICKOFF
LONG RANGE SUPERSONIC ANTENNA
TITANIUM-PLATED NOSE CONE
ONE WAY MIRROR VIEWPORT
COMMEMORATIVE CUSTOM ARTWORK
PLUTONIUM-FUELED TWIN SIDE BOOSTERS
TITANIUM FINS (x4)
NICKEL-PLATED RIVETS
WHAT WE SETTLE FOR AT LAUNCH
ANTENNA
NOSE CONE
FINS
SINGLE BOOSTER
WHAT THE USER NEEDS
BIKE
RAMP
BONUS 2015



Design Cycle 1: Invision Prototype

- Clickthrough functionality
- Test workflow and project discovery experience
- Results: acceptable workflow, more fidelity desired
- Refinement: implement subset of project types and filtering
- Value Proposition: tool for farmers

Design Cycle 2: Web-based Prototype

- Supports polygon selection, project discovery & exploration
- UX test results: acceptable workflow, insights are too weak, method exploration too onerous
- Refinement includes: replace table with interactive cards that include co benefits,implement more methods, remove detailed exploration from MVP.

V01 Release: MVP / MVE

- Basic workflow debugged
- 'Save as' feature debugged
- Next steps proposed