

# The value of our research



**LANDCARE RESEARCH**  
MANAAKI WENUA

# Thanks!

Programme Bids	Smart Ideas
Winning with Wildings	'Biosecure-ID': Machine learning to automate image-based species ID
Better management strategies for dairy farms	Wetland Assessment and Monitoring Tool: Pre-human baselines for assessing, monitoring and restoration
Building resilience and provenance into an authentic Maori honey industry	Optimal release strategies to maximise biological control: RHDV in rabbits
Security for iconic species: kiwi rescue	The "Achilles Heel" of pest control
Soil health: Oneone ora, tangata ora	
Next Generation S-map	

# Evaluate the value of LR science:

Across four sectors:

- Natural Resources Sector
- National Science Challenges
- Maori
- Primary Industries

How can we increase the impact of our research?



# NZ science globally

Country	Citation ranking	Number papers	Citation impact	Public / business R&D	Papers in top quartile journals
USA	1	3,295,715	1.28	103 / 134	63
China	2	1,484,687	0.86	-	-
Germany	3	768,106	1.33	156 / 137	77
England	4	809,977	1.42	80 / 90	134
France	5	525,509	1.30	115 / 112	79
Australia	9	396,563	1.36	132 / 101	135
<b>Denmark</b>	<b>18</b>	<b>111,966</b>	<b>1.64</b>	<b>169 / 134</b>	<b>183</b>
<b>Singapore</b>	<b>23</b>	<b>82,202</b>	<b>1.41</b>	-	-
<b>Israel</b>	<b>24</b>	<b>96,873</b>	<b>1.22</b>	<b>74 / 196</b>	<b>137</b>
<b>Finland</b>	<b>26</b>	<b>83,284</b>	<b>1.38</b>	<b>186 / 156</b>	<b>149</b>
<b>Ireland</b>	<b>33</b>	<b>67,248</b>	<b>1.26</b>	<b>56 / 99</b>	<b>104</b>
<b>New Zealand</b>	<b>35</b>	<b>63,835</b>	<b>1.51</b>	<b>96 / 42</b>	<b>148</b>

# LR within NZ

Institution	NZ ranking	No. papers	Citation impact	% papers cited
Univ. Otago	1	12,830	2.03	64%
NIWA	2	1,482	1.55	81%
<b>Landcare Research</b>	<b>3</b>	<b>1,497</b>	<b>1.53</b>	<b>77%</b>
Univ. Auckland	3	17,735	1.53	61%
Lincoln Univ.	5	1,344	1.38	72%
Victoria Univ.	6	6,108	1.35	58%
GNS	7	1,172	1.35	80%
Massey Univ.	8	6,668	1.31	63%
Univ. Canterbury	10	5,963	1.29	65%
AgResearch	10	1,653	1.29	74%
ESR	12	402	1.26	75%
Plant & Food Research	13	1,437	1.23	73%
Scion	17	487	0.93	71%

# Disciplines within LR

Discipline	No. papers	% NZ total	Citation impact (LR)	Citation impact (NZ)	LR ranking in institutes
Ecology	478	18%	1.51	1.41	12 / 307
Plant Sciences	218	15%	1.36	1.26	34 / 331
Environmental	168	9%	1.25	1.33	38 / 450
Zoology	144	13%	0.73	0.94	15 / 266
Entomology	111	22%	0.92	0.96	16 / 174
Biodiversity	93	16%	1.43	1.48	14 / 166
Soil Science	90	21%	1.20	1.52	19 / 165
Mycology	73	43%	3.05	1.78	4 / 185
Geosciences	73	4%	1.65	1.38	41 / 292
Evolutionary Biol.	59	8%	1.85	2.02	21 / 256
Forestry	58	14%	1.56	1.06	16 / 160
Geography	50	8%	1.61	1.41	22 / 181

# LR 'conventional' metrics

- Academic impact is a key metric
- LR in top 16% research organisations, globally
- Joint 3<sup>rd</sup> in NZ, ahead of other CRIs
- Range of disciplines where we are globally competitive
- Citation metrics skewed by few papers: 3% papers accounted for 39% of citations (23% not cited at all)
- 41 staff authored our top 50 papers: 15 no longer work for LR

# What is excellent science?

The Best People	A Rigorous Approach	Optimum Results
Individuals, teams , institutions well placed & skilled for research, sought after practitioners with reputations for high quality work, linked internationally and domestically	Well-defined, repeatable methodologies, careful implementation. Transparent and stringent peer-review. Best practice approaches. Risks identified and managed	Expansion and application of knowledge, wide dissemination, highly reliable and repeatable, strong application. International reputation enhanced

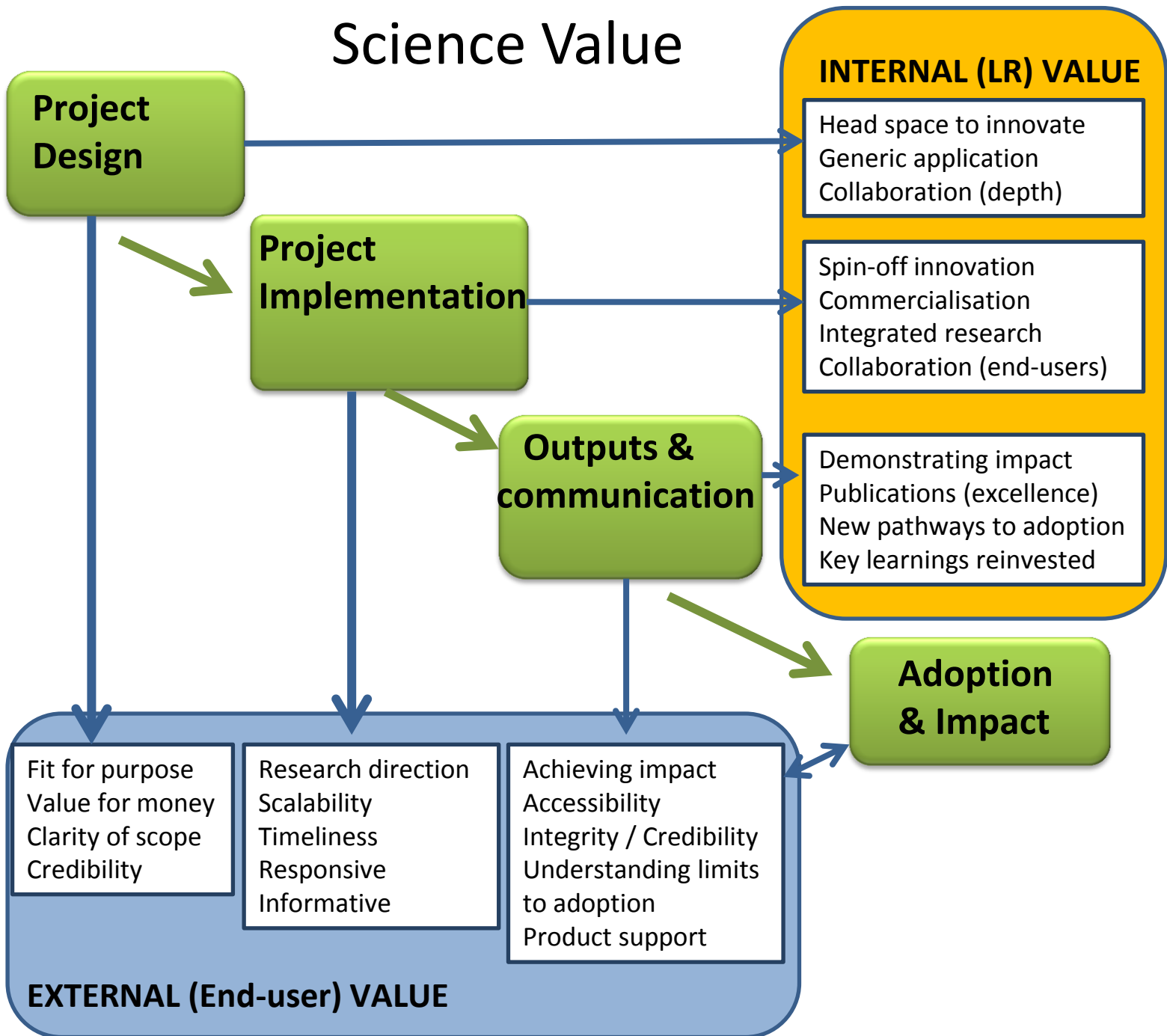


# What is excellent science?

- Academic excellence
- Impact and adoption (finding solutions)
- Outcomes and Outputs
- Fit for purpose, client focus
- Delivers value to us and our clients



# Science Value



# Value case studies

- Natural resources sector
- Primary Industries
- Science Challenges
- Maori

Synthesise results: Excellence

Impact

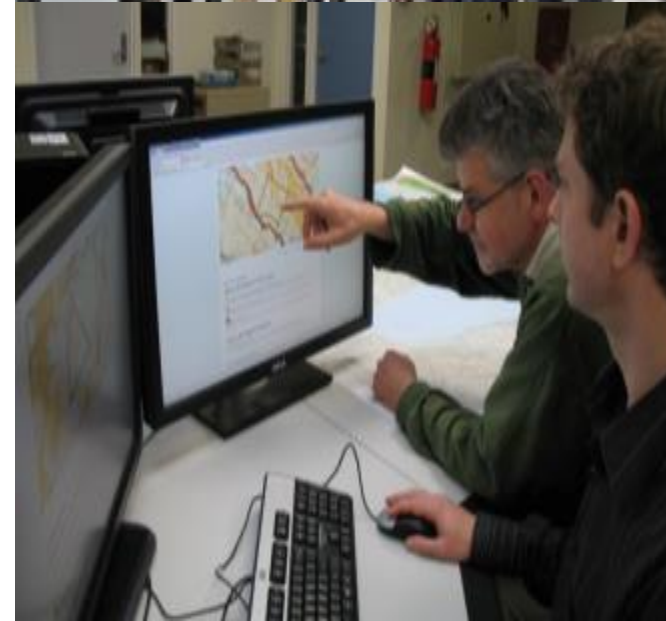
Collaboration



# Case studies



1. Land-cover database
2. Biodiversity indicators
3. Next generation DNA
4. Land visualisation web-tool
5. Māori collaboration
6. Invasive animals
7. Wetlands research
8. Smart irrigation
9. Mixed-species pasture



Key:

 Value achieved
  value partly achieved
  value not achieved
  value not relevant

Phase of work	Value	Score	Comment
Design	Fit-for-purpose		
	Value for money		
	Science credibility		
	Clarity for scope of work		
Collaboration & Implementation	Contribution to research direction		
	Scalability		
	Timeliness		
	Responsive		.
	Informative		
Adoption	Achieving impact		
	Accessibility		
	Integrity / credibility		
	Understanding limits to adoption		
	Product support		

# Excellence

Every sector values publications:

- Providing credibility to tools or approaches we develop and others adopt
- Informing end-users of technological advances and new opportunities
- Providing rigorous “proof-of-concept” of new approaches to old problems
- Increasing the reputation of our clients with their stakeholders (association)

# Publications globally

## Global pressure to publish:

- Citations key to funding and careers
- 585,000 per month and rising
- Harder to publish (journals reject 70-80%)

## Global response:

- Design research to maximise papers
- Don't take risks
- Lowers the impact (pulp fiction)



# Resilience: Hurricanes & Earthquakes

## Hurricanes

- Excellent science about predictions
- Predicted path of Katrina
- No relationship with stakeholders
- 1,800 people died, New Orleans smaller

## Earthquakes

- Excellent science about predictions
- Failed so reviewed
- Collaborated with end-users
- Stakeholders 'embedded'
- Maps target response



# Impact

- Take end-users / clients on a journey with us
- Identify the problem, then find 'the' solution
- Feed back emerging findings
- Design tools and how they will be used (co-design)
- Support and promote tools (business model)
- Concentrate efforts: build the right relationships
- Innovation takes time and is sometimes wrong

# The journey to adoption – Agri-business

“Co-design the tools and how they will be used”

“Produce whole solutions”

“Recognise innovation is a long and twisting path”

“Plan for R&D and subsequent support”



# Impact with Māori

## **Bridging Mātauranga Māori and Western Science**

- Our role with relatively few staff?
- Knowledge through partnerships
- Brokering role?
- Pick projects and back them

## Capacity building

- Whose?
- Clear about scope of project



# Collaboration

NZ Science landscape more collaborative:

- Opportunity to increase impact
- BUT, trend to lowest common denominator
- Cut our losses early

Challenges:

- Economy of scale with stakeholders
- Must not 'give away' key relationships



# Collaboration

## Primary Industries:

- Crowded space – be clear about our role
- Need to build trust – go on a journey
- Partnerships and leverage – how we use our funding

## Māori:

- Build the right relationships – key influencers
- Don't try too many



## Integration - Māori organisations

“Recognise the holistic world-view is not in silos”

“Take a long view”

“Meet on the marae, kanohi ki te kanohi”

“Build capability for working across boundaries”

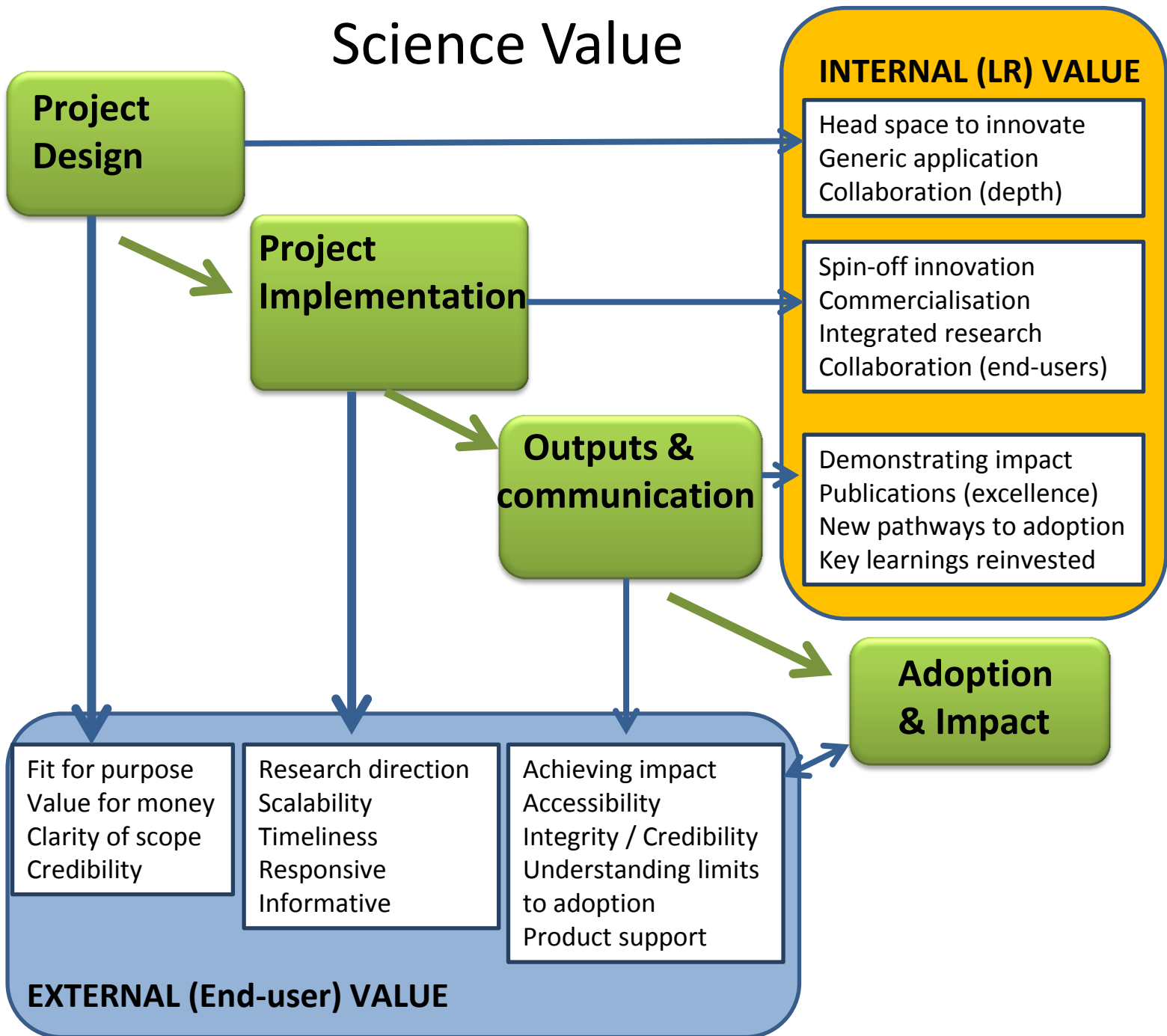


# Next steps

- Use score cards at project scoping phase (plan for success)
- Identify potential publications and authors at outset
- Evaluate our success externally
- Build values into:
  - LR 'promise' when bidding
  - Comms. and marketing
  - How we allocate core



# Science Value





# Indicators

## Lag

- Citations
- Journal Impact factors
- Collaborative authorship
- Commercial reports
- Confidence of end-users
- No staff in stakeholder workshops
- Licensing deals for IP

## Leading

- Identified relevant internal & external values
- Space for writing papers
- Need for integrated research considered
- Good collaboration
- Building a relationship
- Will seek feed-back (score-cards)