

OUR LAND
AND WATER

Toitū te Whenua,
Toiora te Wai

What's changed and why?



OLW Challenge objective

“To enhance primary sector production and productivity while maintaining and improving our land and water quality for future generations”

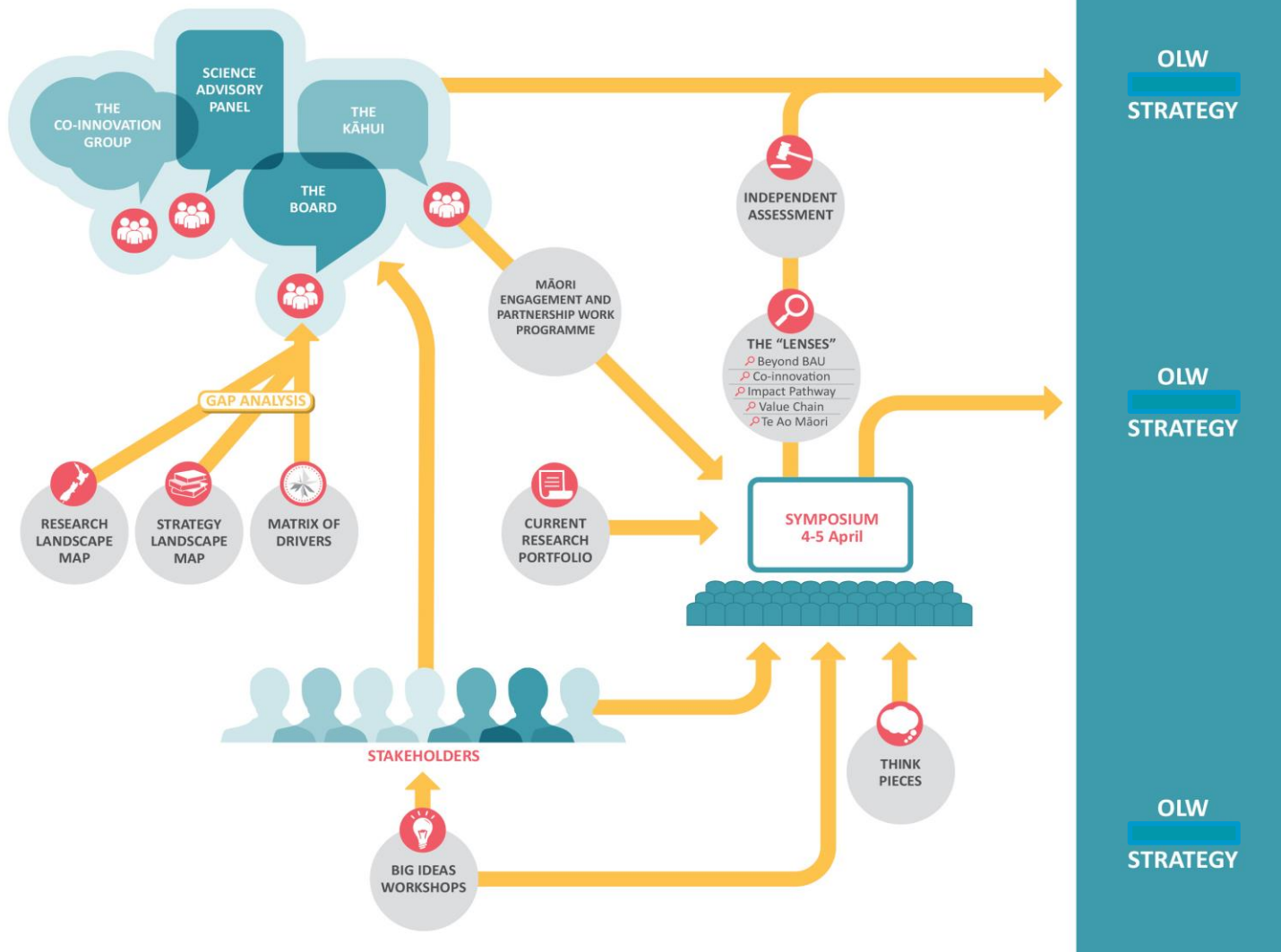


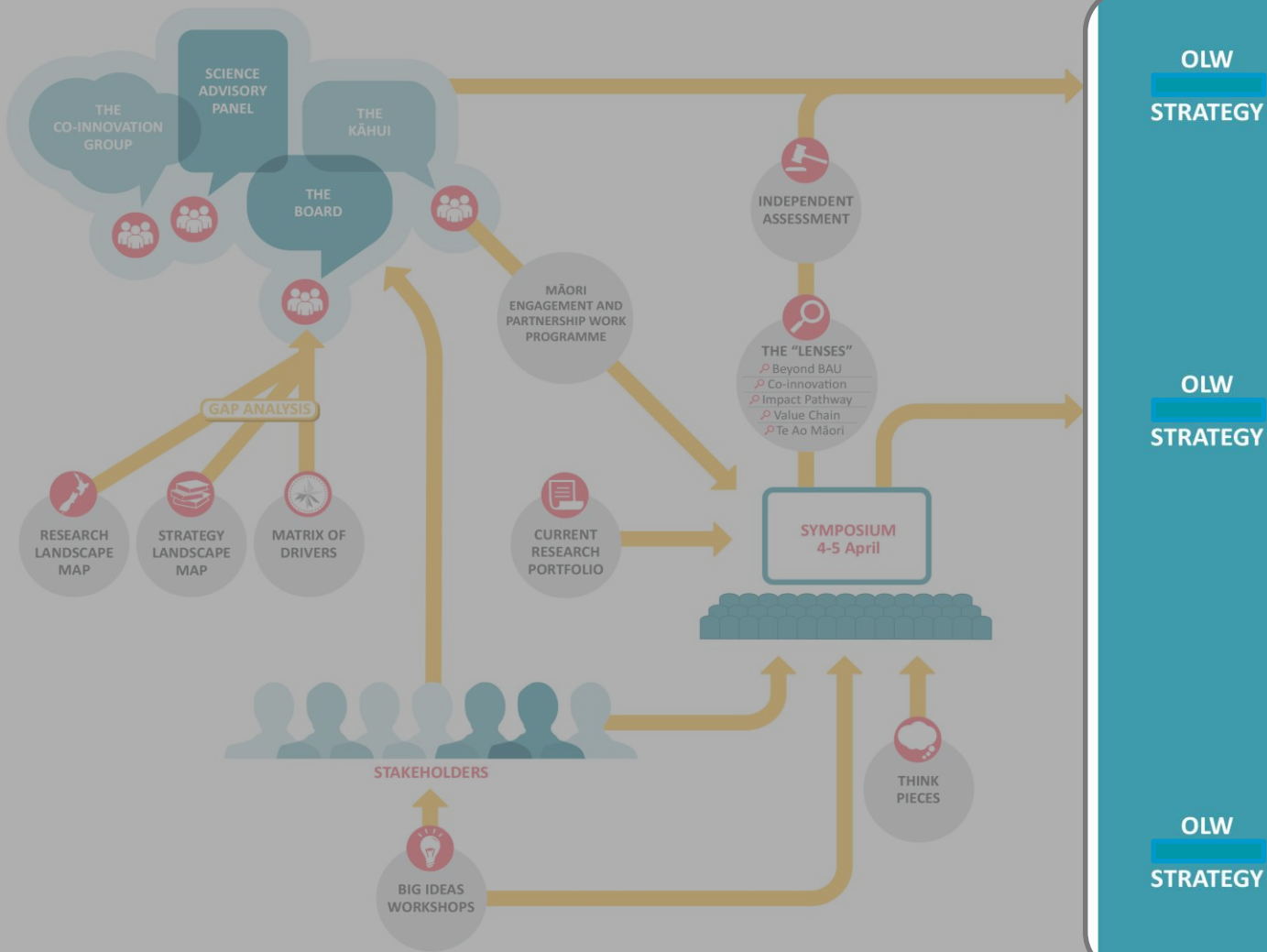
OLW Challenge objective – (as we choose to see it)

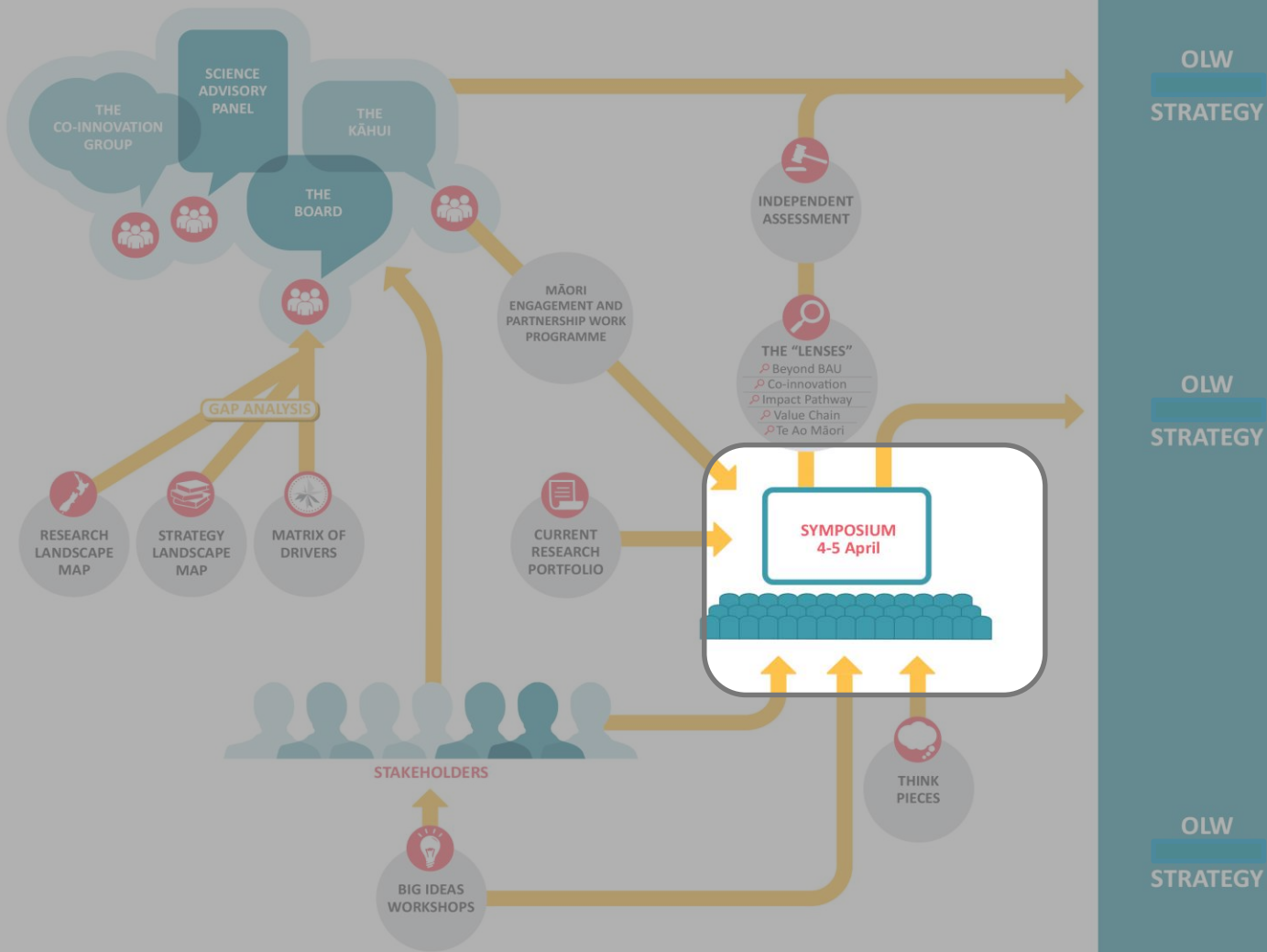
“To maintain and improve our land and water quality for future generations, while enhancing the value of the primary sector to New Zealand”

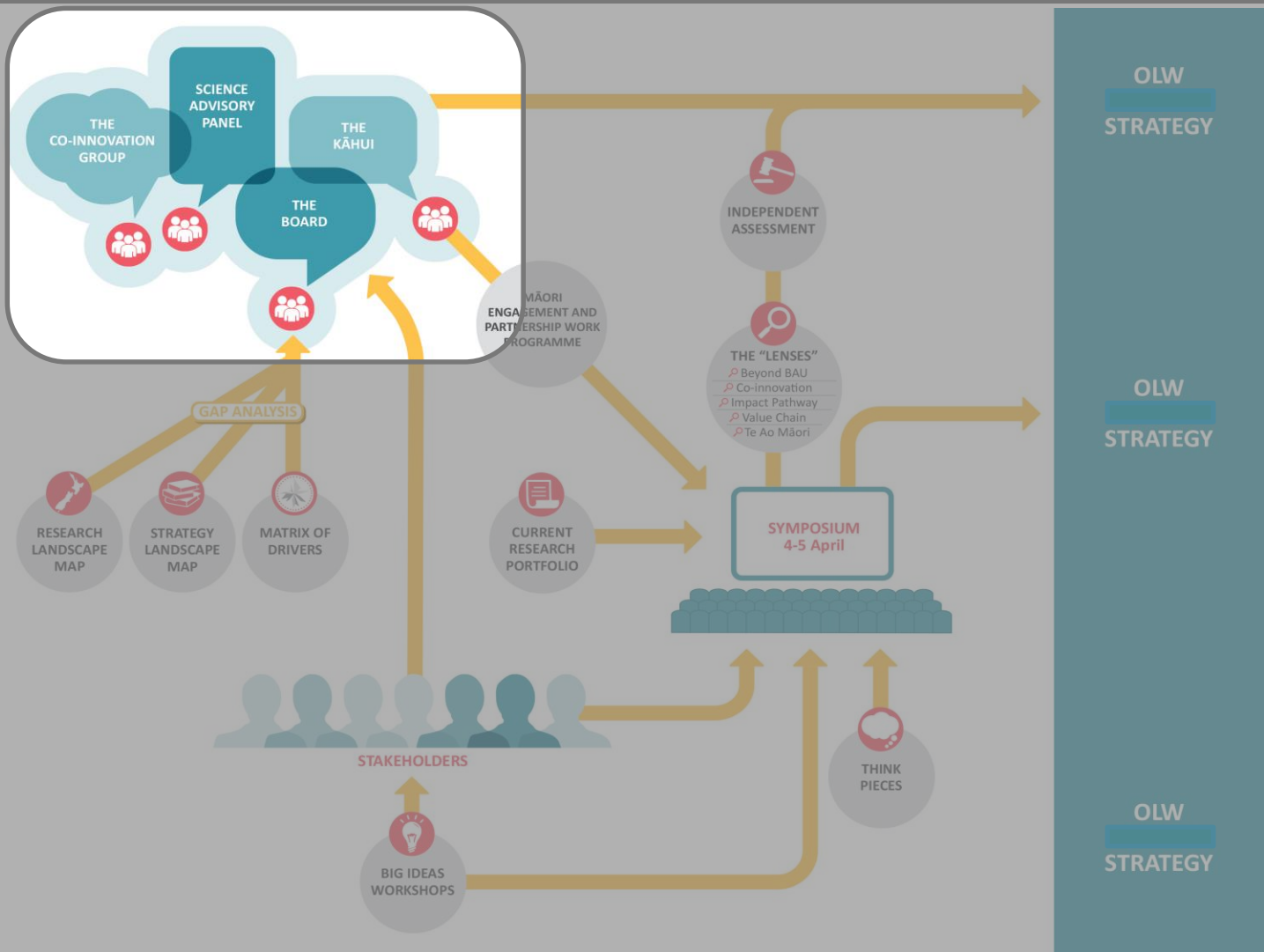


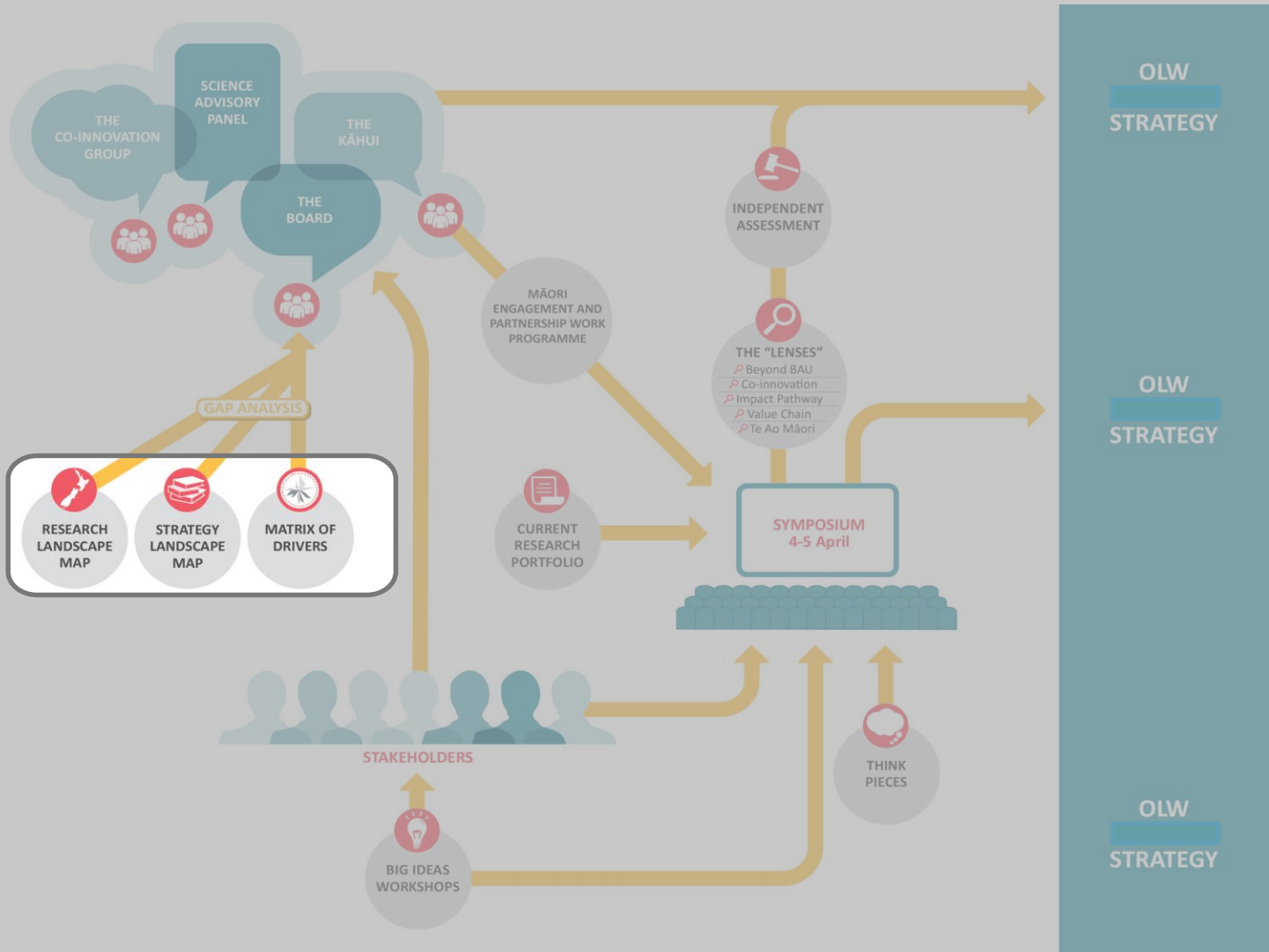
Where does everything fit?

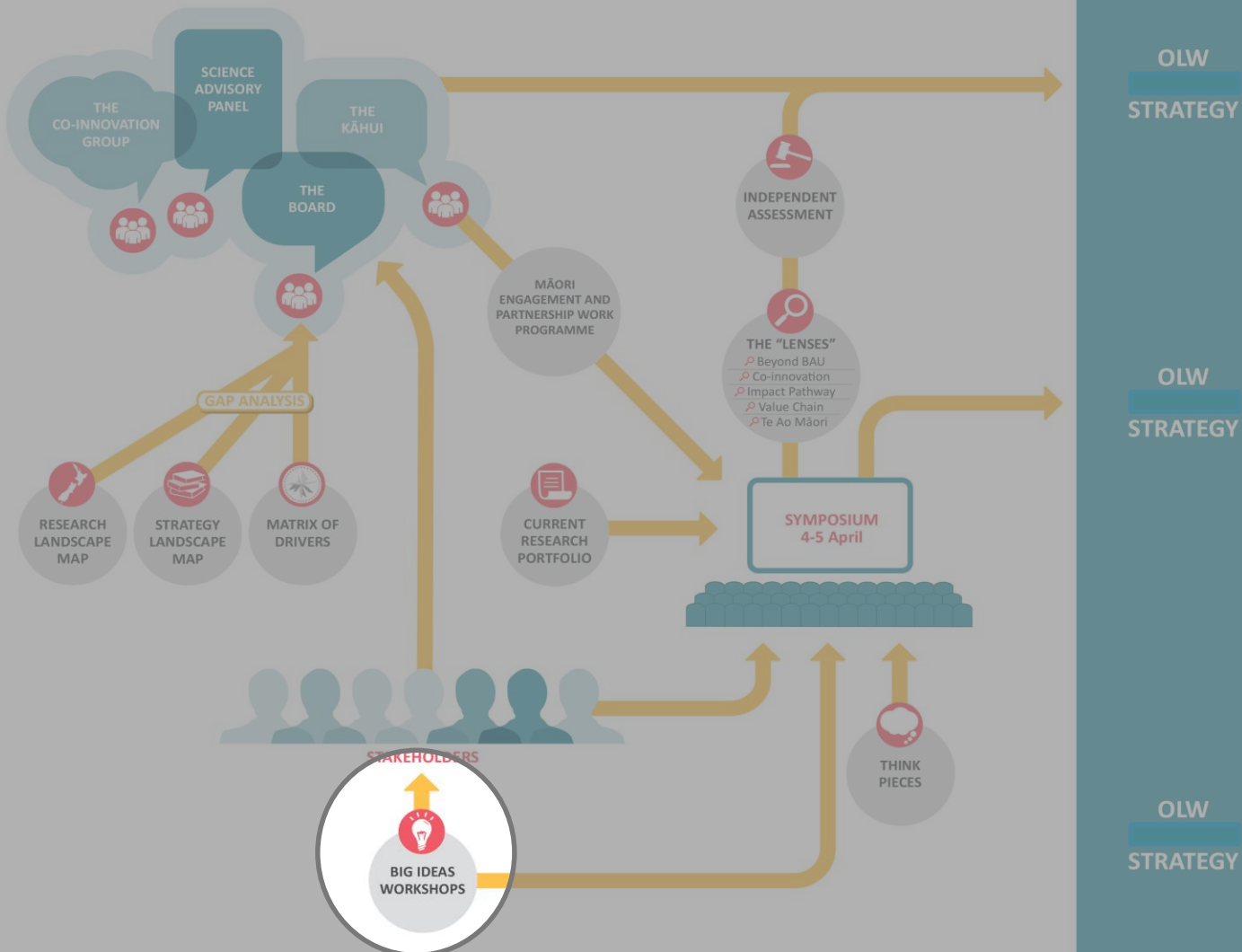


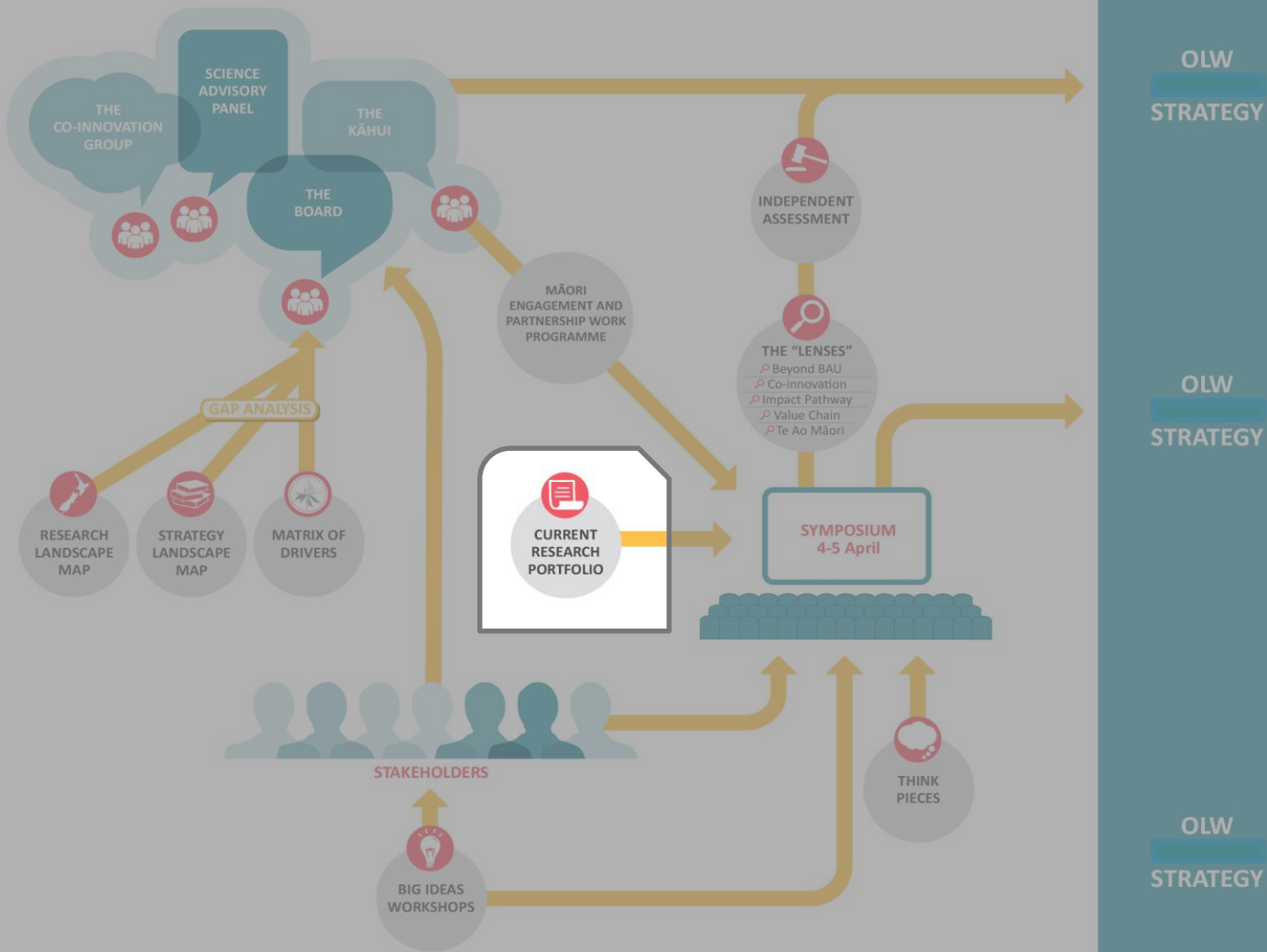








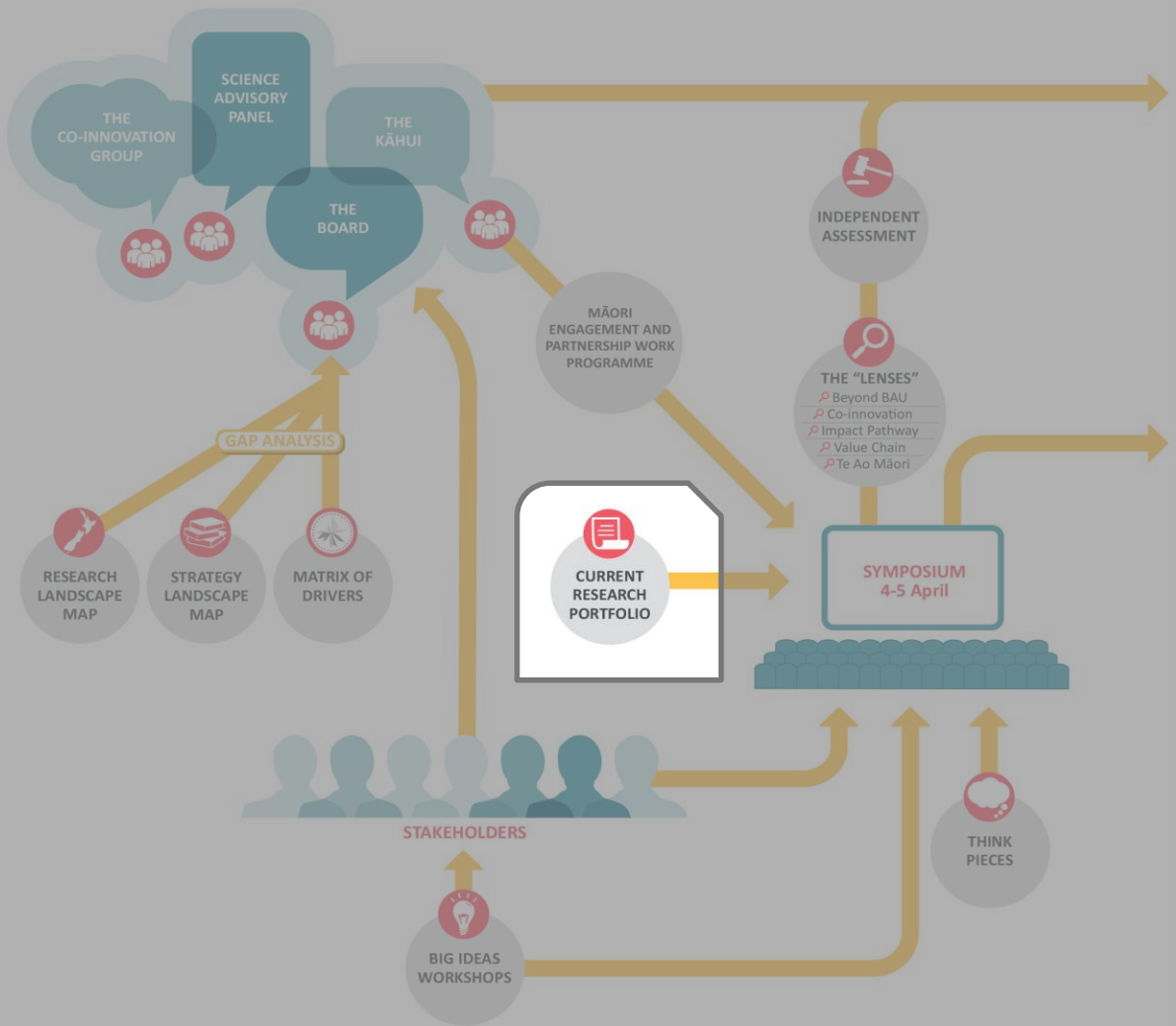


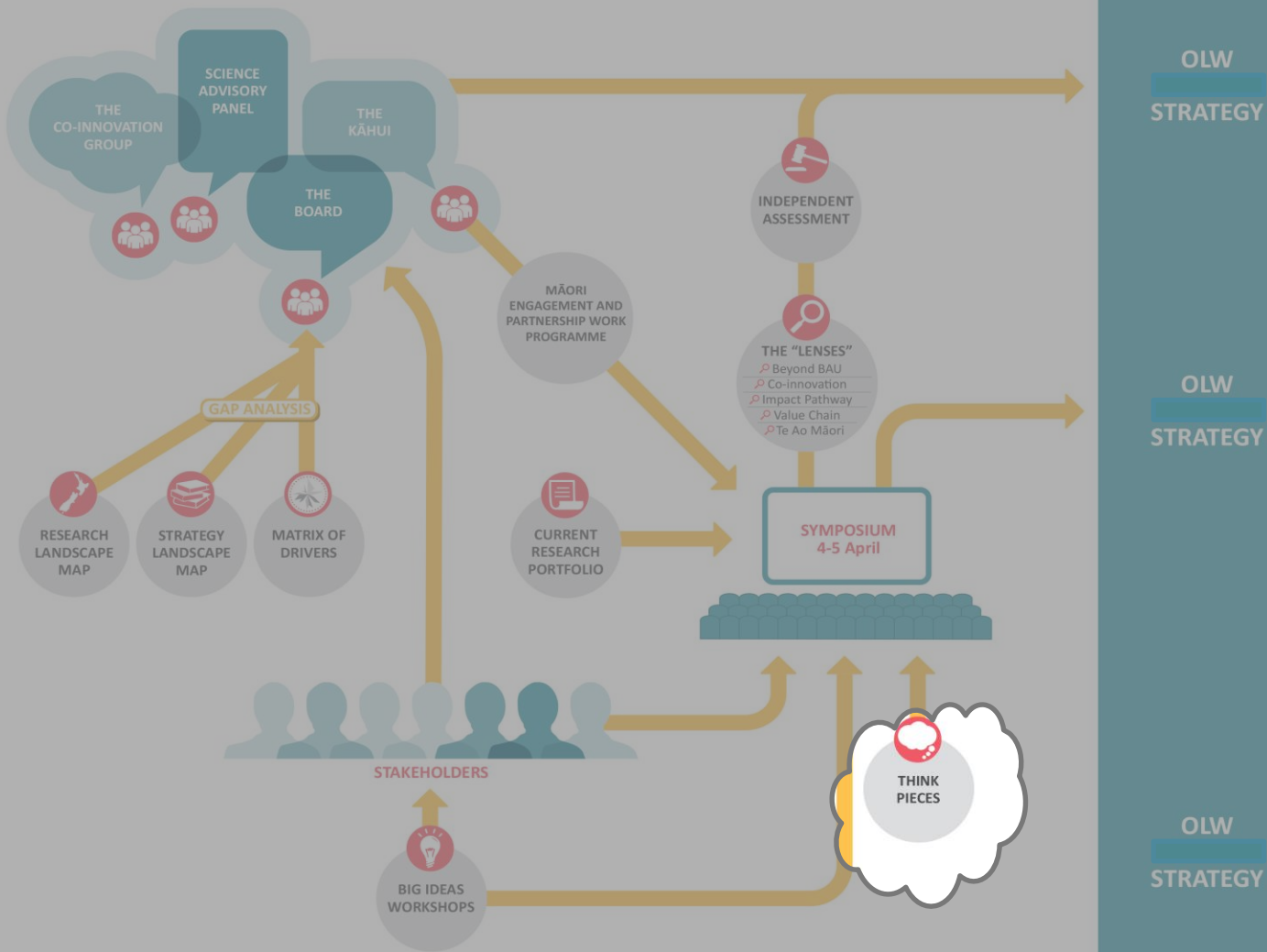


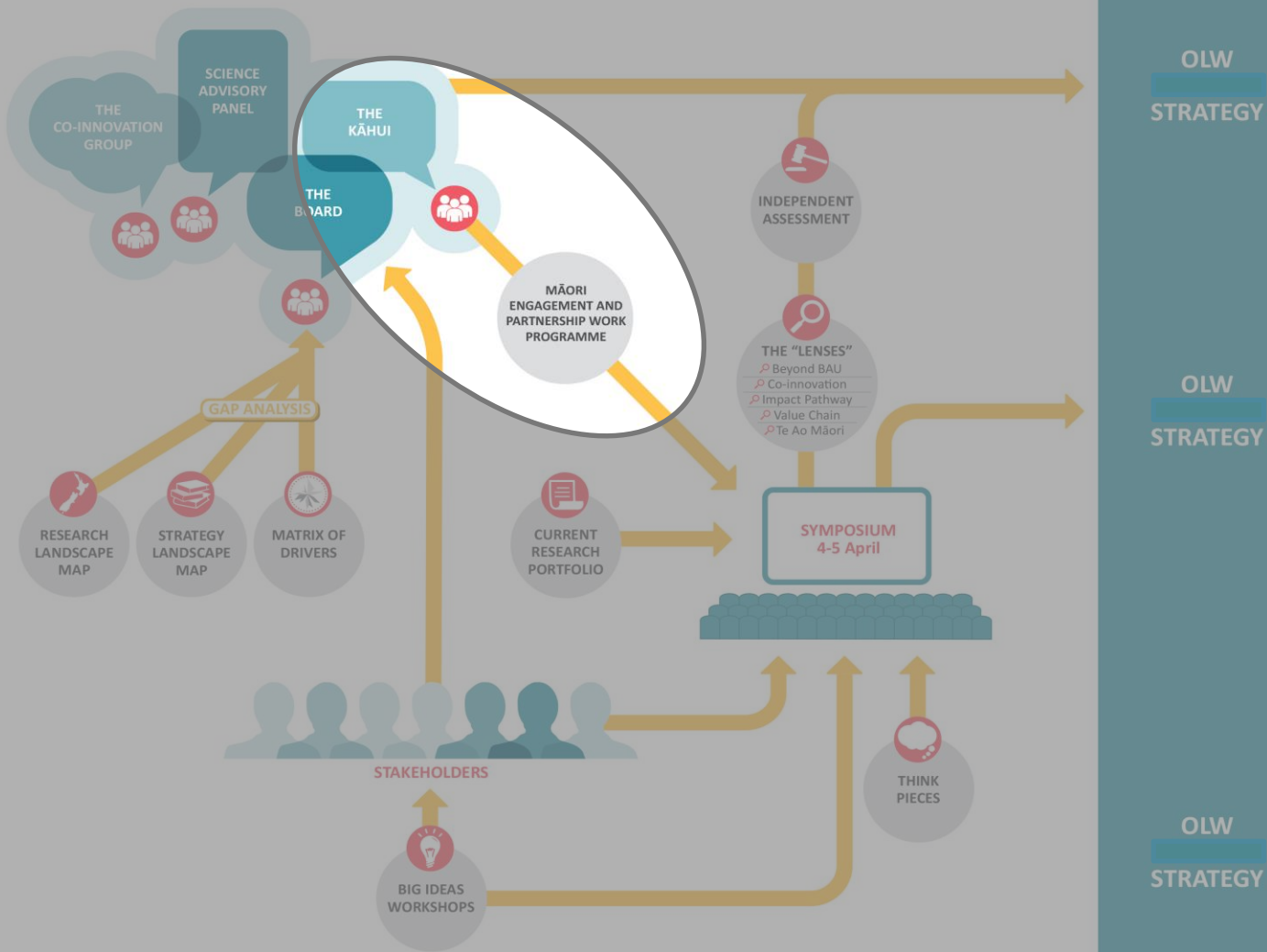
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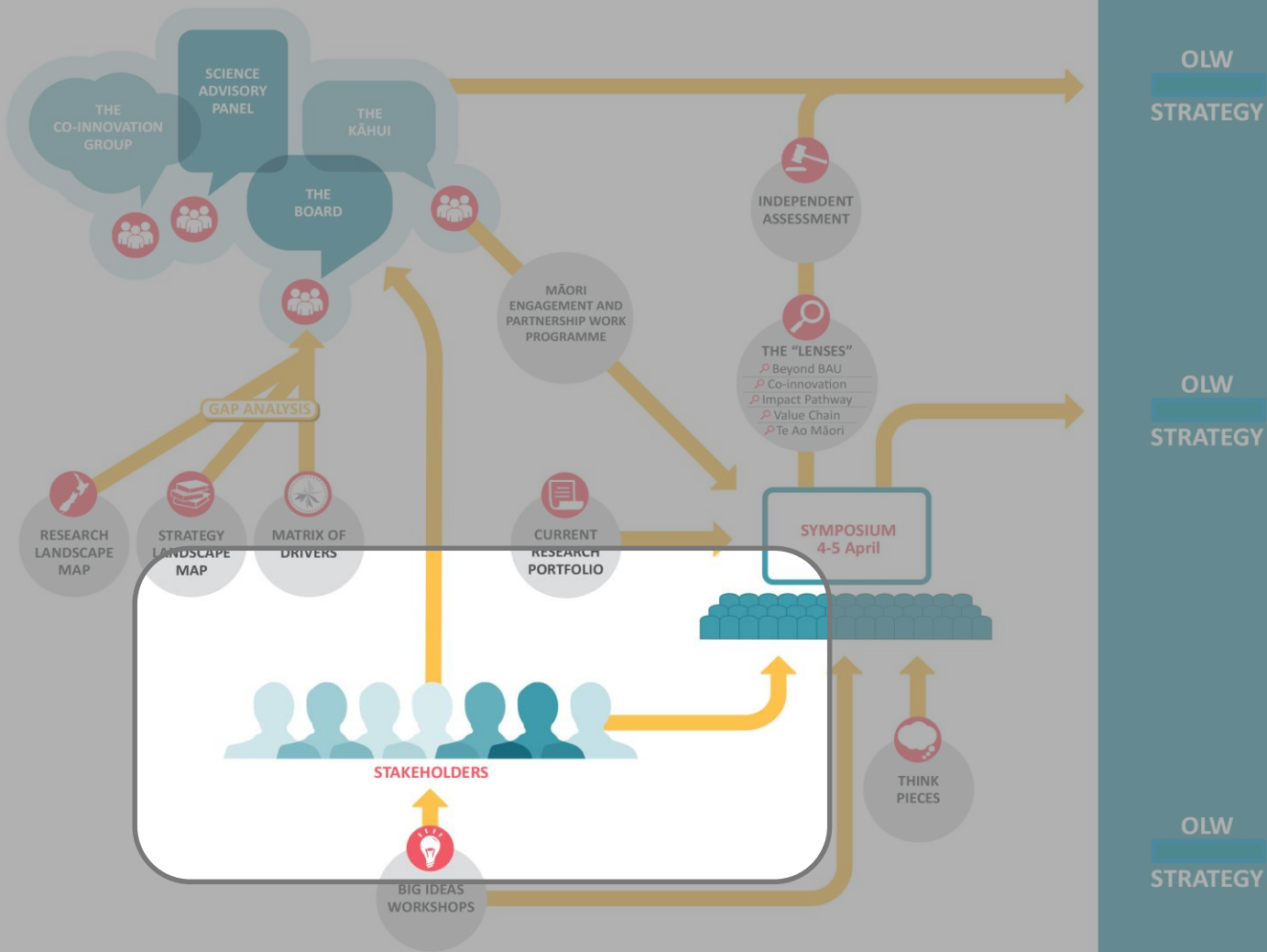




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Where does everything fit?

Information stream	Role
Matrix of drivers	Identify drivers to leverage for impact
Kahui workplan	Co-ordinated impact with and for Māori
Research landscape map	What's being done and impact to challenge objective
Strategy landscape map	What will be likely implemented
Science Advisory Panel	Science quality and excellence
Co-innovation group	What needs to be done now
Wider scientist and stakeholder	What is the research and how can it be developed
Think-pieces	Refining nascent research questions

What does this information provide?

The evidence for what is needed (accelerate research), the best way of working and how to frame the research towards the challenge mission

Definition of the problem

Niche, research question, perspectives (“lenses”)

Co-innovation – who and how

Processes to incorporate new knowledge, accounting for unintended consequences

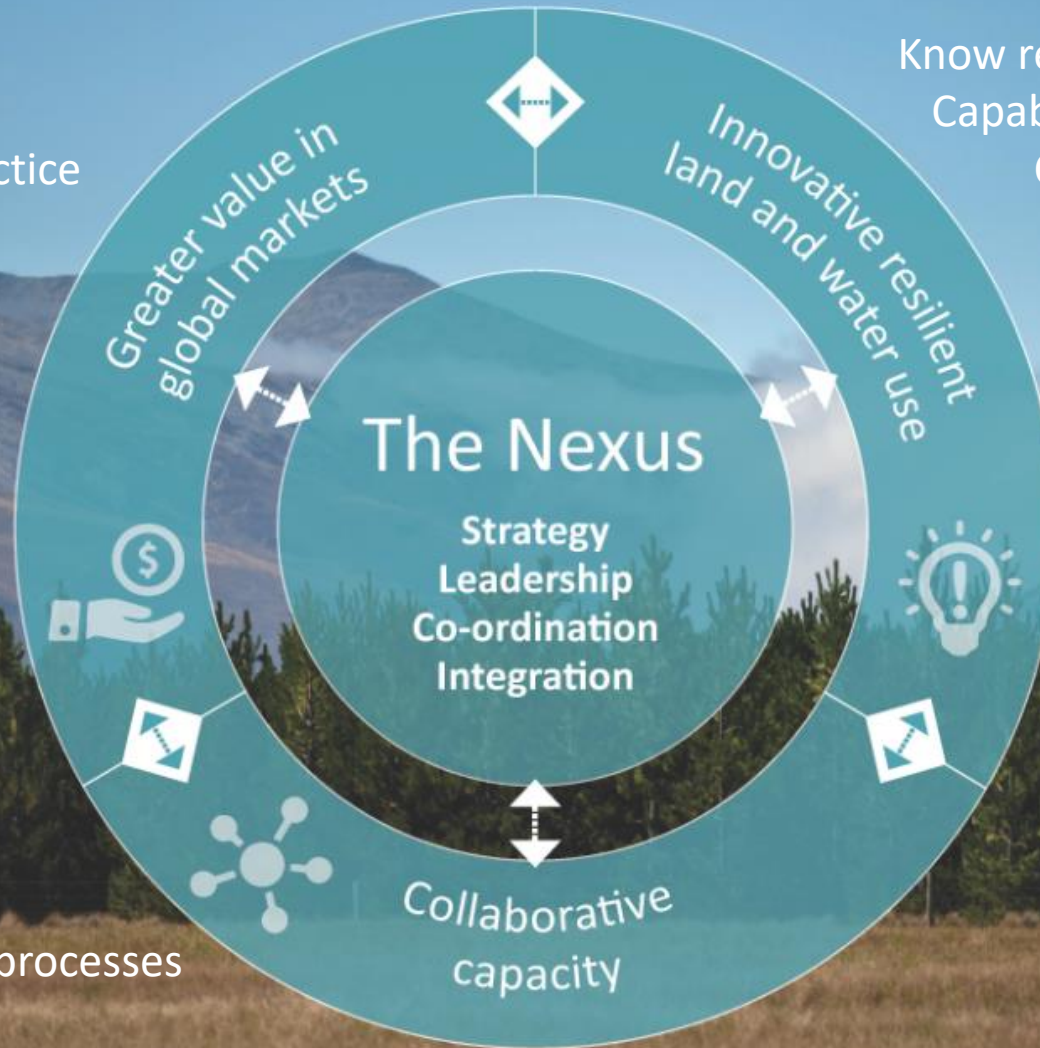
Impact on the challenge mission

How/what practices will change (leverage drivers)? How will we know? How transformative will they be?

Current structure and research logic

Capture value
Distribute value
Drive better practice

Know resources/practice
Capability to Suitability
Create Headroom
New systems and technologies



Improved tools/processes
Social capital
Better, faster, robust decisions/limits

What are the drivers?

Climate change, ETS & water quality

Diverse, radically different, land use

A scarcity of good water

Reclaiming a social licence to operate

Accurate ag (our impact from mountain to sea)

The role of tech in selling our products

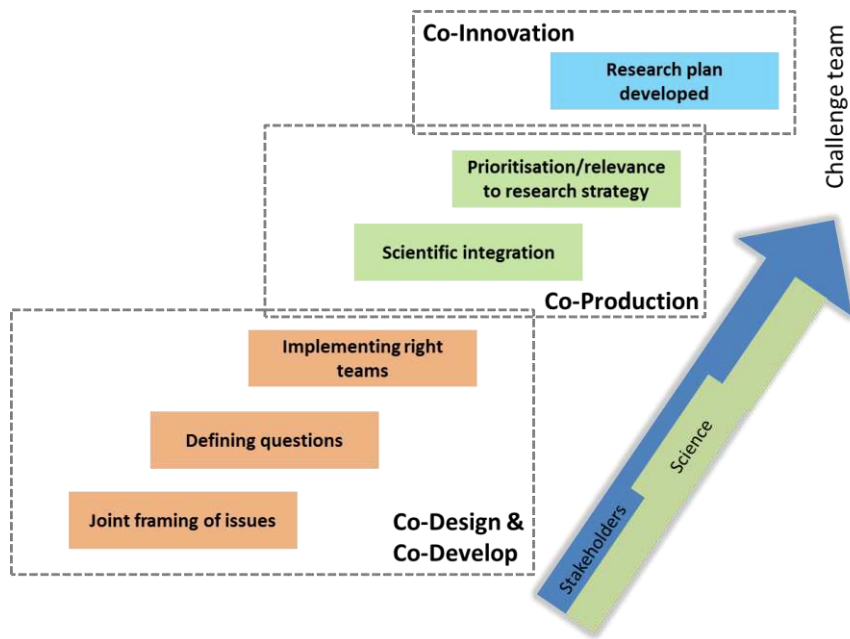
Smarter and wealthier consumers

Proof of sustainability

Using a New Zealand identity to stand out



Co-innovation and why?



Current time to peak adoption = **19.5** years (Aus/NZ).

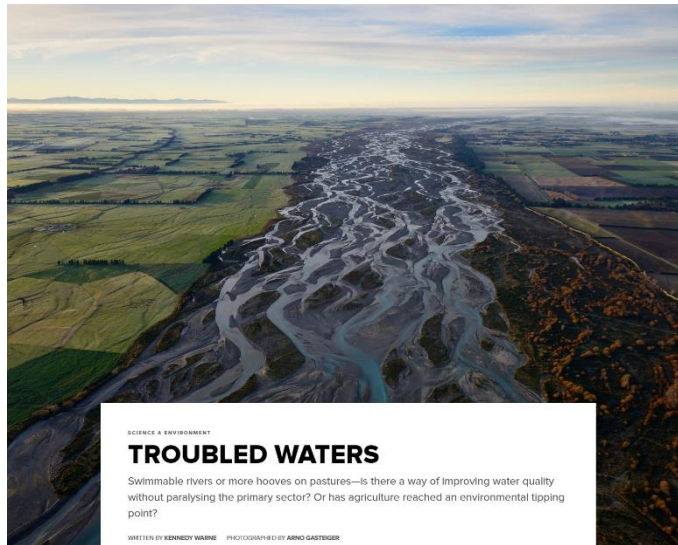
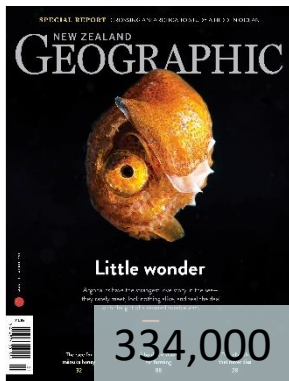
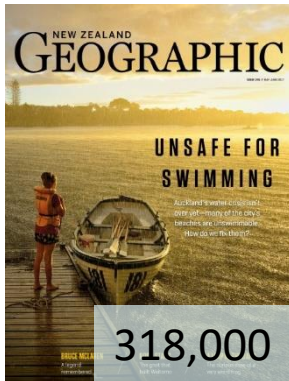
Hyp: That co-innovation can halve this.

Research landscape map has shown significant increases in:

- Role of collaboration (doubled)
- Building capacity
- Knowledge into action

More high-impact SSIF-funded work is aligned to mission, but less Endeavour-funded work.

Are we pitching the story right?



Here's a bloody good article from NZ Geographic.

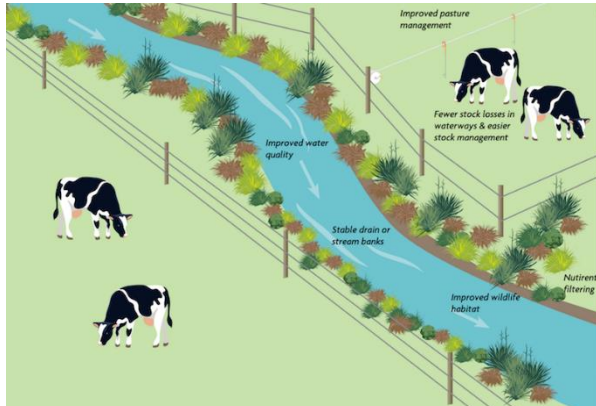


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Is our story having impact?



Is our story having impact?

Published online September 21, 2017

Journal of Environmental Quality

TECHNICAL REPORTS

LANDSCAPE AND WATERSHED PROCESSES

Assessing the Yield and Load of Contaminants with Stream Order: Would Policy Requiring Livestock to Be Fenced Out of High-Order Streams Decrease Catchment Contaminant Loads?

R. W. McDowell,* N. Cox, and T. H. Snelder

Abstract

More contaminants are lost (per ha) as stream size increases in catchments dominated by pastoral agriculture.

77% of contaminant load comes from exempt streams.

Fencing is effective at decreasing contaminant losses, but we have many other strategies that are likely more cost-effective in headwaters.

Core Ideas

Fencing off high-order streams from stock reduces 77% of national load of reactive phosphorus (P) and nitrate-nitrogen (N) from catchments dominated by agriculture.

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It is well established that the water quality of streams and rivers is affected by diffuse agricultural pollution (Carpenter et al. 2009). However, the relative influence of land use on stream quality can be allocated as loads (e.g., kg nitrogen [N]) or yields (e.g., kg N ha⁻¹ yr⁻¹) in individual farms. To help meet these limits, farm-level investigation strategies that target areas of the farm with the greatest yield (Doody et al. 2012; McDowell et al. 2016). However, contaminant loads are not necessarily increasing with increasing catchment and stream size, increasing or decreasing from source to the site of impact downstream depending on flow-paths and associated processes (Bricker et al. 2014). A systematic methodology that describes contaminant losses from headwaters to the catchment outlet is lacking but is important to help policymakers and land managers understand the relative influence of inputs or impacts within a catchment (Biggs et al. 2017; Meals, 1996).

Stream orders (Horton-Strahler classification) have been used to characterize stream size and catchment area (Hughes et al. 2011) and to explain variation in contaminant concentrations, loads, and yields (Wigington et al. 1998). When focusing on contaminant concentrations, an almost equal number of studies have found no effect of stream order as those that have. The absence of stream order effects may be caused by the examination of regions where all other significant factors such as land cover are kept equal (Turner et al. 2015). In contrast, studies that focus on loads or yields examine one or two stream characteristics, such as stream size, but fail to take into account (potentially) overriding effects of land cover or other factors (Larned et al. 2016). Studies that combine stream order with interactions of other factors such as land cover are rare. In one such study, Buck et al. (2016) found that N and phosphorus (P) concentrations were well buffered in fourth-order streams by the percentage of grazed pasture land cover in the upstream catchment area but



Election 2 days later



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Supplemental material is available online for this article.

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Abbreviations: DRP, dissolved reactive phosphorus; FDC, flow duration factor; NH₄-N, ammoniacal N; NO₃-N, nitrate + nitrite; N:REC, River Environment Classification; REML, restricted maximum likelihood; SS, suspended sediment; TN, total N; TP, total P.

Is our story having impact?



Nil in utile quod non honestum

THE PRESS

Exempt streams carry biggest pollution load

4 Oct, 2017 5:22pm

© 5 minutes to read



More than three quarters of pollution flowing into our freshwater catchments comes through small streams that regulations don't require to be fenced off, a just-published study has shown. Photo / File



By: **Jamie Morton**
Science Reporter, NZ Herald
jamie.morton@nzherald.co.nz
@Jamienzherald



Greeny15000

174 days ago

This result has been known for many years, although some extra precision presumably has academic interest. Fencing is an important contributor but efforts by industry and regulators have been concentrated



AHenderson

174 days ago

The point isn't really that more fencing and planting needs to be done, it's that fencing and planting aren't really the great solution some make them out to be. An overhaul of the system is needed,



Oldprofarmer

175 days ago

It doesn't make sense to you Steve because you are assuming that it is about Dairy Farming. What it is saying, is that pollution is occurring before the rivers come near our dairy farms. So I think this article will be attacked by those who believe that us dairy farmers are the main cause. Keep up the good work



BIM37

175 days ago

It's important to actually READ THE PAPER to understand WHAT IT MEANS. It is not about fencing off the dribbles of water that come out of gullies and make there way into streams and rivers.



realiststeve

175 days ago

ok... didn't see it from that angle.. that interesting cheers mate



solardb

175 days ago

It is good to see an informed post such as this , makes the comments worth reading.

Is our story having impact?

Taranaki's regional council water standards higher than national targets



CAMERON BURNELL/FAIRFAX NZ

A plan to fence off all waterways on the Taranaki ringplain regardless of their size or location would improve water quality more than any current national recommendations, a report says.

A plan to fence off all waterways on the Taranaki ringplain regardless of their size or location would improve water quality more than any current national recommendations, a report says.

However the water quality levels would still not be enough to reach the government's "swimmability" target.

The council commissioned Lincoln University Professor Richard McDowell to present a report comparing potential improvement in water quality in the region from riparian fencing based on the council's preferences, with recommendations by the Land and Water Forum (LAWF).

The regional council favours fencing off and planting all waterways to reduce pollution and nutrient levels while the LAWF recommends fencing to exclude all stock from those waterways wider than a metre and 30 centimetres deep, through flat land, wetlands and where strip grazing is used.

READ MORE:

* [Swimmability targets under fire for ignoring smaller rivers where families swim](#)

* [The thorny politics of 'swimmable', a word losing its meaning](#)

* [Analysis: 'Swimmability' only part of the grim freshwater story](#)

The McDowell report, presented to the regional council policy and planning meeting on Tuesday, showed there were more benefits to water quality if the regional council plan was followed than the LAWF recommendations, council environment quality director Gary Bedford said.

"The regional council's approach would bring about bigger reductions in the level of contaminants in the regions waterways," Bedford told the meeting.

"The council's requirements go beyond the recommendations by both the LAWF, and the government," he said.

"For example there would be substantial reductions in the levels of phosphorus which is what matters most in Taranaki."

There would also be significant reductions in levels of suspended solids, E.coli and sediments, he said.

Learnings...

Co-design helps identify the real question

The public's understanding of the subject is improving

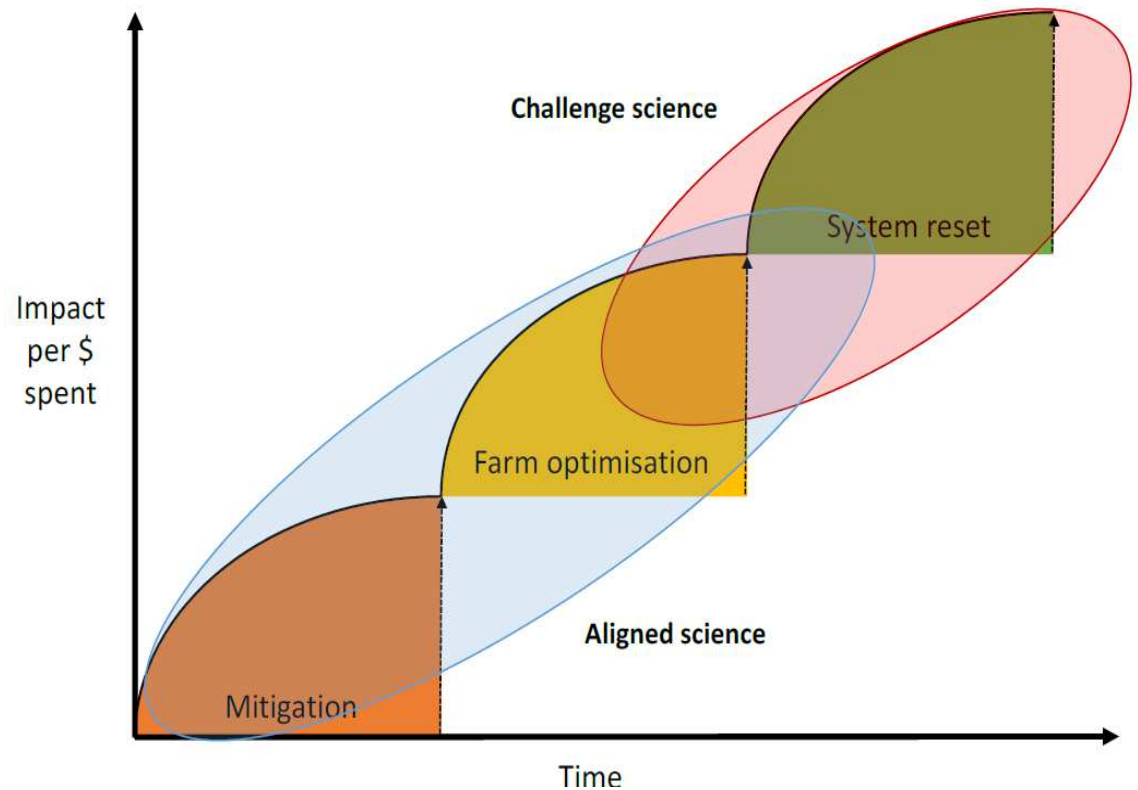
Open-access is facilitating this understanding

Just be happy someone is noticing....

But what impact do we want?

Co-innovation involves different **approaches** to the way knowledge is generated and shared and **refreshed**.

Transformation results in measurable and **substantial improvements** in multiple parts of the system.



But what impact do we want?

Problem: 80,000 landslides caused by one storm in 2004 resulted \$300M lost from the regional economy.

Approach: Sustainable Landuse Initiative involved multiple stakeholders who worked together to show that landuse change in 10% of farm land could reduce sediment by 50%.

Refreshed: Whole farm plans establish and document business goals (refreshed 5-yearly).

Substantial improvements: 380,000 ha covered in farm plans (mid-2014), \$40M invested by government, \$20M by land owners. Significant improvements in water quality (sediment, *E. coli*), and

“all sectors of our communities look now look at land use differently, not just farmers”

Where to from here?

On-going opportunities for more dialogue with stakeholders.

Otherwise, two-pagers from presentations due by 5 pm on the 26th of April.

Assessed on the 1st of May (stakeholders + scientists) with recommendations to be made soon after.



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