NZ's Conservation and Environment Science Roadmap

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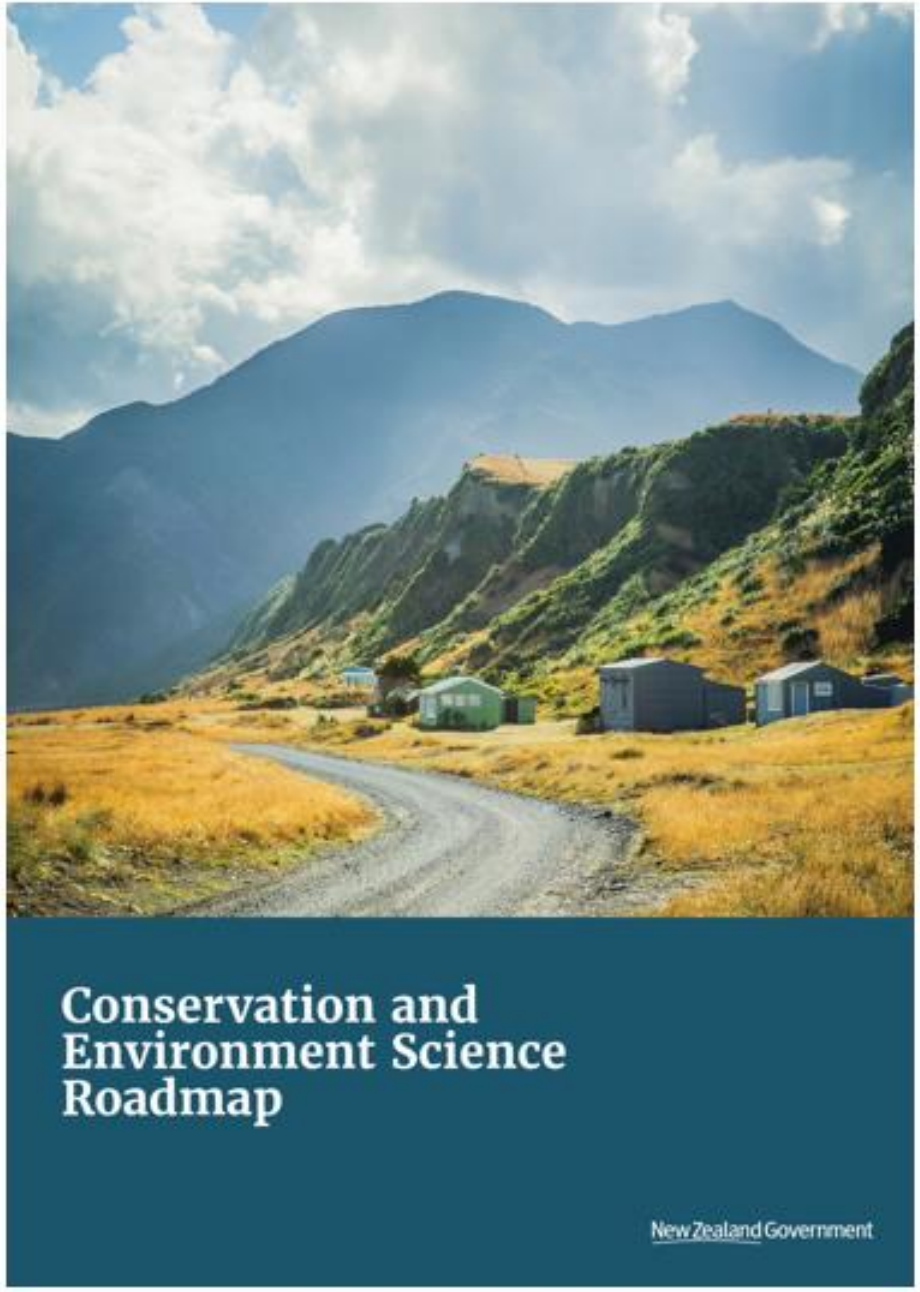
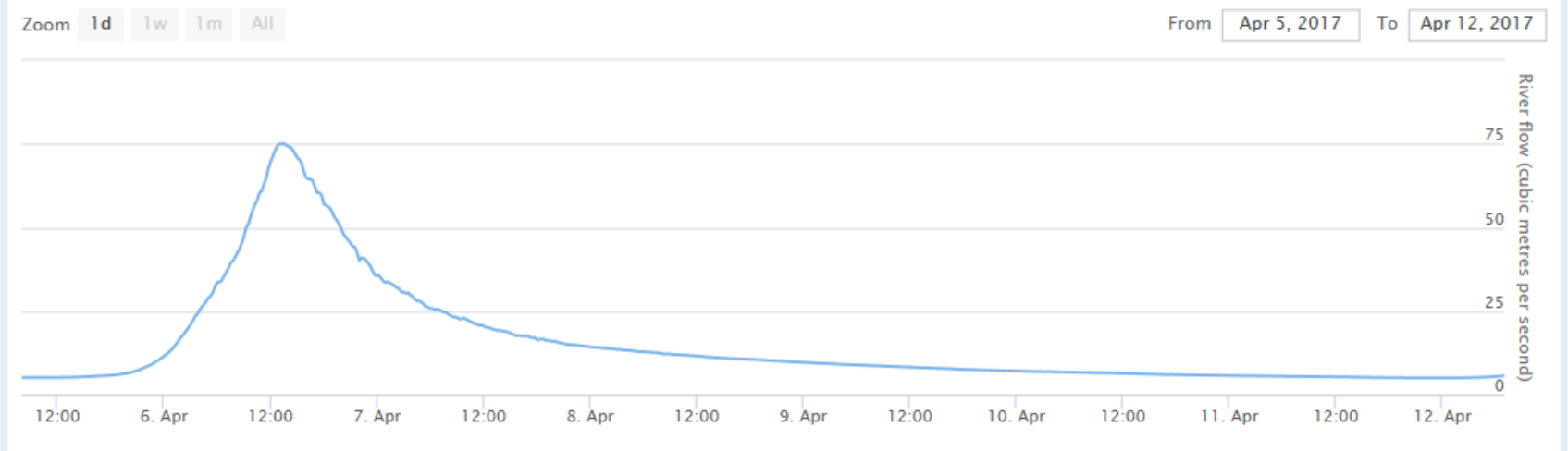
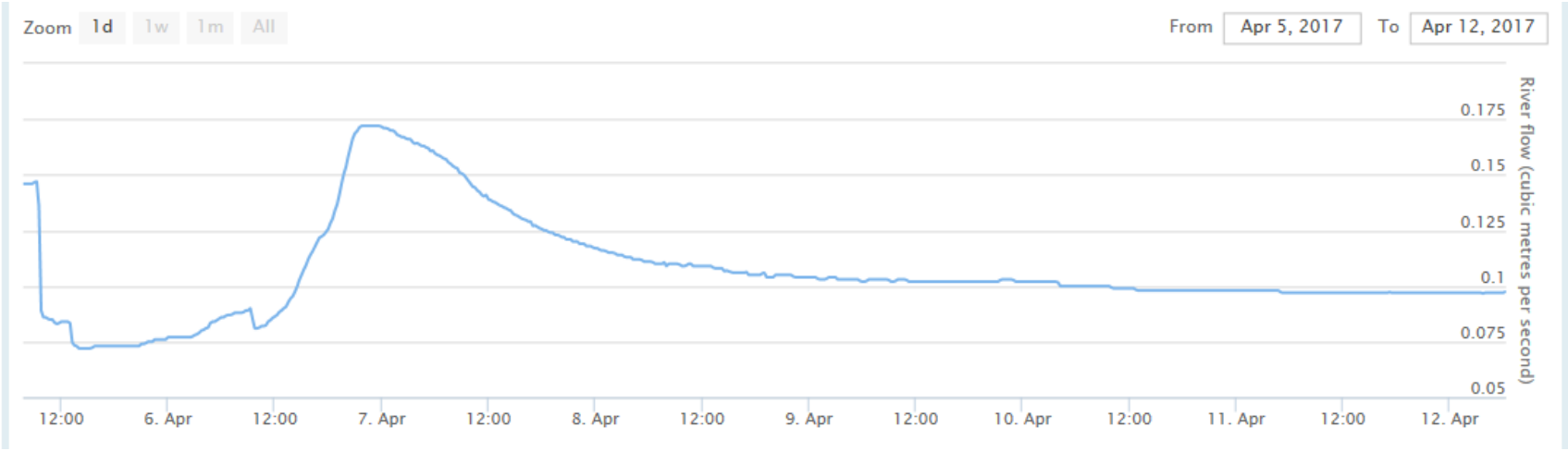


Can a scientist please explain the following & help me develop policy to fix it, whatever it is?



Selwyn at Whitecliffs – last week peaked at 75m^3s^{-1}: more than an annual flood event & half a 10 year flood event; more than the Waimakariri is flowing at today!



Yet the Selwyn at Coes Ford – peaked at 'nothing'!

Background to the Roadmap

- More demand than ever for evidence-based decision making
- Seemingly ever changing science system
- Multiple funding mechanisms & providers
- Despite NSSI removal of ‘ring-fencing’ left a gap in ‘direction’
- Recognition good science takes time
- Questions about growing / maintaining expertise & infrastructure
- Govt increasingly joined up in NRS thinking yet not in setting science direction

The task, the challenges, the product …

- Purpose:
  - map out a shared vision of NZ's future science priorities & capability needs, the work from which will inform future policy making
- Jointly prepared by:
  - DOC & Ministry for the Environment, sponsored by Ministers & Sir Peter Gluckman
- Timeline:
  - Feb 2016, completed Feb 2017 – amazing!
- Independent Strategic Advisory Group chaired by Sir Peter
- Officials Working Group:
  - CSAs of DOC & MfE & other key govt departments including MPI
- Resulted in around 60 priorities & 16 for the next 5 years

Groupings & Themes – taxonomies drove us to distraction

- **Process themes -** support all areas of research & are interwoven into all other themes, but also stand as themes in their own right.
  - ***Theme 1: Environmental monitoring and data management***
  - ***Theme 2: Mātauranga Māori***
- **Pressure themes:** cross-cutting issues across the biophysical domains.
  - ***Theme 3: Climate change***
  - ***Theme 4: Biosecurity***
- **Domain theme:** relates to interactions between ecosystems & processes across all domains
  - ***Theme 5: Integrated ecosystems & processes:*** Data, understanding & tools to inform integrated management of the environment as a whole, involving complex interactions between sub-themes
    - ***Land:*** Data, understanding & tools to guide policy & management approaches to improve conservation & environmental outcomes, including mitigating the potential impacts &/or threats from disturbance, climate change, land use, & natural hazards.
    - ***Fresh water:*** Data, understanding & tools to support policy & management approaches that achieve healthy & resilient ecosystems & habitats, meet cultural & recreational needs & avoid adverse human health impacts, while enabling efficient, equitable & productive use of water.
    - ***Coasts & oceans***
    - ***Urban***
    - ***Species & populations***
- **Human dimensions theme:** relates to the 'human' factors affecting the environment, including links between values, beliefs & environmental attitudes, environmental knowledge, social licence issues, & engagement in governance & decision-making.
  - ***Theme 6: Social & economic factors***

Indicative research priorities for the next five years – what a job this was on Xmas eve!

- ***Environmental monitoring*** **-** New & improved tools for gathering & reporting data on condition & trends for our land, freshwater, air & marine environments.
- ***Climate change*** **-** Adaptation & mitigation scenarios that test & demonstrate the sensitivity of New Zealand's environment, economy, & society to climate-related impacts & extreme events; Technologies & practices for reducing greenhouse gas emissions; Models that help us better understand how changes to land-based activities that affect greenhouse gas emissions also influence freshwater quality & quantity & biodiversity.
- ***Biosecurity*** **-** Widely accepted & affordable solutions to invasive pests, weeds & diseases that have high-risk conservation, economic or health implications.
- ***Integrated ecosystems*** **-** Models that assess the effectiveness of interventions, particularly freshwater restoration programmes, including whitebait fisheries; Improved understanding of how our use of land affects freshwater quality & ecosystems; Predicting environmental thresholds & tipping points so we can look after our natural ecosystems better; Models & data that help communities make resource management decisions that have implications across our land, freshwater & marine ecosystems.
- ***Freshwater*** **-** A better understanding of how contaminants, including excess sediment, affect ecosystems, human health, & recreation to inform how we manage urban & rural land & water use.
- ***Coasts & oceans*** **-** Identifying key marine habitats that provide for the values we hold for biodiversity, traditional food gathering (kaimoana), recreation, & commercial fisheries; Understanding present & future threats to these habitats, including from climate change, & assessing management options.
- ***Species & populations*** **-** Cost-effective technologies to manage the threats to native species, particularly to help achieve the 'predator-free New Zealand 2050' goal; Improved tools for completing taxonomic inventories of coastal & oceanic species & land-based invertebrates.
- ***Social & economic factors*** **-** How to build social & cultural capital to manage the environment more effectively (including the acceptance of new technologies); Comprehensive models of New Zealanders' values, beliefs & understanding of conservation & the environment.

Anticipated Roadmap Outcomes – I will later look ahead 10 years and tell you what I think we will have achieved

Clarified priorities for environmental & conservation science for:

- Optimising internal agency funding
- Aligning cross-agency funding
- Informing external funding & research
- Identifying ongoing needs for research capacity, capability & infrastructure
- Assist MBIE, other science funders, national science challenges, CRIs, in their priority setting & decision making
- Integrating overlapping research needs

The biggest challenge by far

- IMPLEMENTATION
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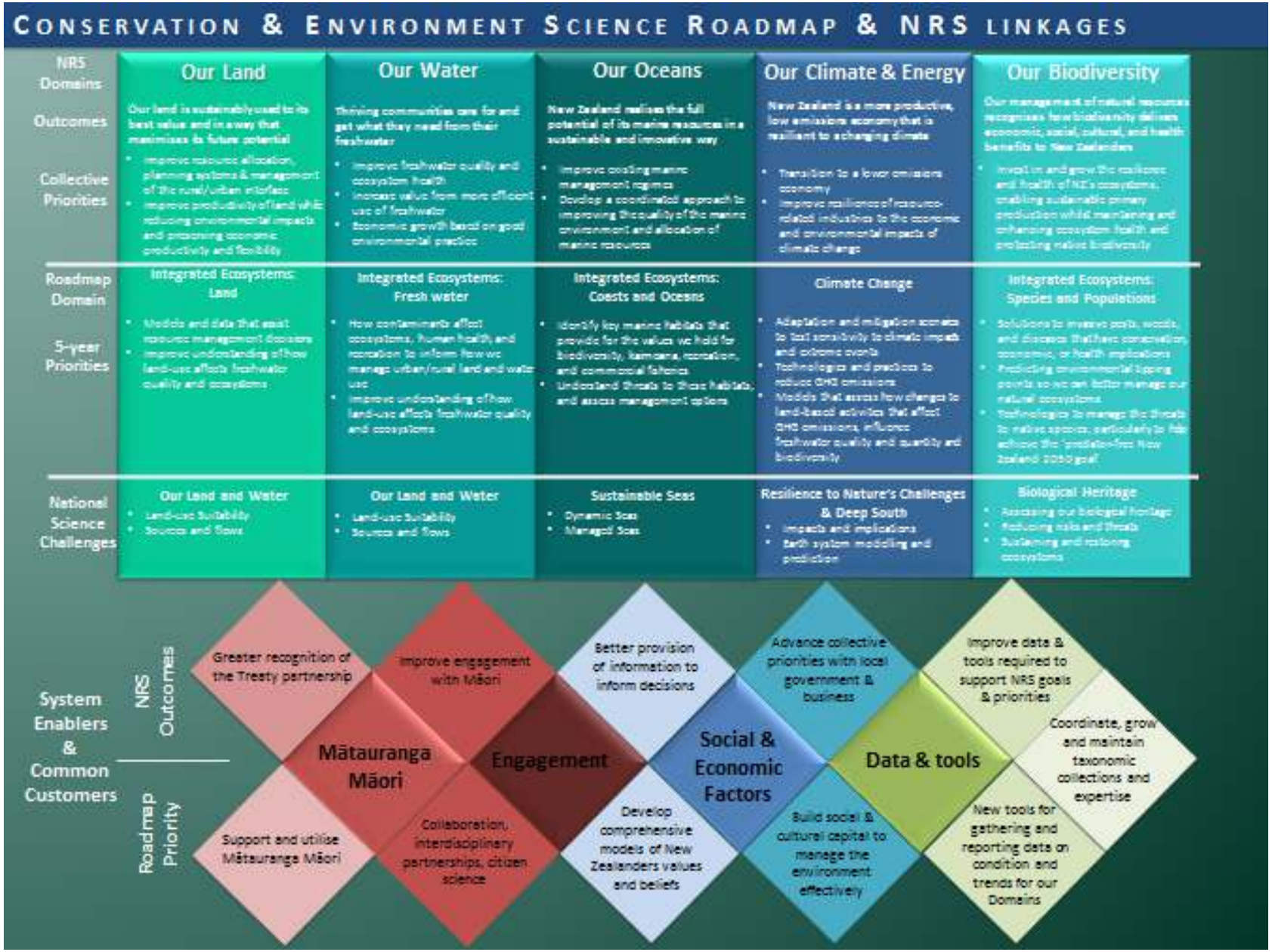
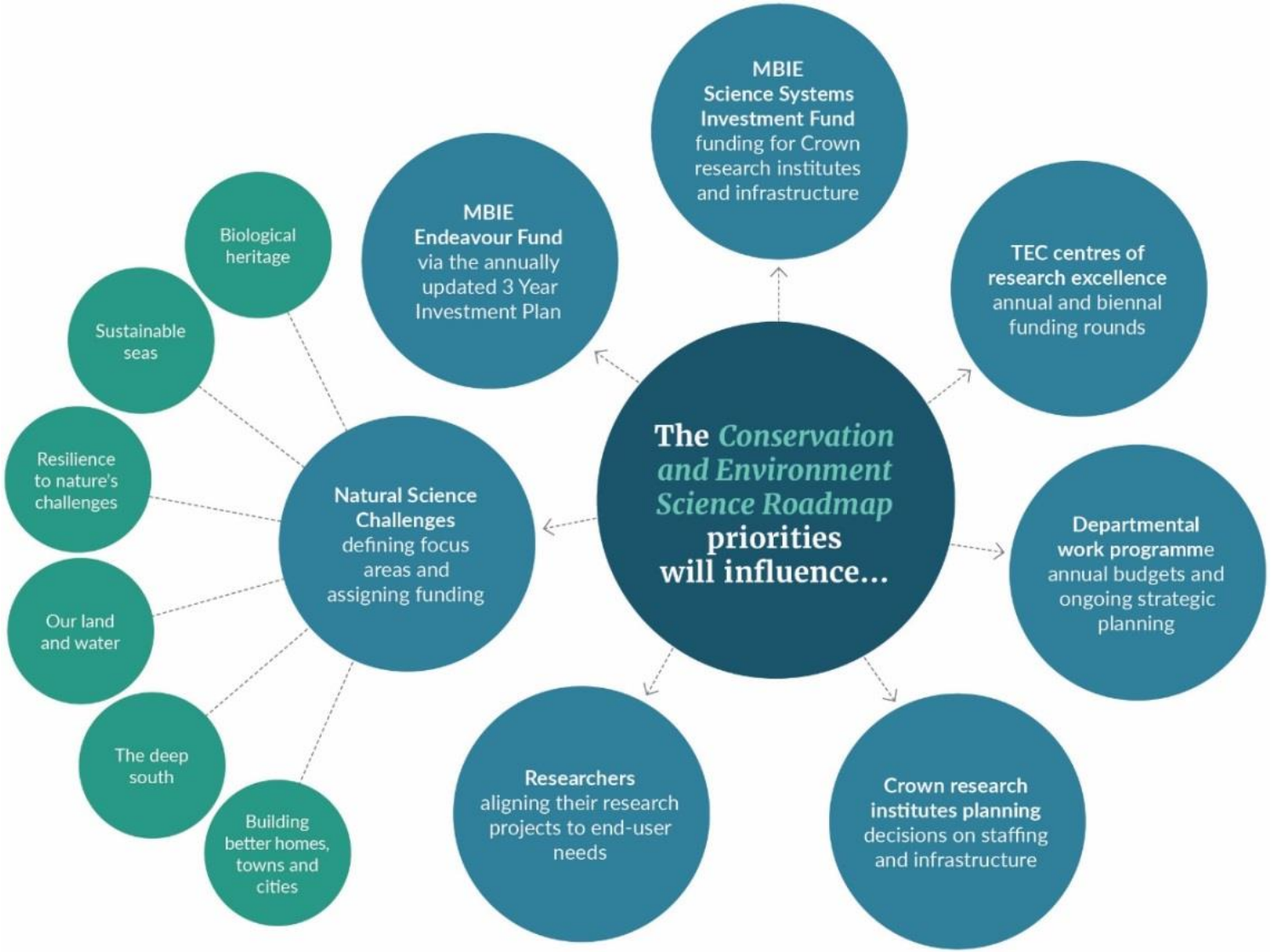
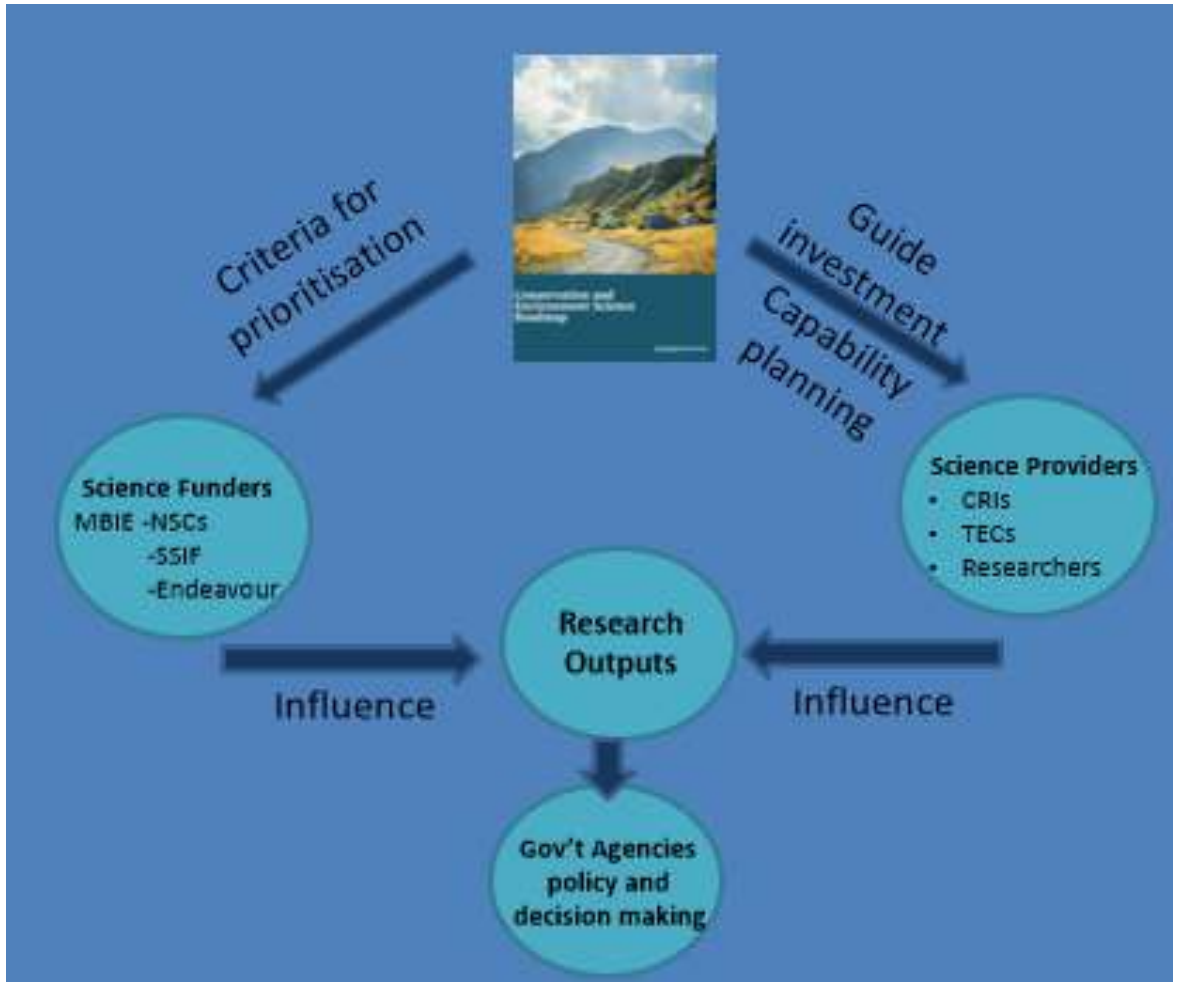
Understanding the playing field – a game of more than 2 halves!



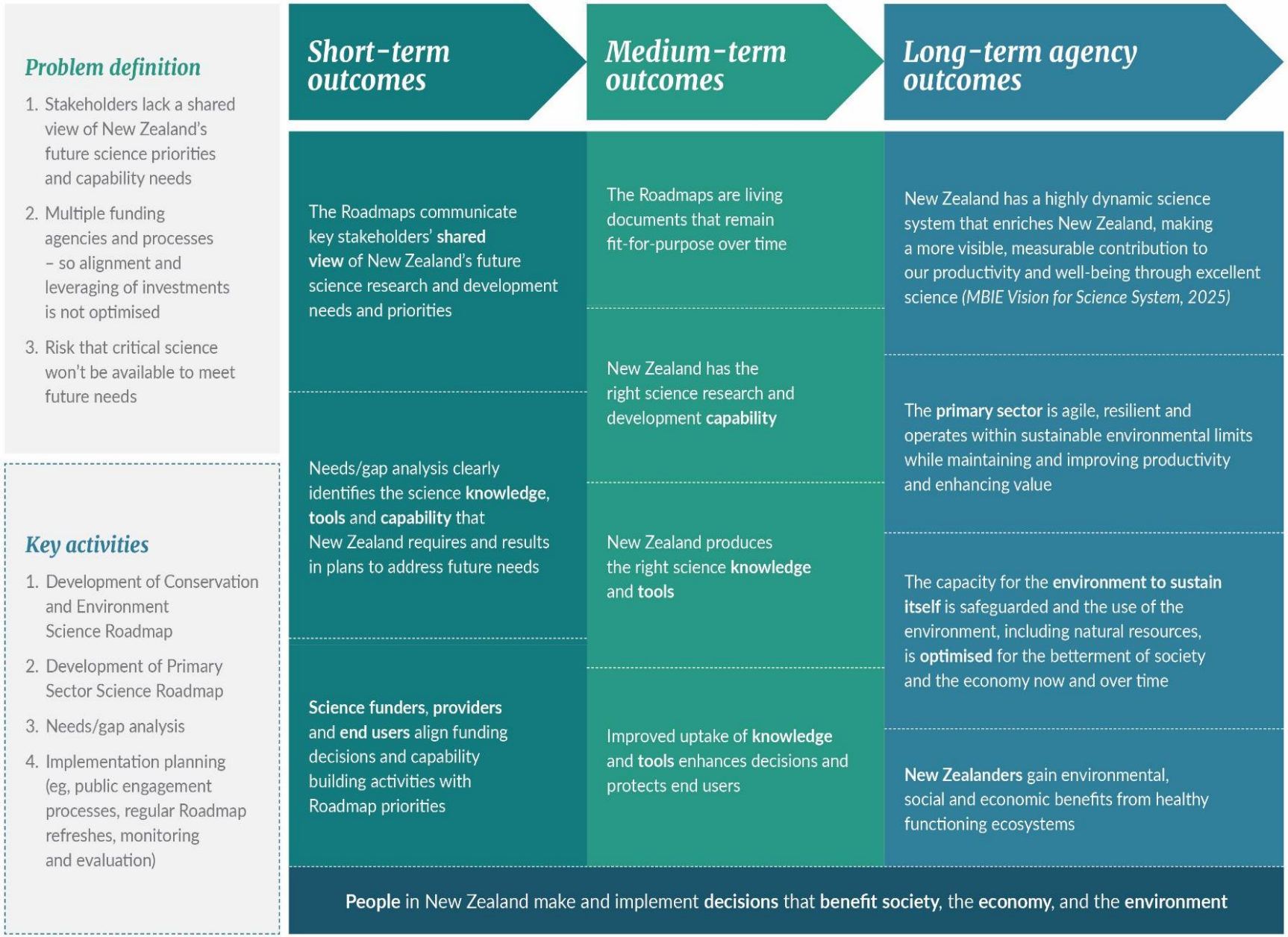
Which is trying to influence …



By providing and further influencing …



Leading to …


Problem definition
1. Stakeholders lack a shared view of New Zealand's future science priorities and capability needs
2. Multiple funding agencies and processes – so alignment and leveraging of investments is not optimised
3. Risk that critical science won't be available to meet future needs
Key activities
1. Development of Conservation and Environment Science Roadmap
2. Development of Primary Sector Science Roadmap
3. Needs/gap analysis
4. Implementation planning (eg, public engagement processes, regular Roadmap refreshes, monitoring and evaluation)
Short-term outcomes
Medium-term outcomes
Long-term agency outcomes
The Roadmaps communicate key stakeholders' shared view of New Zealand's future science research and development needs and priorities
Needs/gap analysis clearly identifies the science knowledge, tools and capability that New Zealand requires and results in plans to address future needs
Science funders, providers and end users align funding decisions and capability building activities with Roadmap priorities
The Roadmaps are living documents that remain fit-for-purpose over time
New Zealand has the right science research and development capability
New Zealand produces the right science knowledge and tools
Improved uptake of knowledge and tools enhances decisions and protects end users
New Zealand has a highly dynamic science system that enriches New Zealand, making a more visible, measurable contribution to our productivity and well-being through excellent science (MBIE Vision for Science System, 2025)
The primary sector is agile, resilient and operates within sustainable environmental limits while maintaining and improving productivity and enhancing value
The capacity for the environment to sustain itself is safeguarded and the use of the environment, including natural resources, is optimised for the betterment of society and the economy now and over time
New Zealanders gain environmental, social and economic benefits from healthy functioning ecosystems
People in New Zealand make and implement decisions that benefit society, the economy, and the environment

With work to date which, since February, has involved …

- Participating on MBIE's SSIF Advisory Panel and deliberating on all CRI core funding – fascinating!
- Briefing NRS CEs and others on an implementation strategy – in progress
- Getting out there – a traveling road show around NZ – in planning
- Working closely with MBIE to ensure Roadmap considered as part of 'Impact' in Endeavour and Smart Ideas rounds in progress - encouraging
- Working with DOC Science team to assess all external Endeavour etc proposals asking for our support against the Roadmap priorities and against the Department's 2025 Stretch Goals (which includes one for freshwater) - challenging
- Internally, in DOC, asking all Science Directors to ensure budget bids are aligned with the Roadmap and with the 2025 Stretch Goals: hugely challenging

Looking ahead 10 years into the Roadmap – what have we achieved & what was different?

- Irrespective of who the Govt of the day was/is the discipline of working collaboratively within Govt is successful – I am nearing retirement!
- In DOC this meant SAW (self assigned work) went out the door 9 years ago & all science staff were/are working to the strategy leading to integrated step change research & management
- Because we were working strategically & together we were able to engage New Zealanders' 'hearts & minds' & have a healthy dialogue about new technologies & social licence – this resulted in step change research: as a result wasps have been eradicated from NZ & we have a technology for rats & possums
- Mātauranga Māori & western science are feeding off each other & the synergies are leading to huge changes in how we practice business & nurture the environment
- Apart from the ongoing & huge legacy effects of climate change we have turned huge corners already – NZ is indeed the envy of the world & has a thriving economy & environment

Thank you

Kia ora