

eResearch 2020

GLEN SLATER



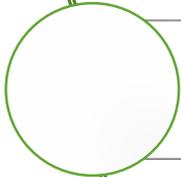
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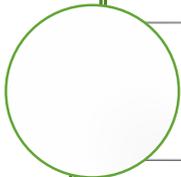
eResearch 2020



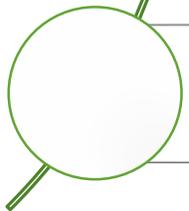
Aims to better understand the long-term ambitions New Zealand scientists have for their science, and how these inform the research strategies and infrastructure decisions of New Zealand research institutions and government.



Combines a series of interviews and opinion pieces published online at eresearch2020.org.nz and credited to contributors' LinkedIn profiles.



Includes participants from every university and CRI in NZ.



Over 50 direct contributors across all domains of the eResearch sector.



eResearch 2020 aims to better understand the long-term ambitions New Zealand scientists have for their science.

Future Infrastructure Performance



"A 2020 vision for water management might be an integrated national or regional live model and data framework for water management that accepts data from all the different agencies and organisations that contribute to this field."

– Lynley Smith

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Collaboration & Privacy



"A lot of data is analysed once, published, and then never revisited. The push is to create people who can ask clever questions with existing data and existing tools."

– Mik Black

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Investment Models & Asset Ownership



"There's potential for NZ to establish national data management within a shared centre – this would be more about economies of skill rather than scale I think. If you have data management specialists working with data on a daily basis, you're going to get a much better level of service and reliability."

– Arian de Wit

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Shared Data & Services



"Adopting eResearch and learning HPC is very much like a researcher choosing to change research fields – there is potentially a lot of downtime where they're not publishing, and not participating in their profession."

– Murray Poulter

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Sovereignty & National Capability



"New Zealand needs to remember, though, that we're living in an increasingly globalized world. That offers excellent opportunities – and I for one am optimistic about the opportunities digital technologies offer to engage with the wider world – but we can't rely on the likes of Google, or even the Internet Archive or the United Nations, to preserve and develop our culture."

– James Smithies

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Current & Diverse Opinions



"Small countries still have big problems ... if we take a backseat in the science, then we are really taking a backseat in economic development and global competitiveness."
Mark Gahegan, Auckland



"There is no guarantee that data stored in a foreign database will be available or usable in a 100 years' time."
Penny Carnaby, Lincoln



"By 2020 ... we'll have inexpensive, always connected sensors, linked to compute that can produce visualisation, most likely integrated at an international level."
Ken Gledhill, GNS



"... the idea that we generate and preserve intellectual capital just within territorial boundaries is the bane of my life..."
Sydney Shep, Victoria



"There's an assumption of benevolence on the part of large corporations that's not necessarily justified."
Richard Templar, Callaghan Innovation



"If we funded sport in NZ the same way we fund science, the All Blacks would be a pretty shit rugby team."
Keith Gordon, Otago



"To my mind, there is a case for centralised, collective investment in assets as we're too small a country to be thinking in little fragmented bits and pieces."
John Raine, AUT



"Investing in people in NZ is far more important that investing in hardware. Where it makes sense to go with a good deal from an overseas provider, we should go for it."
Blair Blakie, Otago

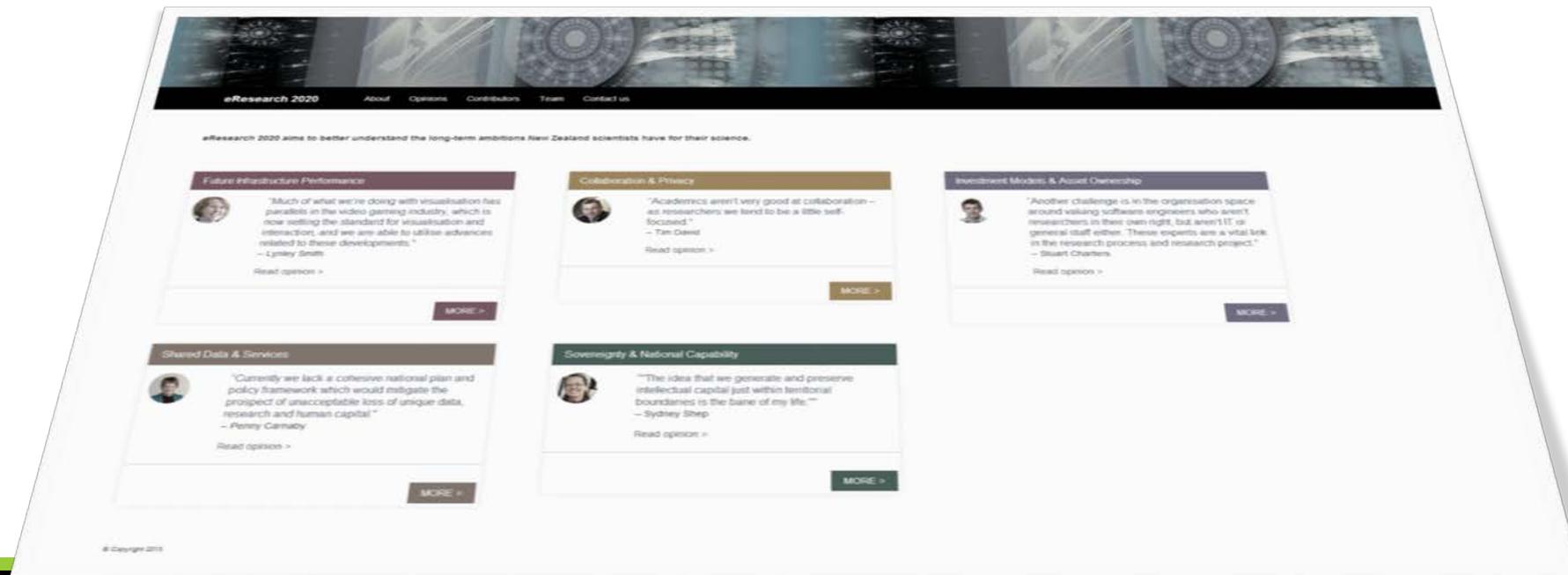
Strategic Discussion

Inputs

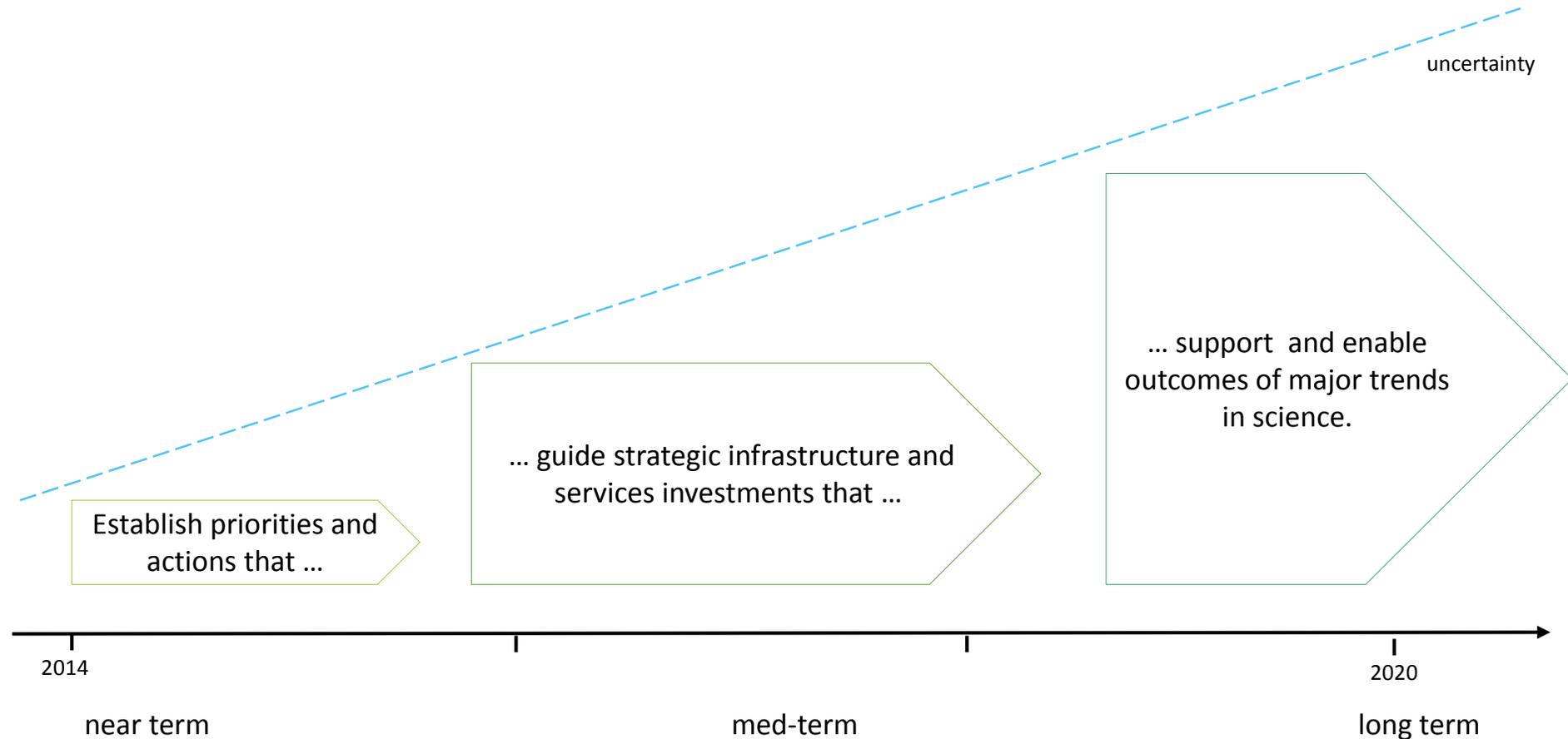
Timeframes
Owners/Funders Values and Purposes
Stakeholders Expectations and Positioning
Major Trends and Technology
Market Forces – political and economic factors

Outputs

Organisational Implications
Priorities
Optimal 2020 Vision
Major Potential Investment Areas
Technology Expectations



Developing Timeframes



Expectations & Positioning

eResearch 2020 contributions suggest a Positioning Contradiction may be limiting the ability to fulfil expectations:



NeSI as a *supra-institutional actor* and *major agent of change*; ability to act for/with government to directly influence institutions & science.



NeSI as a *subsidiary project* of the ICT departments, established to reduce costs; synchronise specialised investments & meet non-core obligations.

Major Trends & Technology

Sensor proliferation rapidly scales the quantity and quality of data produced, transferred, and stored.

Spatial data or markers become standard metadata on all other data as means of managing data.

Greater decentralisation both locally and internationally - people will have more logins, more accounts, more passwords (or their equivalent), not less.

A move towards entire system analysis (an entire pasture, an entire farm, an entire estuary, an entire city) becomes the norm for data & compute.

Increased geographical distribution of data and compute resources, activities, and users.

The end of “modelling” – a change in management and decision support expectations of technology towards “optimising” based on availability of real-time, real-world data.

A move towards real-time analysis & response enabled by visualisation technologies.

Diffusion of computation analysis out from research and into application (i.e. clinical genomics)

Vision for 2020

Decentralised, highly interoperable and discoverable data and tools across the science sector

Scalable digital infrastructure services that respond locally & internationally meet to requirements

Best in Class “Small Country” national research data methodologies and scientific practices in place across the science sector

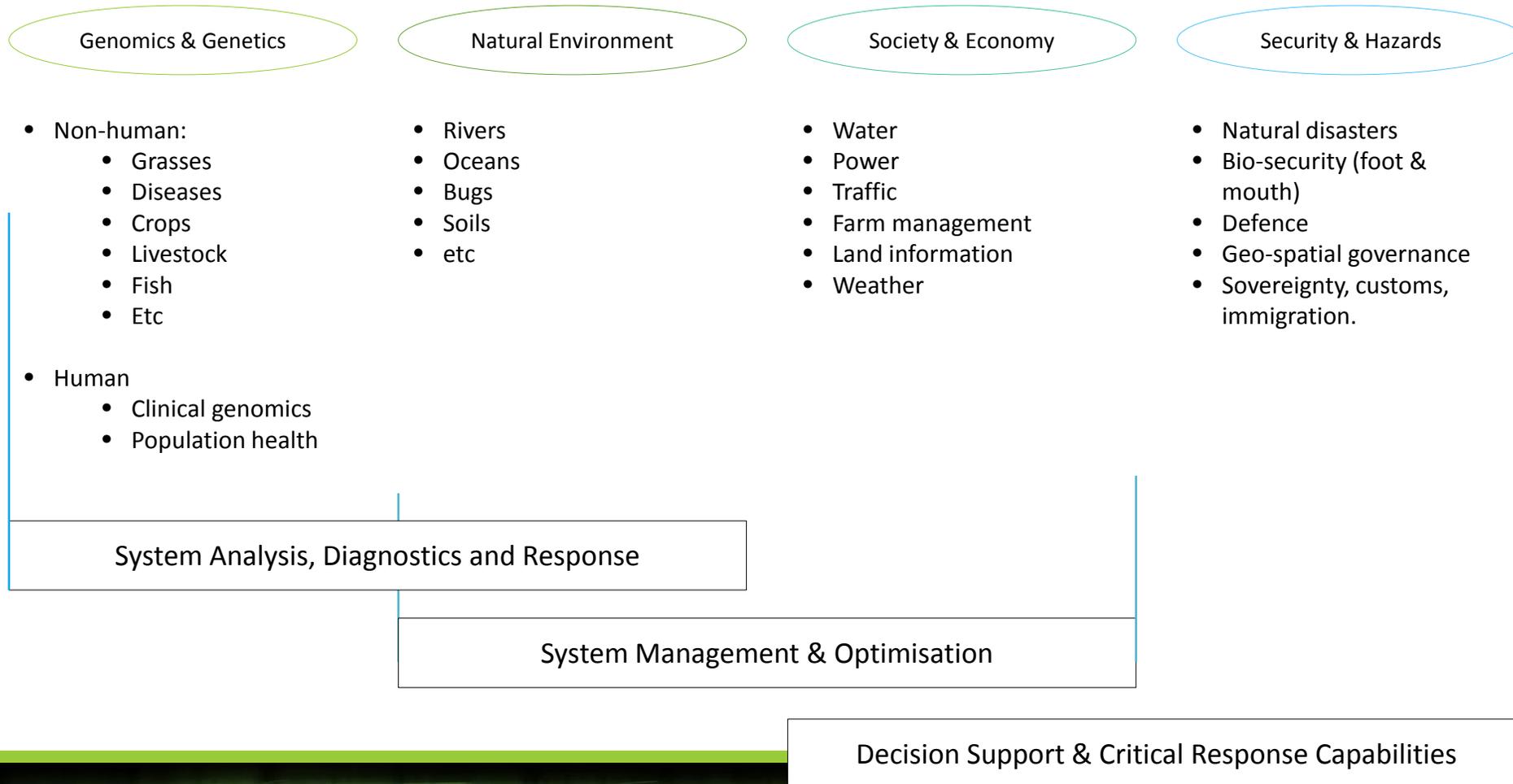
Highly responsive, data-driven decision support capability for government and industry

Highly available critical response capability for dealing with hazards

1st world “Data Informed” society and economy

No “e” in front of “research”

Areas Expecting Major Activity



Implications for Strategy & Policy

Direction

“One clear direction is that none of us want to do anything in isolation anymore.”
Nic Mair, AgResearch

Expertise

“There are few people in NZ that understand the vocab or method challenges in infrastructure.”
Andrew Watkins, NIWA

Funding

“As we move into an eResearch era, does government need to alter the priorities for funding to ensure we can capture the benefits of technology?” - *John Raine, AUT*

Wider Focus

“The original NeSI business case was very HPC focused; (NeSI) is yet to meet wider research community needs.” - *Howard Amos, Otago*

Implications for Capability

Decentralised
Interoperability

“There’s a need for NeSI or some other to take a leadership role in data interoperability and data management infrastructure at a national level.” - *Greg Jones, Landcare*

Scalability

“NZ is a very difficult place to support infrastructure (therefore) most of our contribution to world research is likely to be theoretical.” - *Gaven Martin, Massey*

Real Time

Science is too accustomed to stopping the system in order to study it, but those days are over.”
Oliver Chikumbo, Scion

Sensorisation

“There is a major spatial aspect to managing spectrum crunch in New Zealand.”
Alan Coulson, Callaghan Innovation

What's Next

- April 8th – eResearch 2020 National Strategy Workshop Day (Wellington)
- April / May – eResearch Research Institution Leadership Series
- May / June – eResearch Published findings and implications



eResearch 2020

“There’s a **sea change** in the scale of activity (in genomics)... which equates to a massive increase in data generation.”

Rob Elshire, AgResearch

“The challenge is making the most of the data & the compute, **without having them in the same**

location.”

Nikola Kasabov, AUT

“Many of the tools & standards (we rely upon) breakdown when the **data quantity goes up.”**

Andrew Watkins, NIWA

“In the past we’ve focused on creating elegant models;

today we’re less concerned with elegance **because**

we have data.”

Mark Apperley, Waikato

