The Deep South Challenge – Phase 2

Angela Halliday – Partnerships Director

Deep South Challenge

NIWA Taihoro Nukurangi | New Zealand Antarctic Research Institute | Landcare Research Manaaki Whenua | University of Otago Te Whare Wānanga o Otāgo New Zealand | Antarctica New Zealand | GNS Science Te Pū Ao | Victoria University of Wellington Te Whare Wānanga o te Ūpoko o te Ika a Māui | National Science Challenges | The Deep South | Te Kōmata o Te Tonga

Mission and Objective

Challenge Mission

The Challenge will enable New Zealander's to anticipate, adapt, manage risk and thrive in a changing climate

Challenge Objective

The Challenge will understand the role of the Antarctic and Southern Ocean in determining our climate and our future environment

Phase 1 Highlights (additionality)

- Developing climate projection capability in New Zealand, by integrating and focusing the New Zealand physical climate science community
- Co-development of research with stakeholders and end-users
- Strong Vision Mātauranga across and within the Challenge
- Better engagement with stakeholders and end-users, by including specialist engagement staff
- Diversity of climate and climate focused research, including physical and social science
- Developing integration across the research programme
- 57 papers produced

Research Highlights: Climate Impacts

National scale research on impacts of climate change on water in New Zealand

- Projections of future snow and ice cover and their impact upon water availability
- Impact of climate change on nation-wide hydrology
- Real Options Analysis which includes water storage decisions
- Emergent exposure of flood inundation hazards

Dialogue generated Sea level Rise and Insurance Research

- Climate change and the withdrawal of insurance
- Sea level rise, housing and insurance: Liability and compensation
- How should the risks of sea-level rise be shared?

Infrastructure related projects

- National Flood Risks and Climate Change – *Ryan Paulik - NIWA*
- Stormwater wastewater and climate change – *James Hughes - Tonkin Taylor*
- Making robust decisions about New Zealand's water – *Anita Wreford – Lincoln University (previously Scion)*
- Flood mitigation schemes – are they working in flood prone areas – *Patrick Walsh – Manaaki Whenua, Landcare Research*

Drought Dialogue – Research Questions

How might future droughts, in the context of a changing climate, affect future water supply and demand for food production (taking into account competition from other water users)?
a) What is the likely incidence of future multi-regional drought? What is the likely nationwide spatial pattern of expected change in drought incidence? b) What level of risk are we likely to face in relation to drinking water availability in NZ in times of drought?
What is the impact of drought on vulnerable communities? (For example: Where does labour go and does it return? What impact on your turangawaewae? What happens to local spending, income, wages and employment during droughts, and are there long-lasting effects?)
What is the impact of drought on agriculture and tourism profits, land values, food production, debt and communities?
a) What is the likely frequency of low flow conditions in a given year on specific lakes/river systems (e.g., Waikato and Clutha catchments)? b) What are the likely impacts of the incidence and length of future drought (and concurrent other effects of climate change) on electricity/energy production and consumption (incl. irrigation)

Achieving our Mission in Phase 2

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Developing Phase 2

We have identified end-user needs through:

- End-user interviews by our Partnerships Director
- Mapping end-user needs and climate research over the past 5 years
- Research co-development (e.g., Dialogues)
- Feedback from active researchers
- Collective knowledge gaps identified by the Climate Change Adaptation Technical Working Group (CCATWG)

"The Challenge's expert workshops help identify key research questions and these lead to proposals that almost immediately get funded. And I can't praise this system enough."

Scope

Physical Science

- Provide projections of future climate and climate impacts for New Zealand at meaningful scales
- Undertake observations and process studies to improve projections for New Zealand
- Analysis of international global climate models

Impacts and Implications

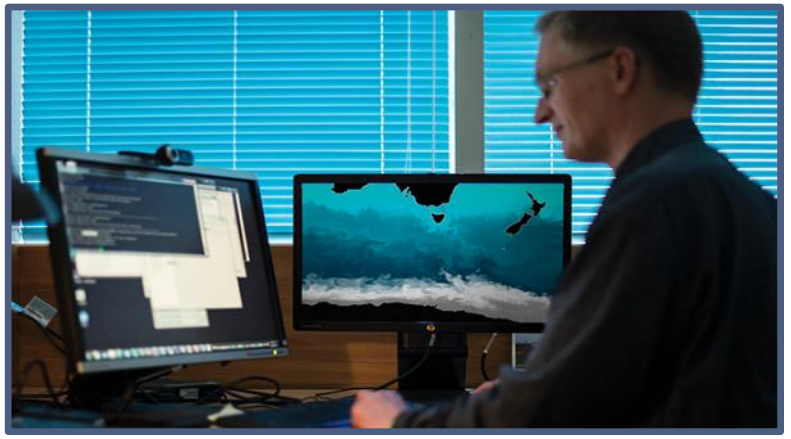
- Focus on sectors which will experience climate change impacts that are of *national social or economic significance*
- Undertake research to better understand the implications of climate change impacts for our key domains

Out of Scope

- Research for direct private benefit
- Research into the global drivers of climate change, including sources and sinks of CO_2 and the global drivers of sea level rise
- Sustained observations within the climate system
- Operational forecasting systems, including seasonal climate prediction
- Research into the response of biotic systems to climate change
- Research which does not address the direct impacts of weather extremes, floods, droughts, changes in temperature or rainfall, or sea level rise
- Research into broader, down-stream legal and political responses to prospective climate change

Climate Impacts

- Extremes
- Flooding
- Drought
- Changes in temperature and rainfall
- Sea Level Rise



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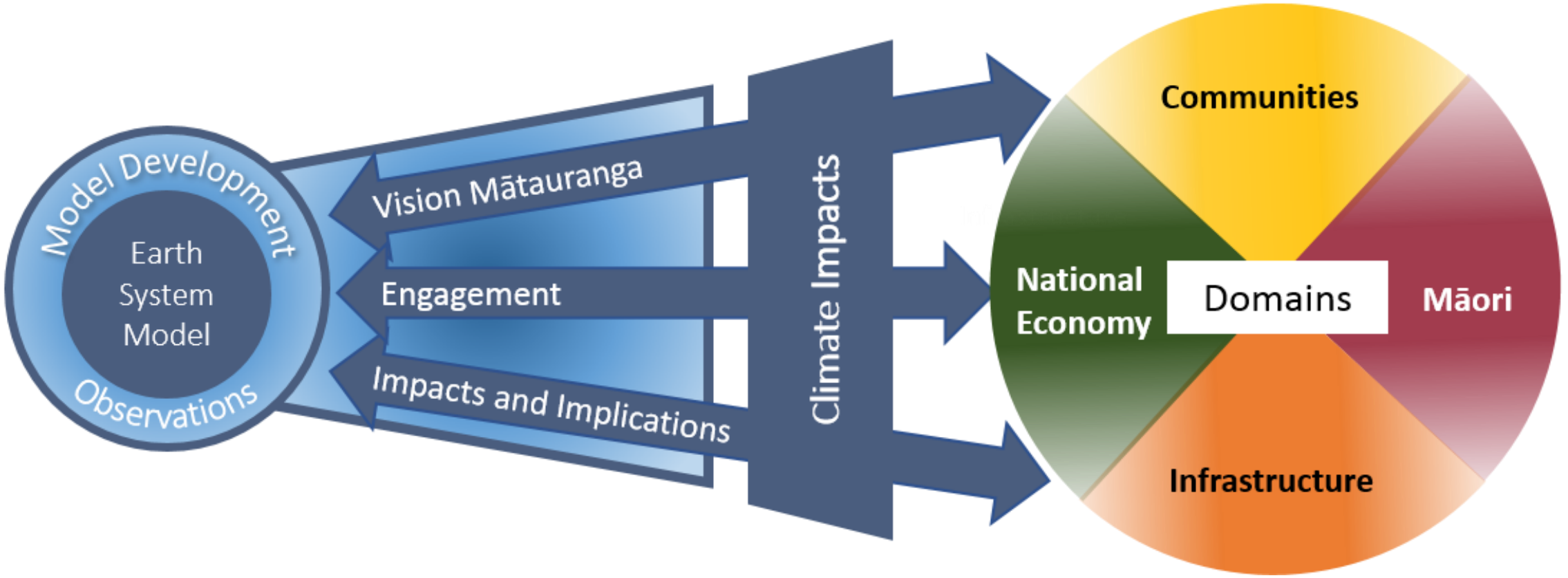
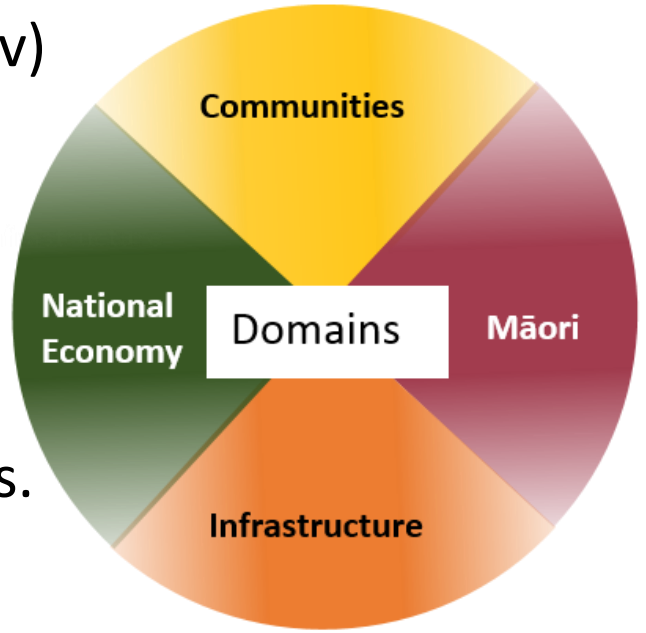
Phase 2


Model Development
Earth System Model
Observations
Vision Mātauranga
Engagement
Impacts and Implications
Climate Impacts
Communities
National Economy
Domains
Māori
Infrastructure

Future Research: Domains

Communities Domain

- Sectors (e.g., primary industry, geographic communities and local gov) most exposed to direct climate impacts to understand how they are impacted
  Likely projects: Land Suitability, Hydrology, Flood Risks & Mitigation, Tools



Infrastructure Domain

- focus on climate impacts on NZ's energy, transport & water networks.
  ***Likely projects*:** Stormwater, Flood Risks & Mitigation, Sea Level Rise

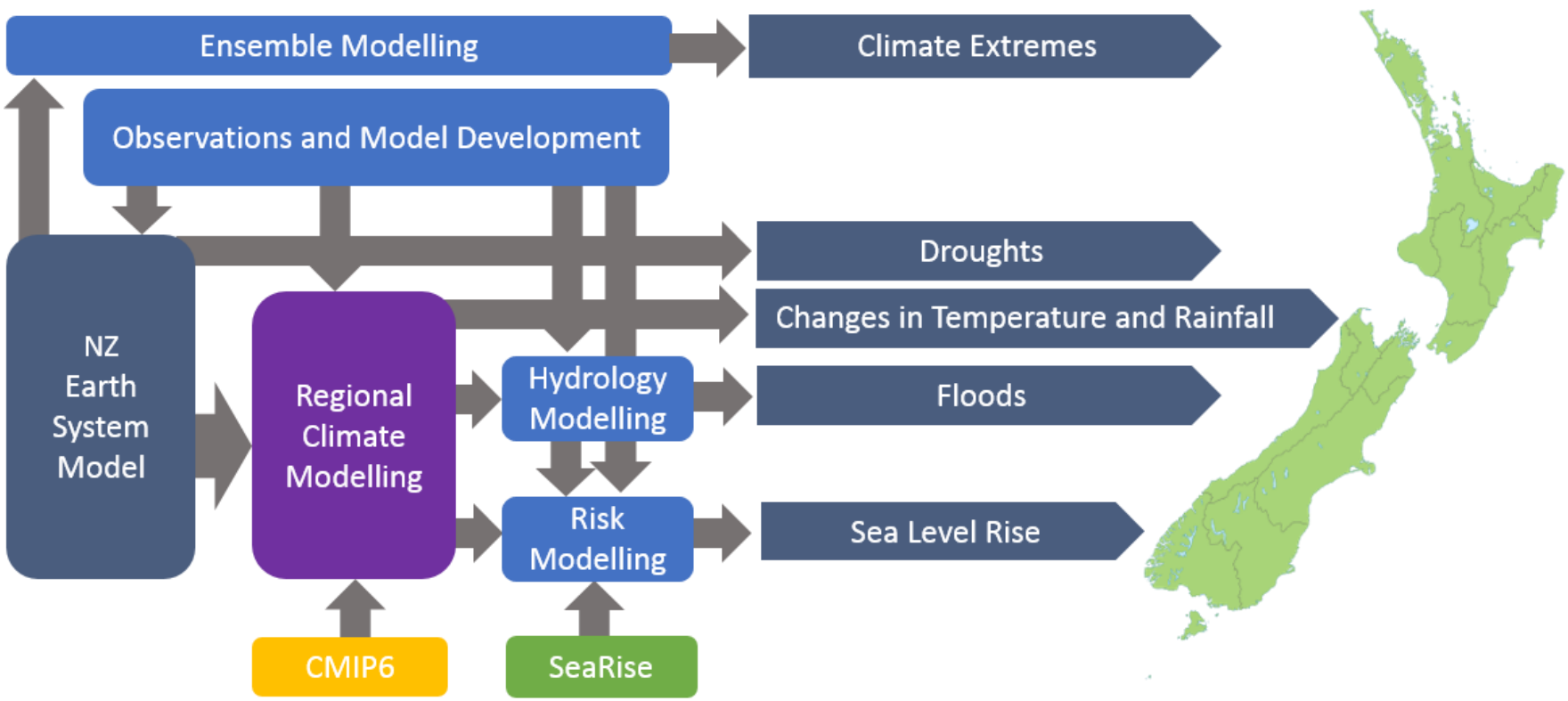
National Economy Domain

- focus on understanding macroeconomic risks to New Zealand from climate change, in particular extreme events
  ***Likely projects*:** Insurance and risk, Extreme events

Māori Domain

- focus on climate risks relevant to Māori

Climate Prediction



DSC Funded | Aligned Funding | Joint Funding | International Co-funding | MBIE Endeavour Fund

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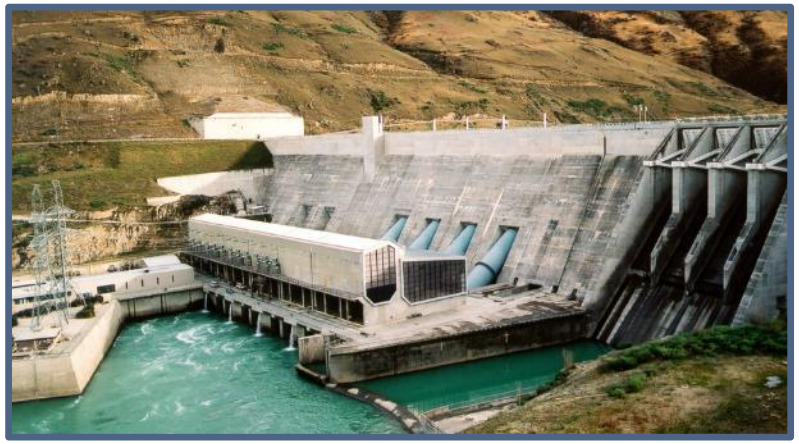
Engagement

- Engage and collaborate with our stakeholders and end-users to enable their adaptation options to be informed by our science,
- Primary stakeholders and end-users include
  - Māori
  - Infrastructure planners and providers
  - Central and Local government
  - Primary industry and rural sector representatives
  - Economic and financial sector



Integration and Collaboration

- Focus on understanding multiple Climate Impacts within each Domain
- Aiming to increase integration across the Challenge
- Greater integration of Vision Mātauranga
- Research co-creation with endusers/ stakeholders
- Collaborating with other programmes
  - Water: Our Land and Water and Better Homes Towns and Cities
  - Coastal Inundation: Resilience to Nature Challenges
  - Climate processes: Antarctic Science Platform
  - Sea Level Rise: SeaRise Endeavour

Research Mechanisms

- Specific Requests for Proposals (RFP) will support Process, Climate Impact or Domain research
- Co-development of research with stakeholders and end-users through workshops and/or Dialogues to understand implications of climate change
- Workshops to develop fully integrated research programmes
- No general contestable research rounds

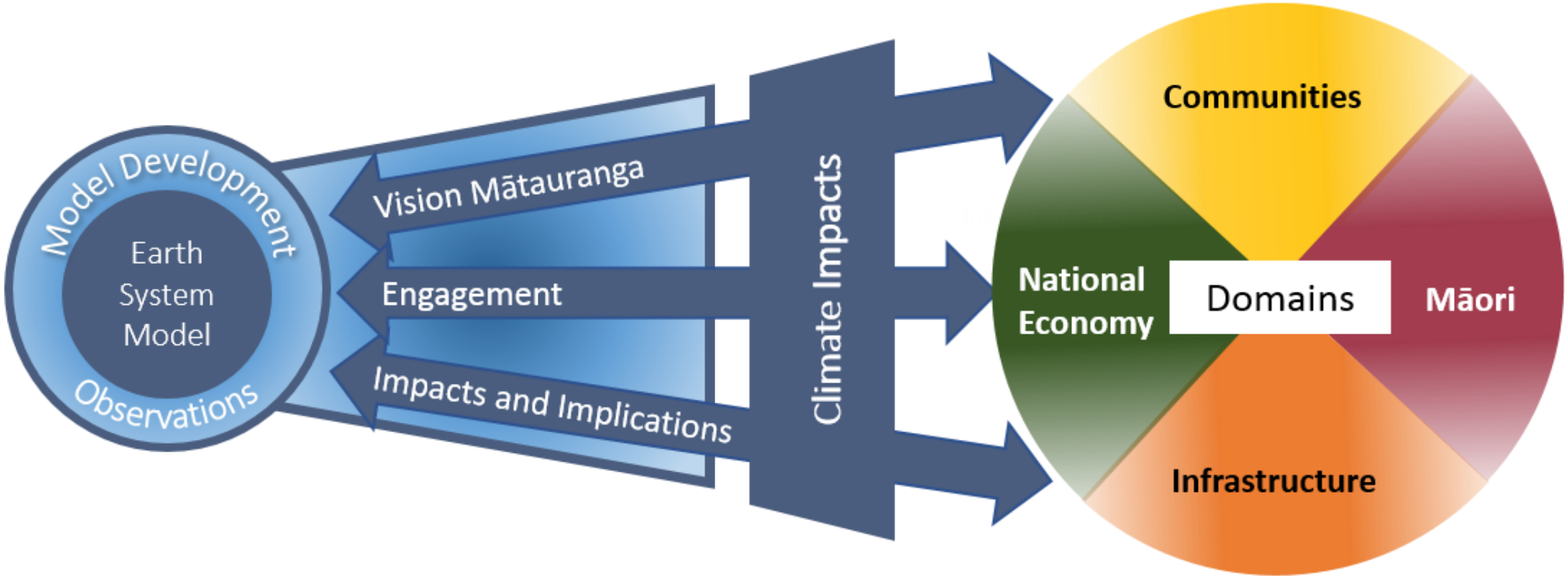
Expectations for Proposals

- Strong engagement and vision mātauranga
- Develop C&E plans which support Challenge wide communication and engagement
- Research will be funded over a range of timescales, with an expectation of review at 2-3 years for long-term projects
- Aiming to have most research completed within first 4 years to allow engagement on research outcomes in year 5
- Researcher(s) should plan to have adequate resource on proposals, i.e., not multiple researchers with small FTE's

Timeline

- Detailed workplan to be approved by Challenge Governance Group: November 2018
- Call for 1st round of Phase 2 Research (research to start 1 July 2019): December 2018
- Call for 2nd round of Phase 2 Research (research to start 1 Jan 2020): Expected June 2019
- Symposium 6-8 May 2019 in Auckland

Questions?



For more information: www.deepsouthchallenge.co.nz and our newsletter