

## **Waikato Regional Council (WRC) Science section submission to Te Ara Paerangi - Future Pathways**

Waikato Regional Council (WRC) Science section welcomes the opportunity to submit to the Te Ara Paerangi - Future Pathways Green Paper.

WRC Science section contributes to New Zealand's Research, Science and Innovation system funding as an employer of science staff, leading SoE reporting and other applied science research in the region, and funding research relevant to the region. Its purpose is to aid WRC in carrying out its RMA obligations, especially the promotion of sustainable management of natural and physical resources.

WRC Science section seeks to be part of the next stages of Te Ara Paerangi Future Pathways consultation.

WRC Science Section acknowledges that much of New Zealand's current research is of very high quality due to the current workforce, international collaborations, and scientist-end user relationships. However, we have some suggestions for improvement.

WRC Science Section supports the Te Uru Kahika (Regional Sector) submission.

### **Priorities:**

- Support national guidance for science / research priority setting but this must be outside the political cycle to be consistent and sustainable. Priority setting should be based on evidence (e.g. information from national SoE reporting giving effect to the Environmental Reporting Act)
- Adequate and ongoing funding for undertaking natural resource inventory work (e.g. S-Map and LCDB, etc.) and updating and maintaining databases of national significance are a priority for Waikato Regional Council.
  - New Zealand's state-of-the-environment monitoring datasets are currently under resourced.
  - Nationally important collections and repositories, e.g. of biota, soils, drill cores, and rock samples are minimally or not resourced.
  - Timing of updates (i.e. consistent timesteps) among those underpinning data layers would certainly be useful.
  - Alignment of update frequency and the timing of those updates of datasets would be useful for integration for SOE purposes
- Improved progression from ideation, proof-of-concept, innovation to application to business-as-usual practice. This will help overcome research sitting unused "on a shelf" or "dying in a researcher's head". Also, improved transfer of understanding from science to the Public, and improved data, information, and knowledge sharing from institutes (currently there is an issue with public funded information being captured / appropriated and commercialised, so not easily available to others)
- Support mission-led research, but "Mission" needs better definition and development with good public engagement.
  - Missions need to be longer-term, e.g. 10-yearly, and not influenced by the political cycle.
  - Missions need to be multi-disciplinary and multi-organisational, e.g. harbour system management requiring awareness of catchment wide activities, community aspiration, atmospheric / climatic influences over space and time.
- Need a stable system that can adapt in a changing world. Current system is too complex and inconsistent.

- Principles for setting priorities should be set using an open and inclusive process.
- There should be a strong evidence base for changing priorities.
- Priorities derived should be reviewed and updated.
- This process also needs to be open and clear to observers.
- WRC science section strongly supports having iwi involved in both the definition of the principles for setting priorities and the priority setting process itself
- Priorities should be focused on NZ needs and interests, but allowance is needed for contributing to “international” research, i.e. as a good global citizen.

### **Te Tiriti, mātauranga Māori, and supporting Māori aspirations:**

- Increased engagement of and outcomes for Māori.
  - Iwi want to be partners, i.e. be part of and co-owners of the research.
  - Need to recognise the journey is as important as the destination and research timelines are intergenerational.
  - Recognise that the whole environment, peoples and places are connected
  - Research / science generally has local relevance, applicability and importance, and ownership within a rohi needs to be respected.
- Better resourcing for setting up relationships and continuing relations.
- RSI resourced so that it can be embedded within iwi cultural / social structures, e.g. research / field stations located in partnership with local marae.
- Enhance the capacity for iwi to partner with researchers. This may also require that researchers enhance their capacity to work with iwi. One of WRC science section’s scientists recalled that iwi wanted to be introduced to a researchers family so that they could be assured that there was a long-term, multi-generational commitment from the researcher and that they weren’t just popping in to grab some samples and leaving an hour or day later.
- Recognise different ways of assessing scientific excellence, e.g. how are rangatahi are being trained.
- Māori can co-lead research, even without traditional qualifications.

### **Infrastructure**

- Infrastructure needs to be sustainable, i.e. long-term ongoing work and adequately funded for specialist staffing and maintenance. Includes maintaining machinery, databases, collections and repositories of national importance. Not just CAPEX.
  - Clarity of funding for ongoing maintenance, operation and staffing.
- Business cases for significant research infrastructure should include a test against benefit to NZ Inc vs simply assessing benefit to the business making the business case (e.g. CRI building infrastructure to increase competitive advantage).
- Better support for SoE reporting – we can only monitor if we have methodology to do so.
- Conceptual and numeric models to support SoE reporting need to be easily available to test for repeatable and reproducible results, and for helping project possible results of different management scenarios.
  - Several publicly funded models are now commercialised e.g. OVERSEER – how is OVERSEER and other publicly funded models to be made available? (model developed with public funding but is now commercialised and has not traditionally been open to researchers outside owners).
  - Some databases contain publicly funded data that has become commercialised and not available, even though needed for SoE reporting
- Need research stations where the research is to be applied.

- Experiences are important in addressing environmental issues, e.g. you cannot understand truly a river unless you have experienced the force of water, currents and how flowing water interacts with the wider environment.
- Nevertheless, technology will enable greater use of remote data capture at research stations
- Merging of technological and experiential approaches, e.g. Centralised institutions distributed across hyper-linked field stations. The Centralisation being a virtual construct.
- Examples of infrastructure of potential importance to WRC science section partners: WRAPS, LAWA, LiDAR

### **Partners and Stakeholders**

- Funding should relate to the problem addressed.
  - Many environmental problems are decadal and are inadequately addressed by short-term funding.
  - Consistent, robust, long-term funding is required.
  - Funding criteria need to recognise the incremental work of science.
  - Both fundamental and applied science is needed to address environmental problems.
  - Need to fund innovation and maintaining what we have.
    - Suggest base operating and blue-skies grants
- There is a lot of wasted effort if a funding bid is unsuccessful. Instead, bring competing bids together as a collaboration rather than picking winners and losers.
  - Make funding more flexible
  - Encourage ‘cooperation’ so that there is collective learning and constructive competition, e.g. the approach taken by the successful NZ’s America’s Cup Teams.
- Finding the right scientist partner can be a problem for us
  - Need to improve capacity within the research community in NZ.
  - Improve the mechanism for researchers to partner/ collaborate on research
- Scientists need to consider how will a research project impact on or be important to users.
- Needs to be early engagement with the potential users of the research so the product can be effectively integrated into the operations of the user organisation. This may require the exchange of researchers/user advocates between research organisations and end users through mechanisms such as secondments.
- RC Science Sections have relationships with other parties in the science sector not covered by this review (and not just in NZ). This is likely true of institutes and other research bodies.
  - How to include relationships with international and other parties outside the science sector?
- Experience with the establishment of multi-party programmes / services highlights the need for resilient “communities of practice” at a user level. “Communities of practice” are to help advocate for the infrastructure / asset, identify and prioritise user requirements, develop and maintain support roles, funding agreements, support processes etc.

### **Institutions**

- Some excellent research under the current system but more emphasis on applied environmental science is urgently needed. This is a question of weighting as WRC science section also recognises the need for fundamental research.
- Wicked problems require wide collaborations
  - Need collaboration rather than unhelpful competition or institutions protecting their patch
  - We need to define more clearly what each CRIs “patch” or rohe is?

- CRIs also need to get better at sharing the output of their research with relevant end users, including the public.
- Institutions need the capability and flexibility to timely respond to emerging issues, e.g. climate change impact to the environment; pathogen invasion of indigenous vegetation.
- NZ went to a multitude of competing entities in the 1990's. We suggest 3 natural resource focused institutes would be better than the current set of institutes.

### Workforce

- Regional Council science utilizes a range of scientist roles and skills.
  - RC employ people with experience and capability to do the task at hand. A PhD or MSc is a nice to have, but not a critical requirement for all roles.
  - It can take time (10+ years) for a freshly qualified scientist to gain enough world experience to really become useful in an RC setting, depending on their prequalification experience and any other qualifications.
- RCs are research procurers who require providers with the capacity to do the required work.
- Long-term security is needed. Short-term funding means job insecurity.
- Career structure needs addressing. Do we want our best scientists doing management or science?
- A multitude of skills are needed in research. Technicians, academic field, desktop and laboratory scientists and office staff are all required and need a meaningful career structure and pathway.
  - All science roles should have ways to improve and advance over a career.
  - Merit-based ways to transfer from one career path to another should be available, e.g. technician to scientist.
- WRC Scientists work closely with policy development and audit and with the regulator side of the organisation, so they have a better understanding of organisational need than an external scientist / consultant; an understanding whose value increases overtime with experience. Because of their science background, the WRC scientist is also in a prime position to engage with the RSI sector to help define the RSI user organisational needs and interests.