TP2: Field Testing and Monitoring

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Deputy Leaders: Quincy Ma and Geoff Rodgers

The aim of this Technology Platform is to provide a basis for the efficient implementation of field-based research projects, the development of standardised method statements and software, and effective training of researchers. This Technology Platform will build on New Zealand leadership in field testing and monitoring to further the development of capabilities in these areas. Experimental field testing and monitoring equipment at several QuakeCoRE institutions is currently being utilised by researchers for multi-institutional research, and strong partnerships with stakeholders means that the New Zealand environment provides researchers with access to infrastructure at a level that is not available internationally.

Key research thrust areas

There are two key thrust areas in this Technology Platform:

1. **Field Testing:** This thrust area focuses on streamlining the utilisation of field testing resources, the development of efficient field testing logistics and development of capability.

2. **Monitoring:** This research thrust area focuses on the development of structural and geotechnical monitoring arrays in New Zealand and the usage of their data. This Platform will collaborate GeoNet in the development of future building instrumentation and promote/advocate for the installation of further downhole seismic arrays.

Overarching objectives

The key objectives for this platform are:

The efficient implementation of field-based research and monitoring projects.

The development of standardised field testing methodologies and testing documentation protocols and software to assist in real-time acquisition of data: A database of field testing and monitoring equipment available to QuakeCoRE researchers is available here.

The development of methodologies and software for post-processing and database management of data: Working in conjunction with TP1 and TP3 we will develop standardized workflows for data processing and analysis to improve the efficiency implementation of projects. In the geotechnical space raw site characterisation data is managed by the NZGD, therefore QuakeCoRE will focus on a higher level database of information collated from research and extracted from the NZGD.

The training of researchers in the use of equipment and application of methodologies: Training and/or collaboration with experienced researchers will ensure proper use of equipment and will develop the New Zealand knowledge base.

Development of advanced field testing capabilities to support research: Advanced field testing equipment and procedures should look to push beyond or function at the high-end of current practice. For geotechnical applications this includes: equipment and procedures for recovering undisturbed soil samples, and devices, transducers, methodologies and procedures for measuring key parameters for site characterization.

Personnel

The QuakeCoRE staff for Technology Platform 2:

Andrew Stolte, Field Research Engineer

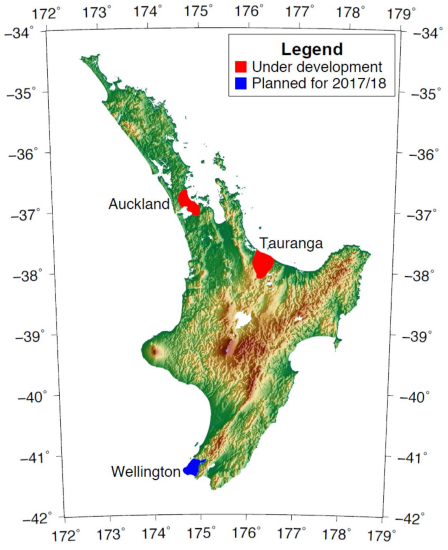
Key performance indicators

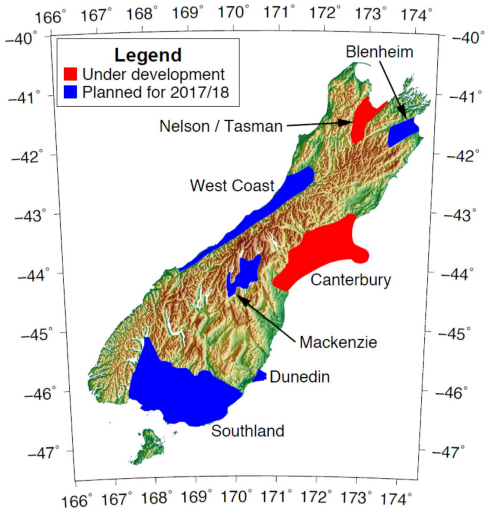
KPI	Start Date	Due Date	Q2 Report
TP2.1: Develop framework for efficient implementation of geophysical field testing.	1/6/2016	31/6/2017	Complete
TP2.2: Develop and implement University of Canterbury building monitoring systems in partnership with GeoNet.	1/6/2016	31/2/2017	Complete
TP2.3: Development of direct-push crosshole methodology and implementation (w University of Texas)	1/6/2016	31/6/2017	Complete
TP2.4: Develop QuakeCoRE best practice guidelines and software for active geophysical testing and monitoring	1/6/2016	31/12 /2017	Complete
TP2.5: Development of Instrumentation and signal processing training (with TP1)	1/12/2016	30/6/2018	Delayed
TP2.6: Develop QuakeCoRE post earthquake reconnaissance strategy	1/1/2017	30/6/2018	Delayed
TP2.7: Develop a repository and guidelines for field testing and monitoring data and metadata archiving	1/3/2017	31/8/2018	On Track
TP2.8: Development of efficient tools to interact with GeoNet BIP database.	1/3/2017	31/12 /2018	On Track
TP2.9: Development of geophysical field investigation training materials.	1/1/2018	31/12 /2018	On Track
TP2.10: Development of large scale field testing guidelines and capabilities (with TP1).	1/1/2018	30/6/2019	On Track
TP2.11: Develop post event structural and geotechnical monitoring strategy with GeoNet.	1/1/2018	31/12 /2019	On Track
TP2.12: Development of central repository of pertinent information on instrumented structures in New Zealand.	1/1/2018	31/12 /2019	Not Started

TP2.13: Development of QuakeCoRE best practice guidelines for geotechnical sampling and investigation.	1/1/2018	31/12 /2019	Not Started
TP2.14: Develop QuakeCoRE best practice guidelines and software for passive geophysical testing and monitoring.	1/6/2016	31/12 /2019	On Track
TP2.15: Develop QuakeCoRE capabilities in a wider set of geophysical site investigation methods for application in an engineering context.	1/1/2018	31/12 /2019	On Track
TP2.16: Implementation of low cost building instrumentation into GeoNet monitored buildings and assessment of performance capabilities.	1/3/2017	31/12 /2020	On Track
TP2.17: Development of research memorandum of understandings with international research organisations in relation to field testing.	1/1/2018	31/12 /2020	On Track
TP2.18: Identify and assess the potential for implementation of new field testing techniques that will enhance QuakeCoRE capabilities.	1/1/2018	31/12 /2020	On Track

Field Testing Projects:

A summary of current and projected regions where QuakeCoRE field testing projects are being undertaken are summarised in the figures below.





2018 RfP Information

No applications or Expressions of Interest (EOI) are being sought via the RfP. The Technology Platform Leaders are responsible for delivering a long-term coordinated Technology Platform Programme; investigators are encouraged to engage with the Technology Platform Leaders to see where they may contribute to the Technology Platform Programme.