

Nelson-Tasman Geotechnical Site Classification Study

Rebecca McMahon – *ME Student*

Liam Wotherspoon – *University of Auckland, Project Supervisor*

Planning and Funding:

Andy Reid – *CGW Consulting Engineers*

Paul Wopereis – *MWH Richmond*

Sally Hargraves – *TerraFirma Ltd – Geotechnical Engineer*

Bruce Mutton – *NCC*

Glenn Stevens – *TDC*



Aim of the Nelson-Tasman Site Classification Study

- Define geotechnical dynamic site characteristics across the Nelson-Tasman region
- Collect and interpret geotechnical and geophysical data
- Develop maps of subsoil characterisation metrics



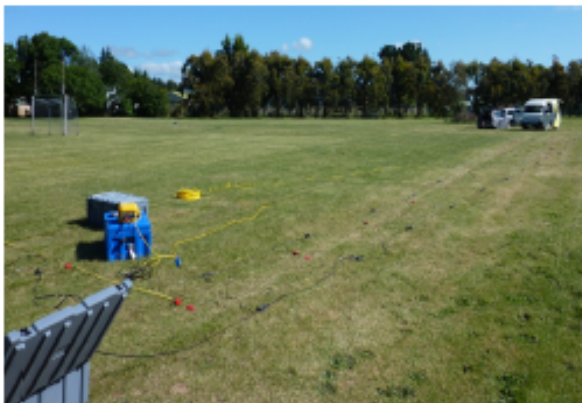
Preliminary Mapping of Site Class



Geophysical Data Collection

Collate a geospatial summary dataset of site characterisation metrics across the region and define representative shear wave velocity-depth relationships for regional soil deposits.

Site period estimated using H/V spectral ratio – broadband seismometers



Co-funding Effort and Support

- Liaison with local consultants and Nelson City Council/Tasman District Council.
- Presentation to Nelson/Tasman Civil Defence.
- Discussion and further plans for potential testing for regional developers.
- Outreach activities and proposed events for 2017 to promote QuakeCoRE research to wider community.



Broadband Seismometer Testing Locations

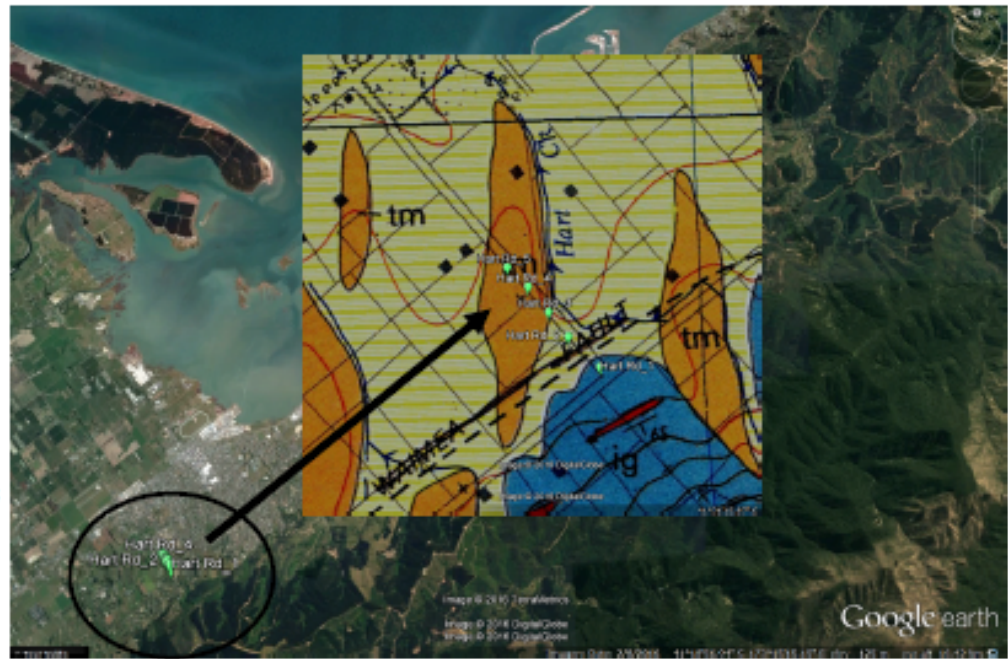
Seismometer set up and run for 1-2 hours at each location.

60 Locations completed to date



Broadband Seismometer Testing Locations

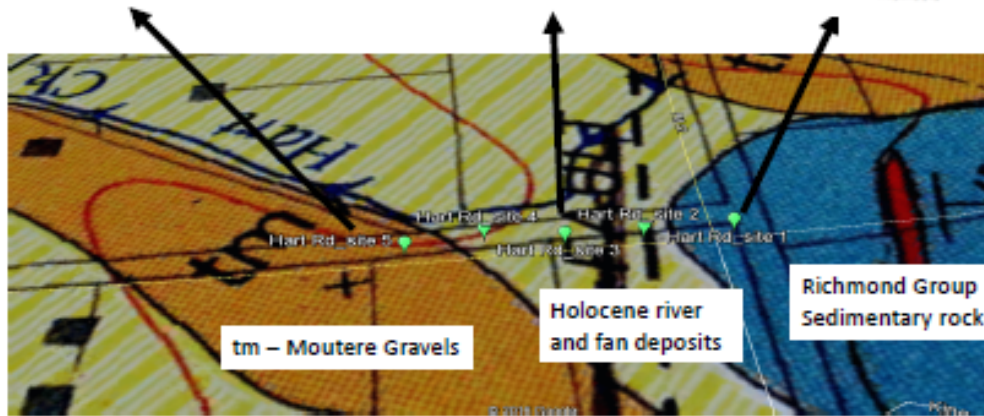
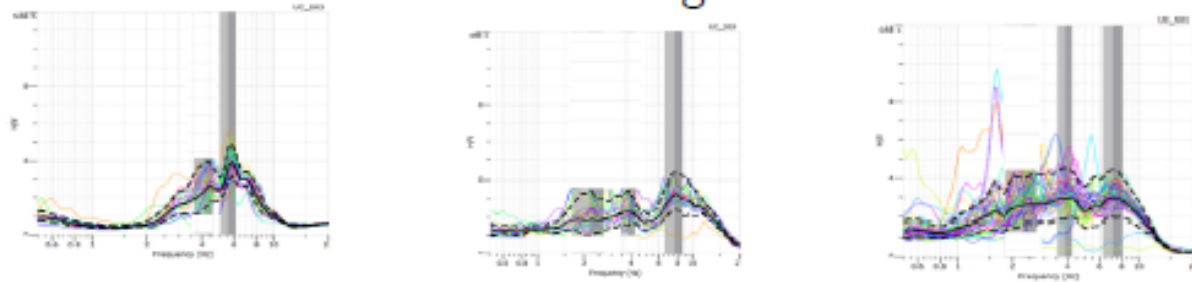
Lines of Broadband seismometers set out from the foothills



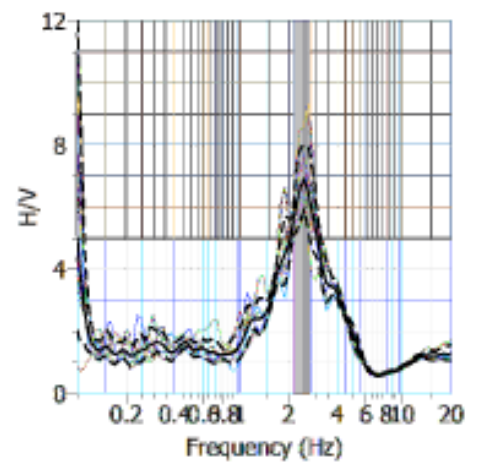
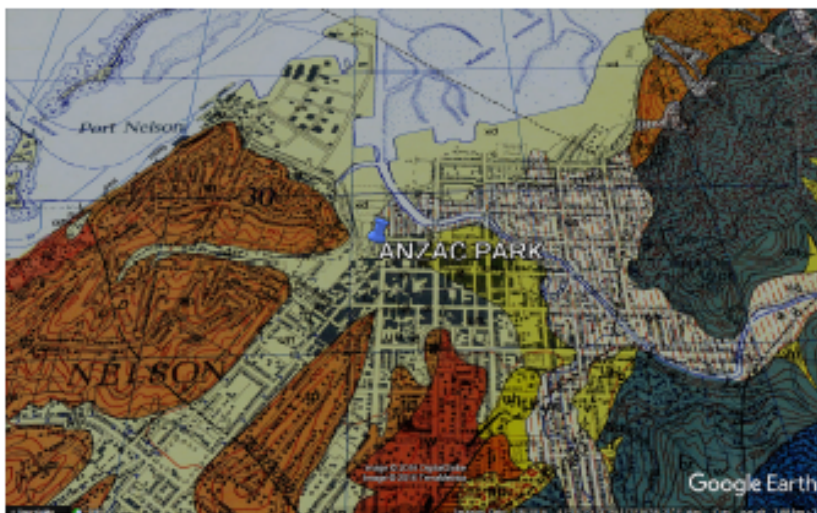
Broadband Seismometer Testing Locations - Case Study



Broadband Seismometer Testing Locations - Case Study



ANZAC Park



MASW Testing Locations

MASW locations completed over the summer.

Around 25 sites completed to date.

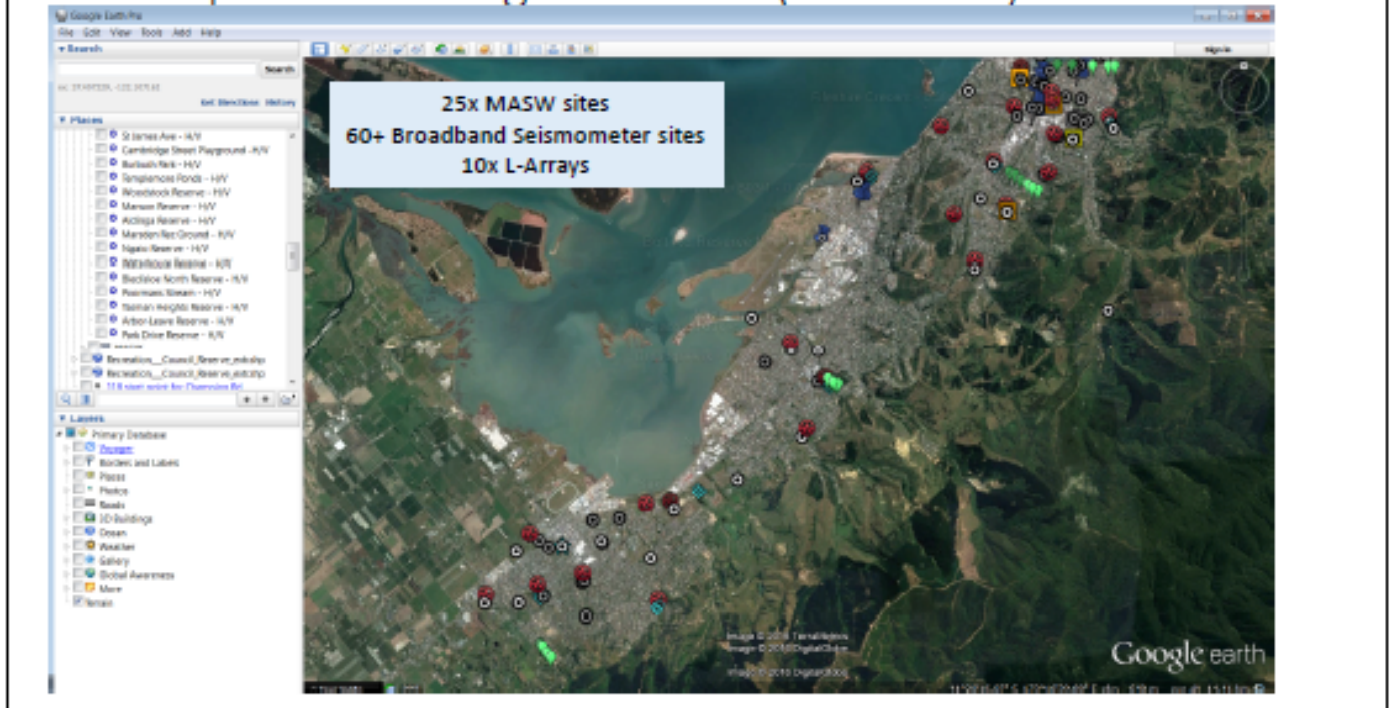


L-Array Testing Locations

L-Array locations, 10 locations completed to date.



All Completed Testing Locations (Feb 2017)



Next Steps:

- Processing/Interpretation of data
 - Vs depth models for regional deposits
- Identifying particular areas of interest to focus further testing (or SI) as needed
 - Subsurface and surface (2D Arrays)
 - Co-funding
- Discussion and further plans for potential testing for regional developers --> Stakeholders

Active: ~25m max depth
L-array: ~60m max depth



Expected Outputs for 2017:

- Objective 1 (Shallow Characterisation)

Liam Wotherspoon, Rebecca McMahon

- Develop and publish the first detailed dynamic site characterisation dataset in the Nelson-Tasman region (Journal).
- Provide dataset of testing information to enable improved site sub-soil classification
- Data to feed into regional ground motion simulation efforts.

- Objective 2 (Deep Characterisation)

Brendon Bradley, Francesca Ghestti

'Deep' geophysical and geological regional characterisation of sedimentary and metamorphic soil/rock deposits and integrated development of a Nelson/Tasman velocity model.

