

The Resilience of NZ Ports

Motivation

- “ Complex facilities
- “ Ports vulnerable to multiple natural hazards
- “ Limited research on ports in general and NZ ports specifically
- “ Economic importance (99% imports/exports)
- “ Critical lifelines (CDEM Act)

Participants

“ Research team

- . University of Auckland
- . GNS Science
- . eCoast & Mulgor Consulting
- . Riskscape

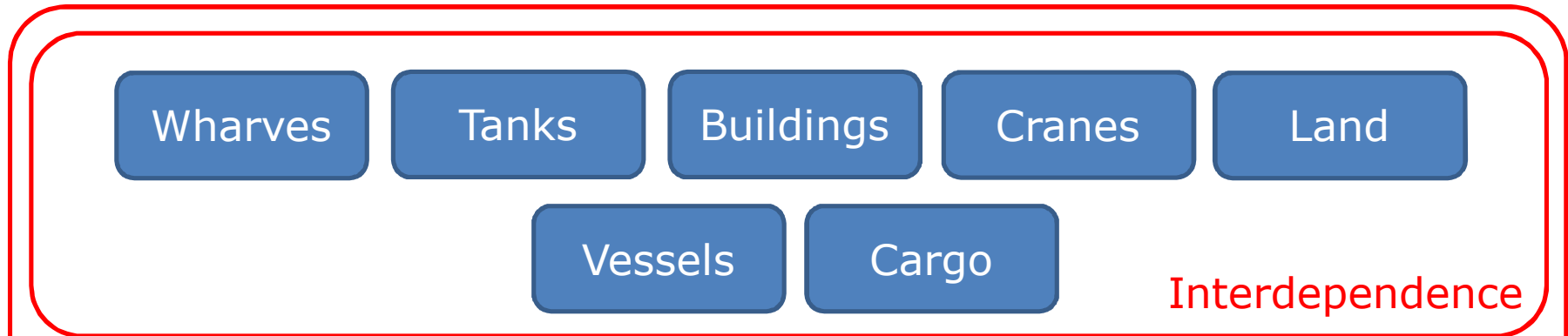
“ End user engagement

- . Port CEO's group
- . Port Engineers group
- . Auckland Council

Scope

- “ Resilience of NZ Ports to natural hazards
 - . Port components
 - . Individual ports
 - . Overall network

Scope



Individual Port



Network

Port Characterisation

- “ Develop overview of current characteristics
 - . Physical & economic
- “ Create representative NZ infrastructure typologies
 - . Wharf, tank and soil profiles
 - . “Virtual” port

Current Activities-Seismic

- “ Wharves and tanks
- “ Soil-foundation-structure modelling
- “ Development of fragility curves for representative NZ port infrastructure
- “ Verification using NZ case study data

Current Activities-Tsunami

“ Wave and debris impact

- . Physical modelling
- . Effect of structure stiffness

“ Wave, debris impact, currents

- . Fluid-structure-foundation-soil modelling and fragility curves for representative NZ wharves

Current Activities-Tsunami

” Decision making Tool

- . Real time assessment of onset time, severity and duration of water level, currents and surges
- . Analysis of available NZ tsunami wave data at select ports and numerical modelling