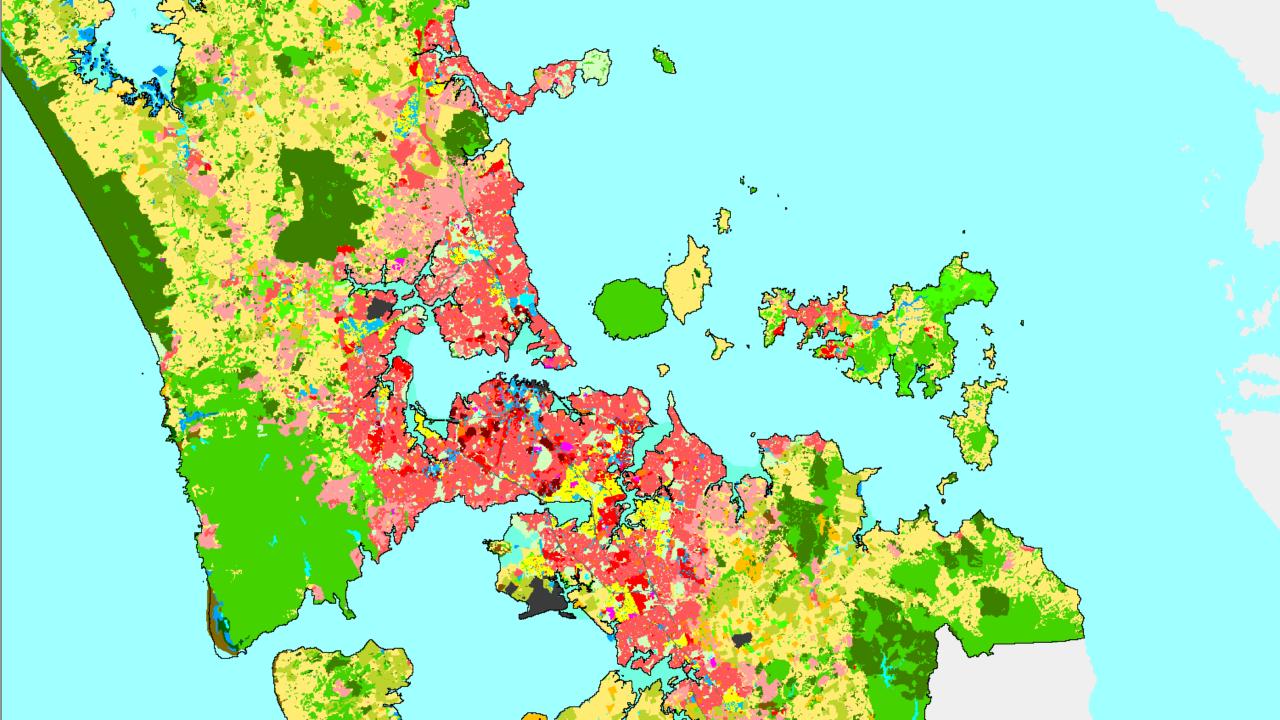
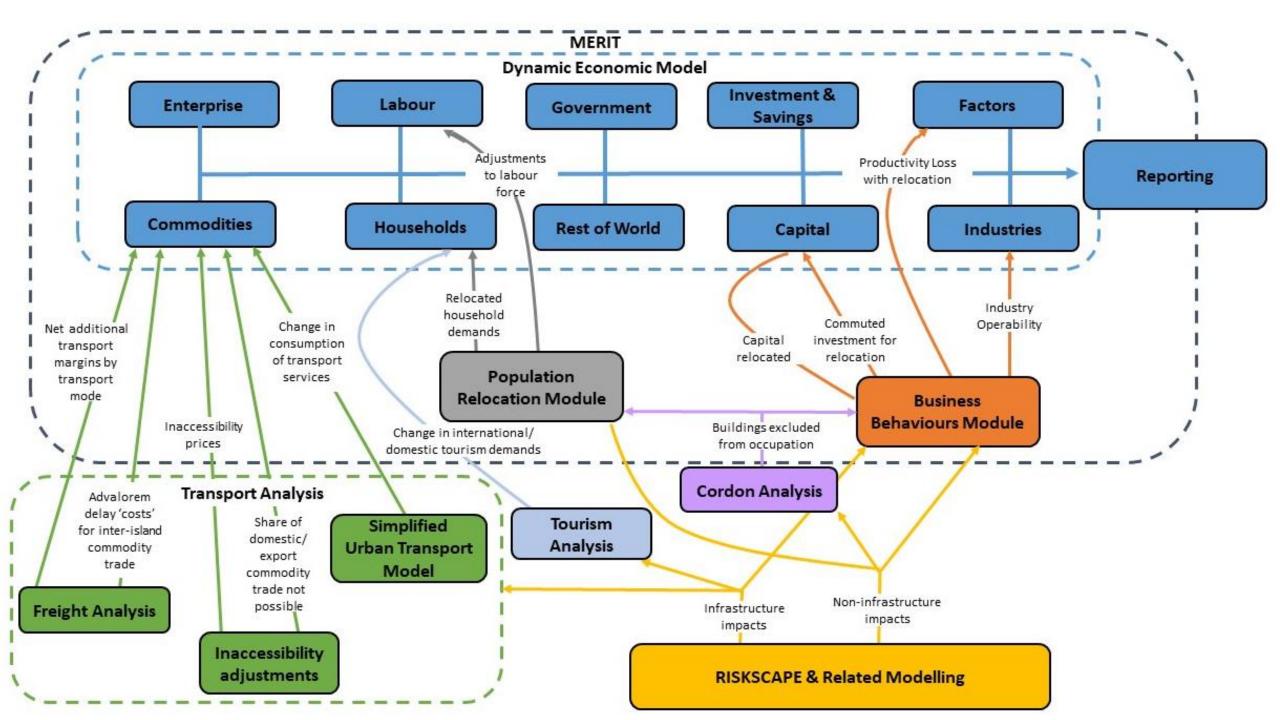
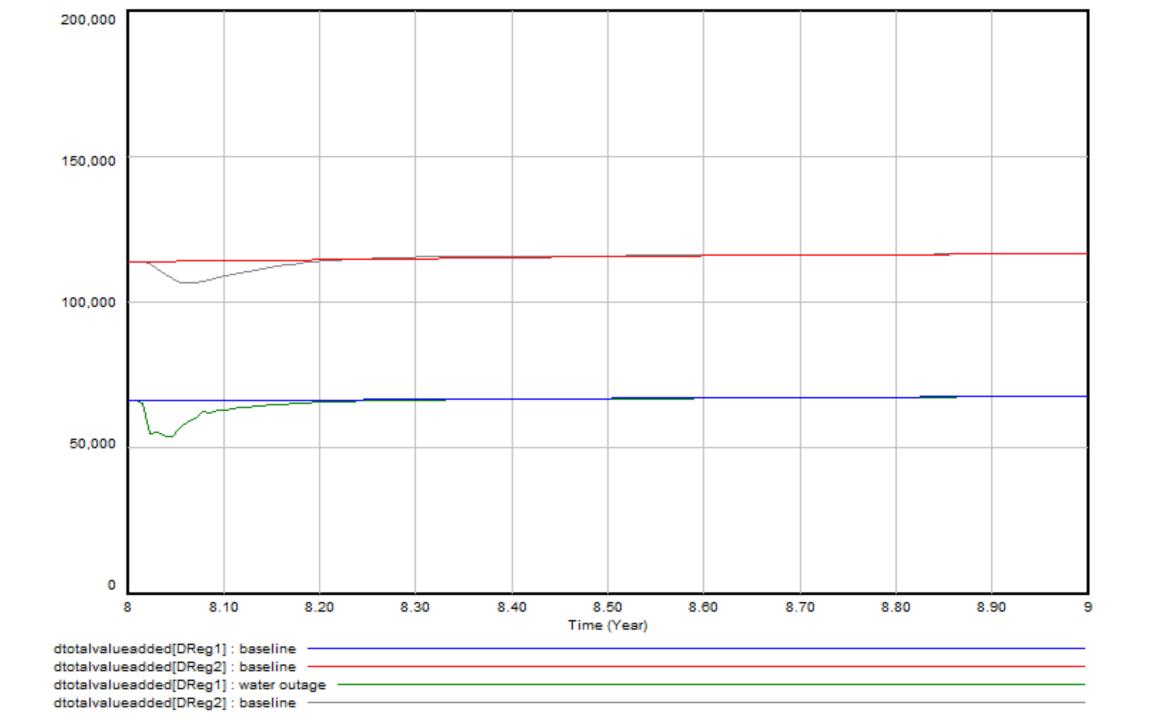
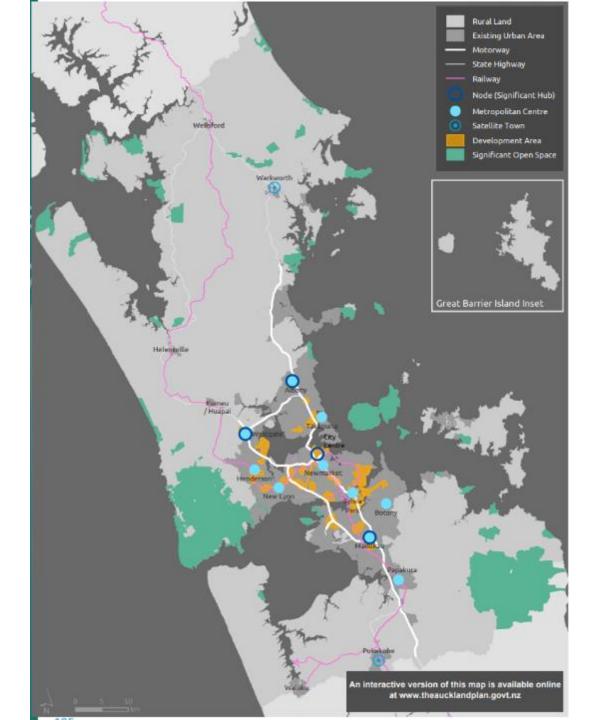
Application of Integrated Land Use – Economic Models to Hazard Management Strategy and Planning

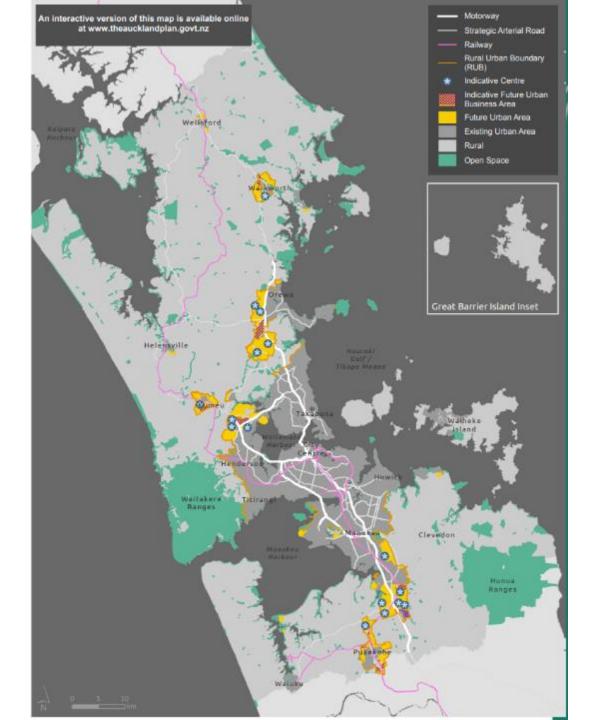




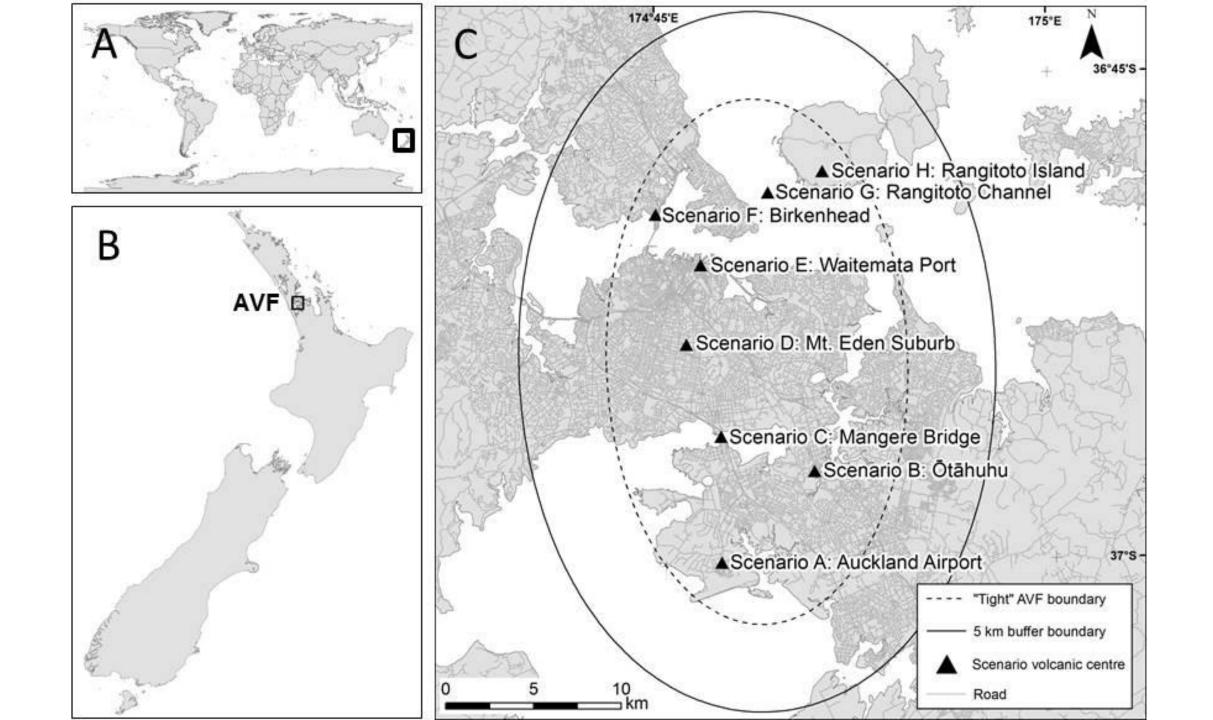








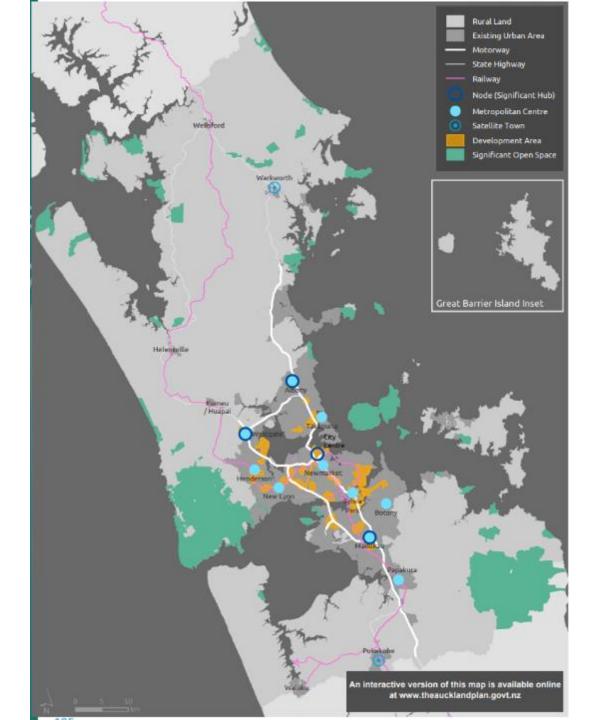


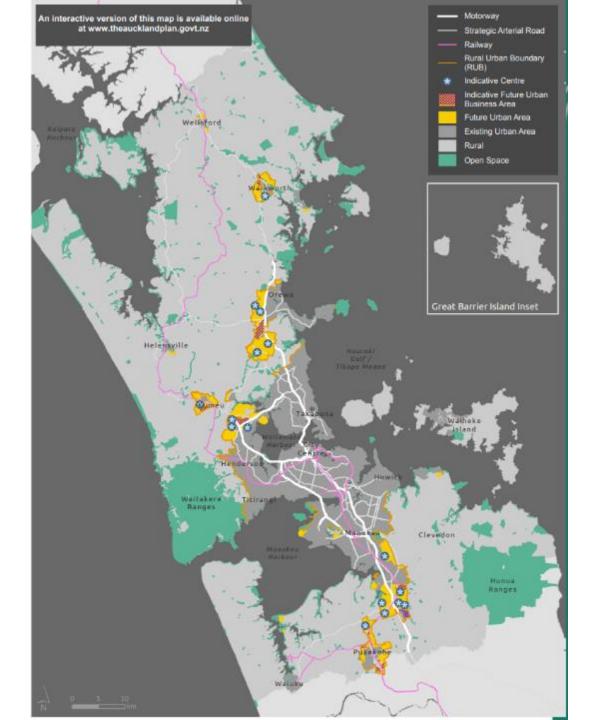


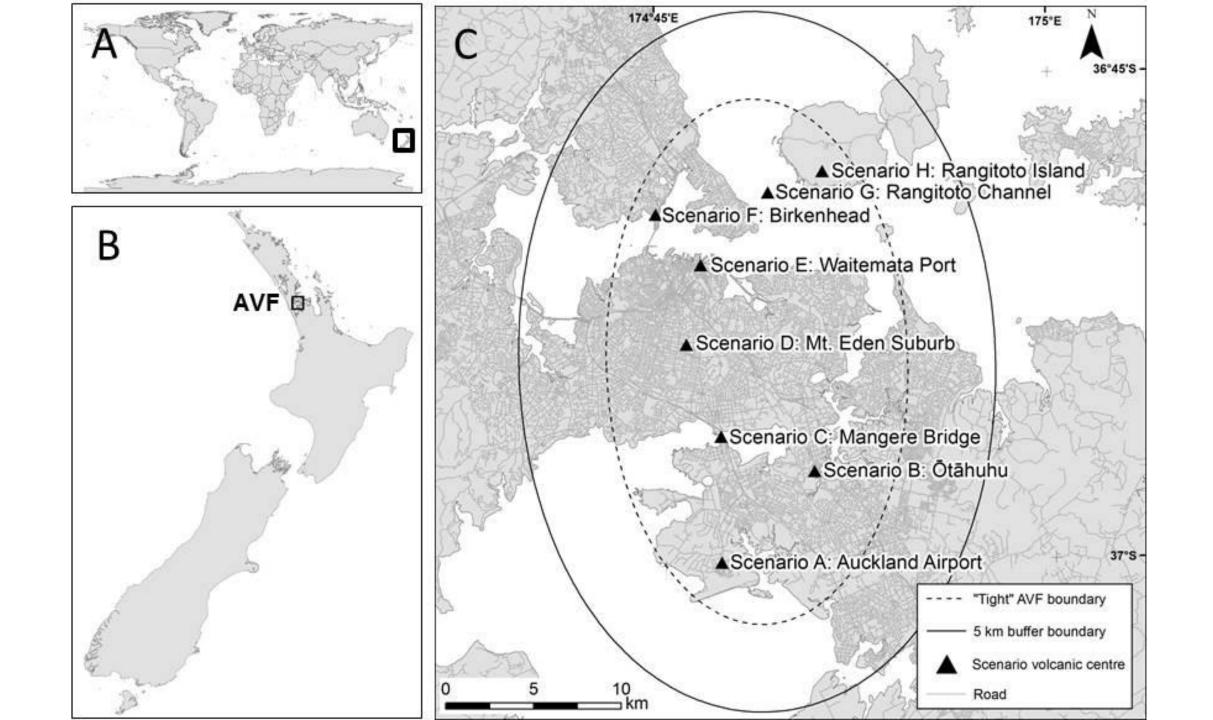
Objectives

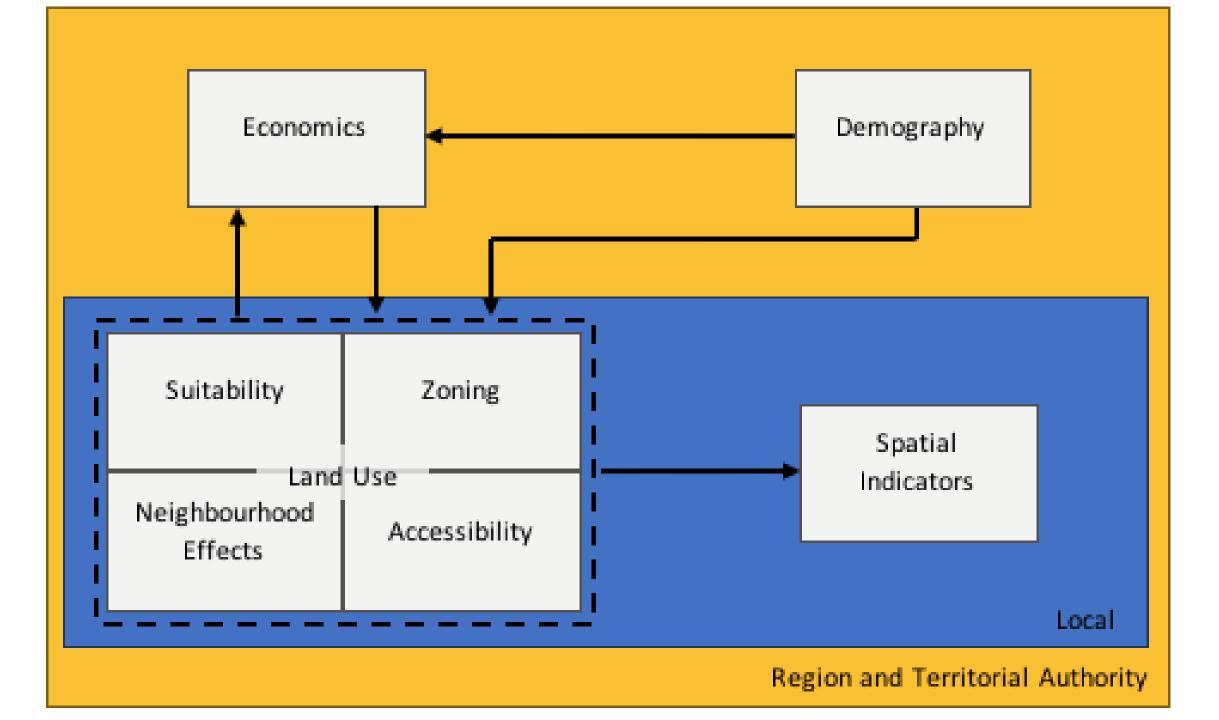
Investigate how volcanic hazards can affect urban and economic development

- Before the event occurs how does risk (potential impact) change over time?
- How might urban development post hazard event be affected?
 - Displacement of land use
 - Suitability of whole areas affected by infrastructure disruptions
- Illustrate the links between technical design decisions with overall wellbeing of society.
- Note we are starting with a very basic analysis → gradually build up the level of detail and complexity of problems / questions explored

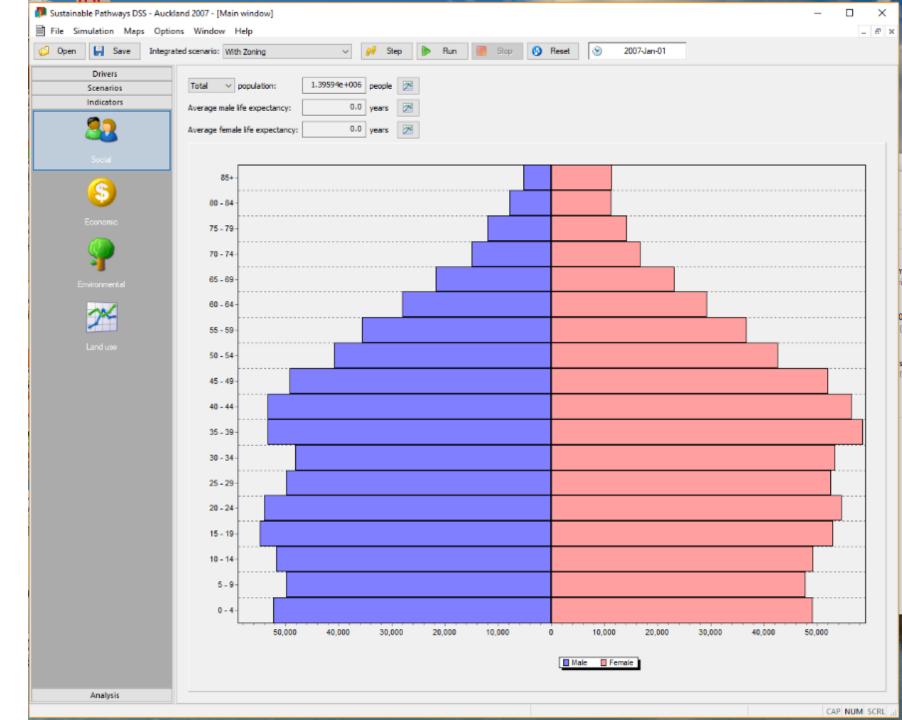








Population

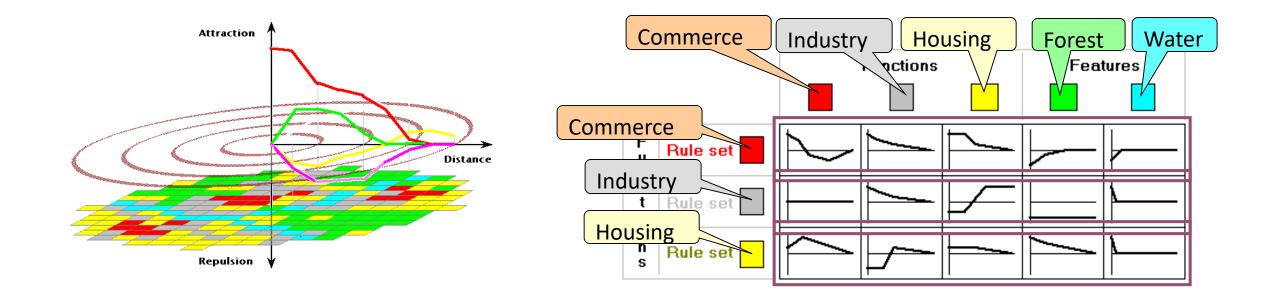


Sustainable Pathways DSS - Auckland 2007 \times File Simulation Maps Options Window Help Step Reset \odot 2007-Jan-01 Open 🚽 Save Integrated scenario: With Zoning Run \sim Sector names Sector filter Sector - land use correspondence Consumption Demand Land use constraint Supply Indicators Input Time: 2007-Jan-01 V Add time... Remove time Sector International exports [mln \$(2007)] Interregional exports [mln \$(2007)] Gross fixed capital formation [mln \$(2007)] Changes in inventories [mln \$(2007)] 🛆 Horticulture and fruit growing 65.4444 32.8982 1.1812 1.51334 1.0937 49.2854 0.15372 1.59863 Livestock and cropping farming 0.4244 12.1031 0.457456 Dairy cattle farming 0.0842621 8.99626 48.6974 0.644486 0.898839 Other farming Services to agriculture, hunting and trapping 2.43356 4.12364 9.04911 2.79502 Forestry and logging 19.798 4.29285 0.0878975 31.8762 42,1014 Fishing 6.74202 0 0.264191 Mining and quarrying 86.0522 35.5075 26.9624 10.0998 Parameters Inverse Leontief matrix: Mining and q... Oil and gas ex... Meat and mea... Dairy product ... Other food m. Sector / Sector Horticulture a... Livestock and ... Dairy cattle far... Other farming Services to agr... Forestry and I... Fishing 1.0234 0.00607817 0.00350412 Horticulture a... 0.00482218 0.00293803 0.00517115 0.00112527 0.000203151 7.74063e-005 0.00017707 0.00315984 0.01245 Livestock and ... 0.0033469 1.00709 0.00225018 0.00165324 0.00135526 0.000200352 6.77806e-005 2.93795e-005 4.80999e-005 0.0218958 0.00223618 0.001187 0.000362662 0.000662934 1.00038 0.000235286 0.000268379 4.27979e-005 1.90201e-005 8.15214e-005 2.68096e-005 0.00131299 0.0412408 0.0006077 Dairy cattle far... 0.00489948 0.00253799 1.00706 0.00326119 0.000395765 7.16645e-005 2.98894e-005 7.01329e-005 0.00824078 0.00287761 0.001343 Other farming 0.0057712 0.0396241 0.0333149 0.0223169 0.0174506 1.04848 0.0719479 0.0131681 0.000180534 0.000533946 0.00693702 0.00252443 0.001190 Services to agr... Forestry and I... 0.00279975 0.00256447 0.00213759 0.00154135 0.0525494 1.24853 0.0018984 0.000424122 0.00101143 0.0007583 0.000445771 0.001358 Fishing 2.39077e-005 1.62246e-005 3.02205e-005 7.23575e-005 1.93831e-005 1.62788e-005 1.05042 0.000204007 0.000206806 2.07149e-005 4.04027e-005 0.003533 0.00157884 0.00746036 0.00300091 0.00271964 0.00057462 0.00036195 0.00102222 0.00095134 0.001389 > 0.00121548 1.0363 0.037882 Mining and g... < 1 > Output ~ Sector Unconstrained final demand [mln \$(2007)] Unconstrained output [mln \$(2007)] Horticulture and fruit growing 147.291 230.895 53.6274 85.4096 Livestock and cropping farming 57.6106 Dairy cattle farming 13.2091 Other farming 65.0927 88.1697 Services to agriculture, hunting and trapping 20.904 106.117 65.6819 225.146 Forestry and logging 53.7603 66.7986 Fishing Mining and quarrying 164.174 373.935 Oil and gas exploration and extraction 0 - U 700.007 705.07

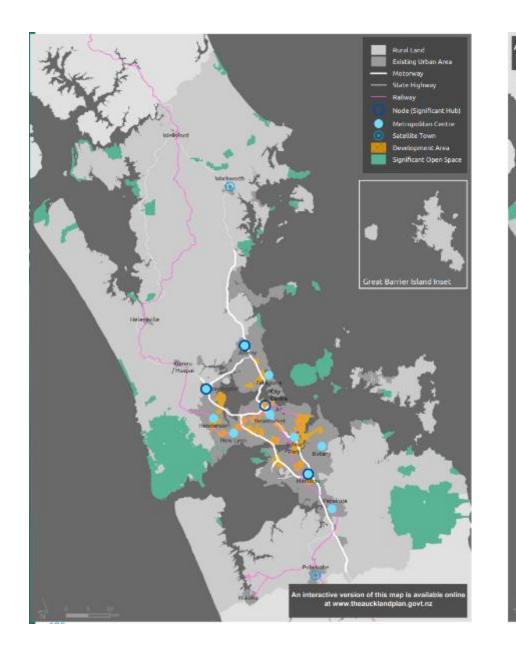
Economic Activity

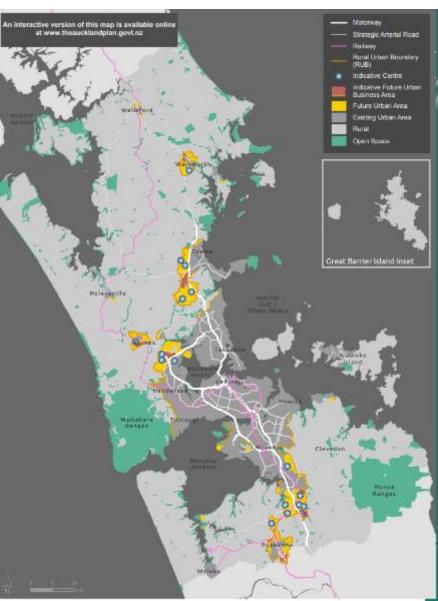
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Neighbourhood Effects

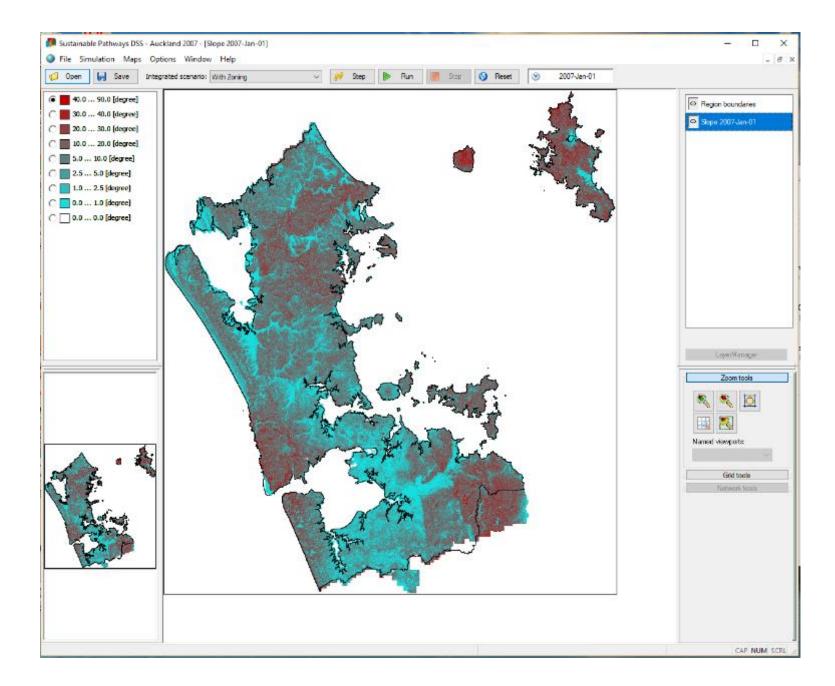


Zoning





Suitability



Accessibility (Transport)



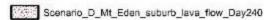
Indicative Results / Early Outputs

Legend

Substation
PDC_NZTM
Transmission_Lines
designvolt
110
220
400



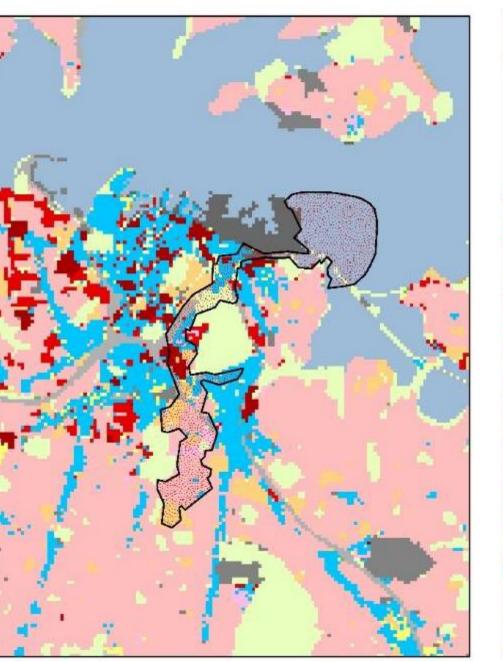
Legend

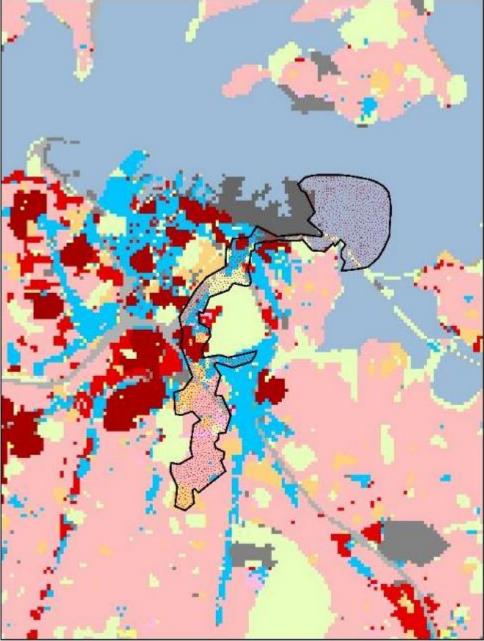


land_use_180528



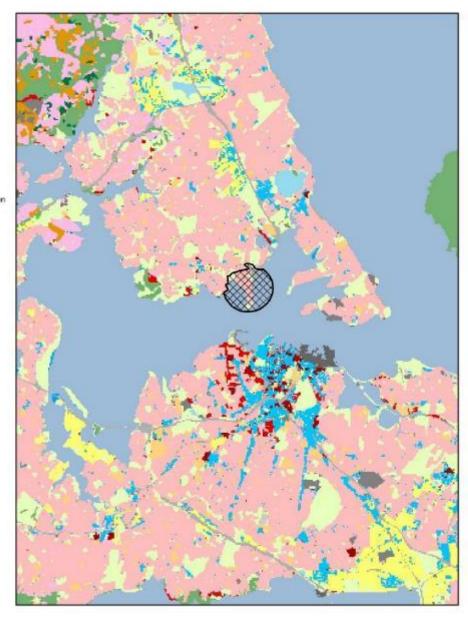






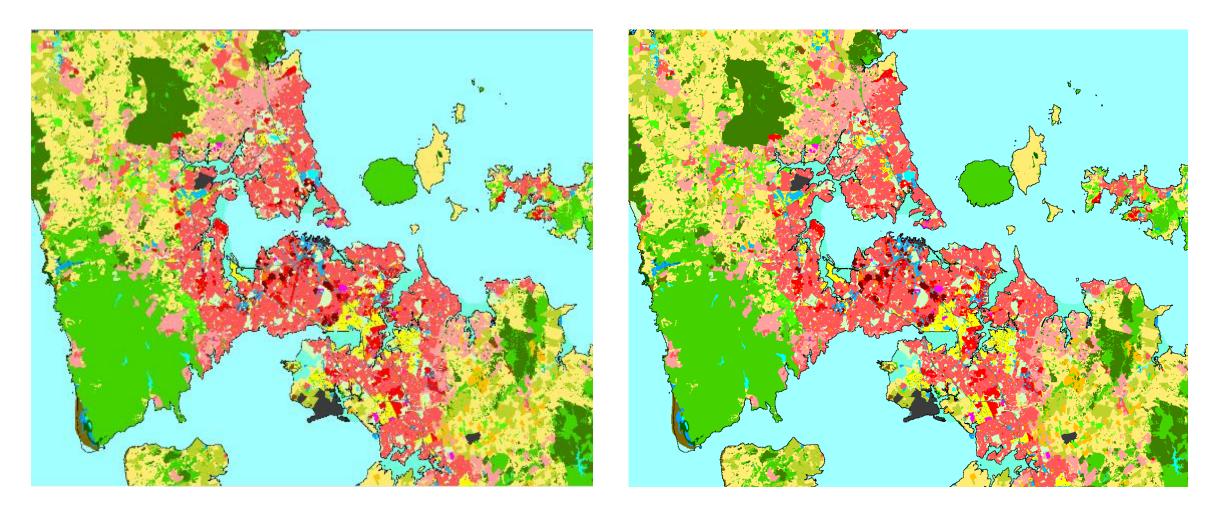
Scenario F PDC

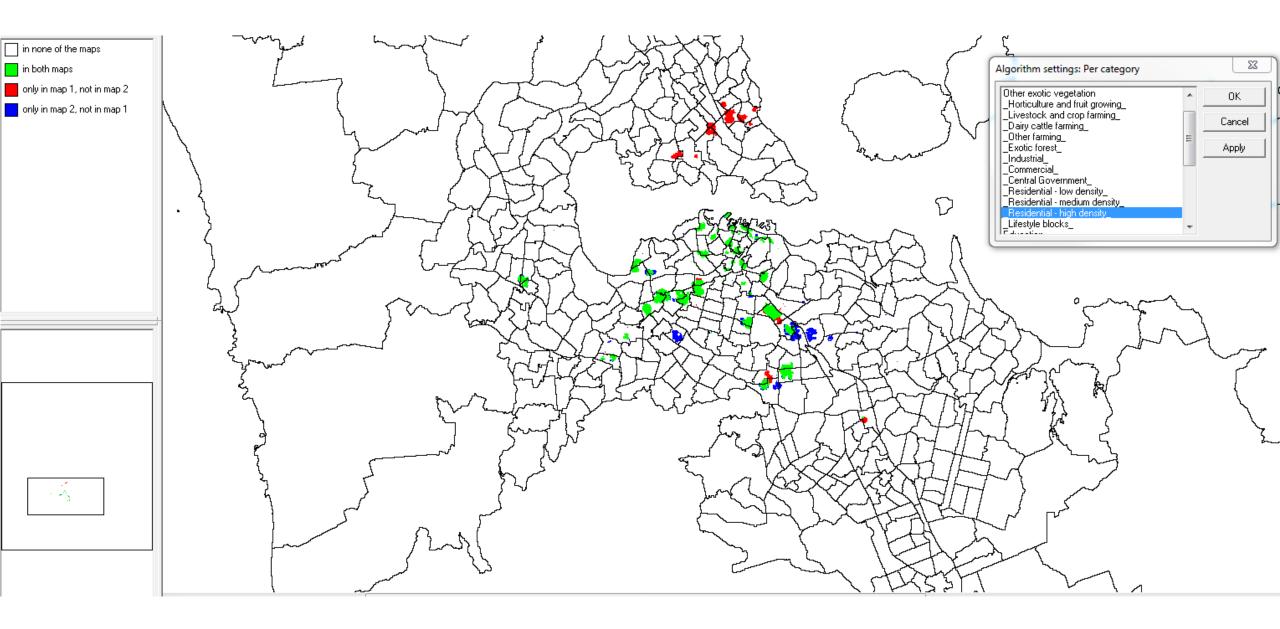




2041 With Bridge

2041 Without Bridge





Next Steps and Potential Future Research

- High density development versus urban sprawl
- Post hazard urban development
- Post hazard economic impacts and development (using MERIT)
- Assessment and comparison of various pre- and post- hazard management options
- Potential for incorporating cascading infrastructure failures and longterm outage impacts on land use



Figure 12.9 Water supply level of service map for period 1 May-30 April of Year 2. Water balance zones are colour coded according to service level, with blue for potable water, yellow for water restrictions, green for nonpotable water and water restrictions, and red for no water.