

WISE - An Integrated Spatial DSS

Wellington

A satellite image of New Zealand is shown. A dashed white circle is drawn around the city of Wellington on the North Island. A white arrow points from the text 'Wellington' to this circle.

**Beat Huser
Environment Waikato
New Zealand**

National Environmental Information Forum, Wellington 11 May 2010

What we will cover

➤ Creating Futures project

- What is **WISE** (Waikato Integrated Scenario Explorer)
- Case study – applying WISE for evidence-informed policy



Waikato Region

Other regions

New Zealand

Creating
Futures

Creating Futures FRST Project

(2006 – 2010)

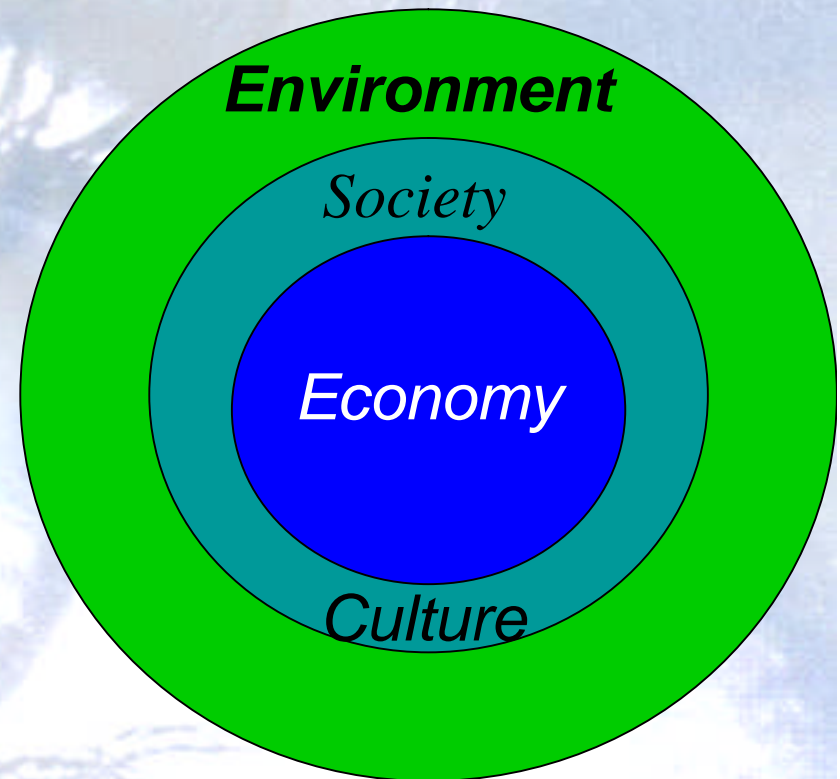
Aim

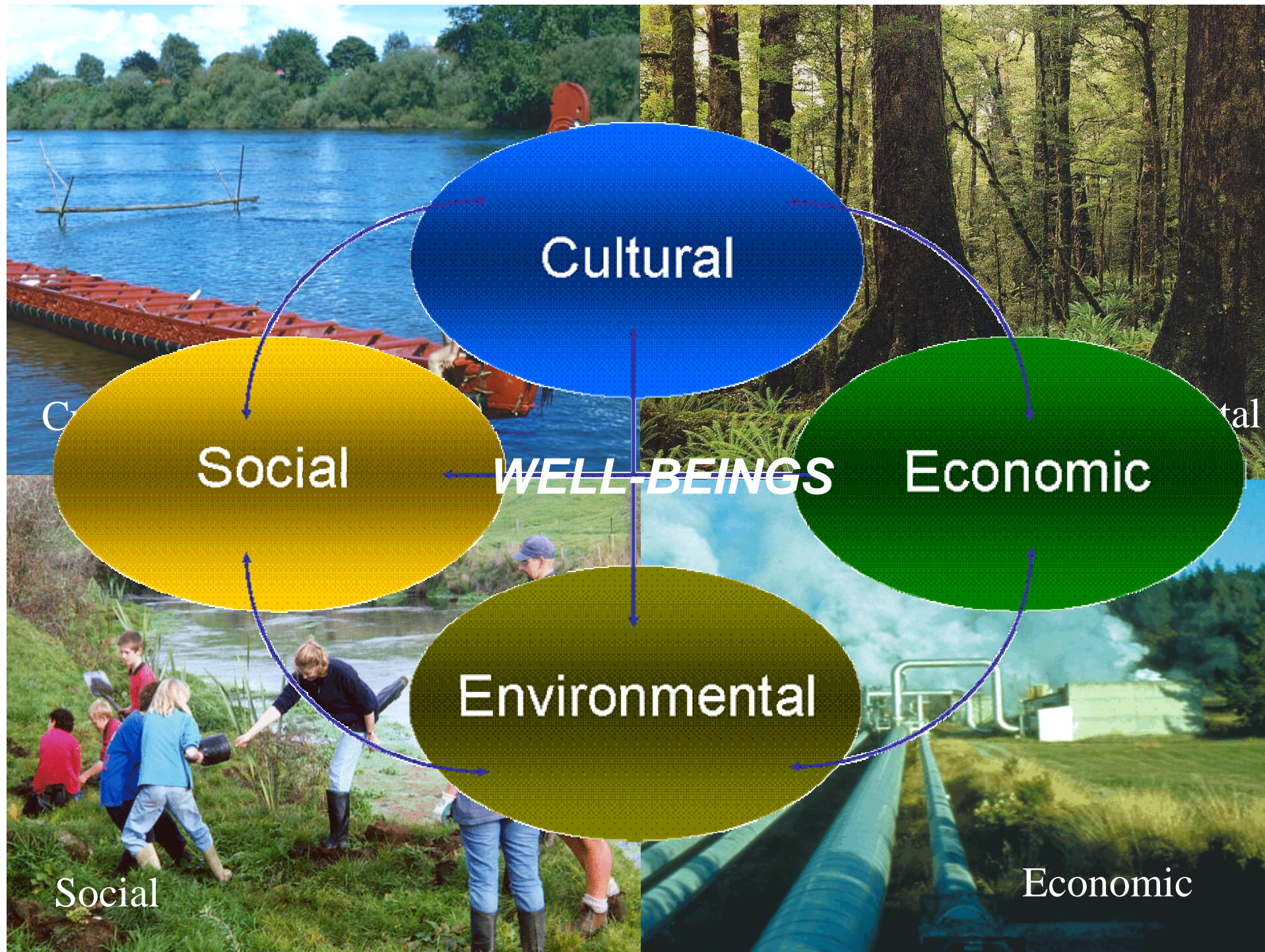
Develop and apply
planning and communication tools
to make informed choices for the future

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Why “New” Planning Tools?

1. **LONG TERM** planning and enhanced strategic focus
2. **LINKING** Science to Policy
 - evidence-based
 - informed decision-making
3. **INTEGRATION**
 - Strategic partnerships (multi-disciplinary)
 - Linking the four well-beings





A landscape photograph showing a vibrant green field in the foreground. In the middle ground, there are some tall, dry grasses and a small cluster of trees. The background features rolling green hills under a dramatic, dark blue sky. A bright, multi-colored rainbow arches across the sky, partially obscured by a large, white, fluffy cloud. The overall mood is one of hope and resilience.

“The future is not some place we are
going to, it is a place we are creating.”

(Peter Ellyard)



Land cover data supplied by Terralink NZ Limited (from 1996 Waikato Land Cover Database);
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Land Use - now

- 56% pastoral farming
- 12% plantation forestry
- 28% indigenous vegetation and wetlands
- < 1% horticulture
- < 1% urban uses

Waikato in 2050?

Project Structure

Project Leader

Dr Beat Huser



Advisory Group

Central and local government

OBJECTIVE 1:

Improved communication
& deliberation tools



NZ\$1.5M



OBJECTIVE 2:

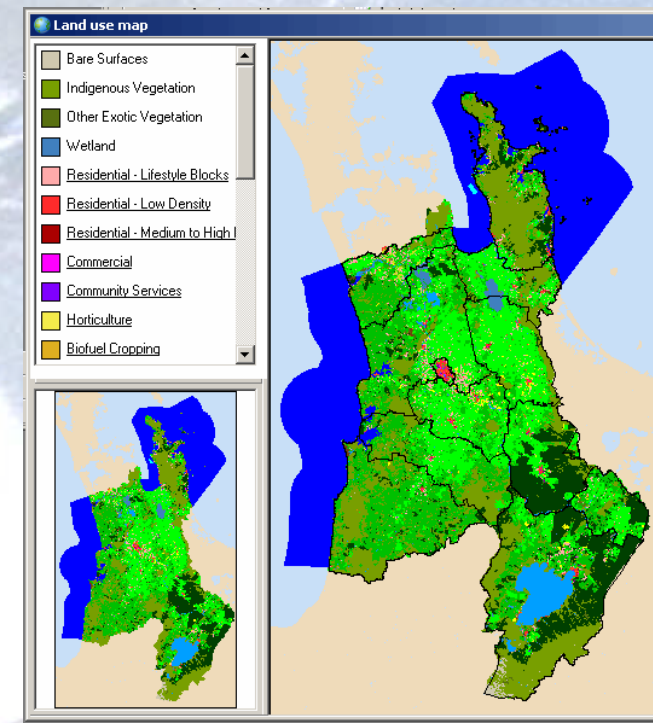
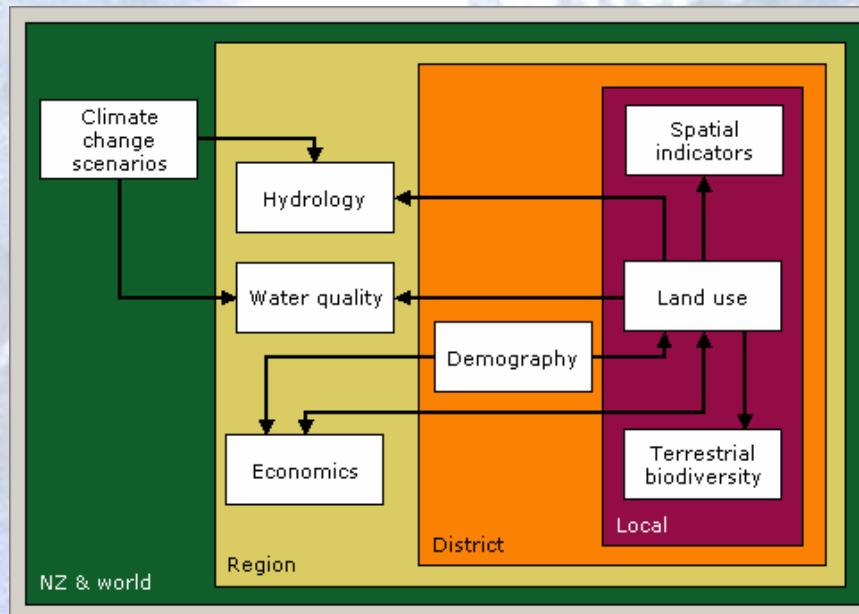
Spatial DSS development -
WISE



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What is **WISE**?

- Stand-alone software application
- System of interacting models

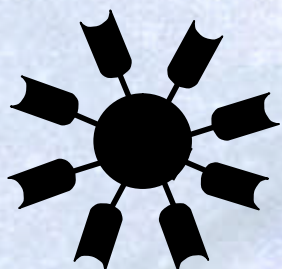


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Dynamic and Spatial Modelling

Source: RIKS 2006

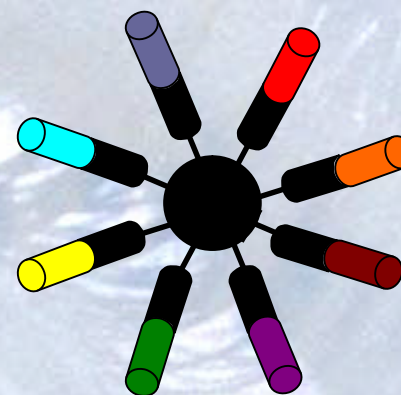
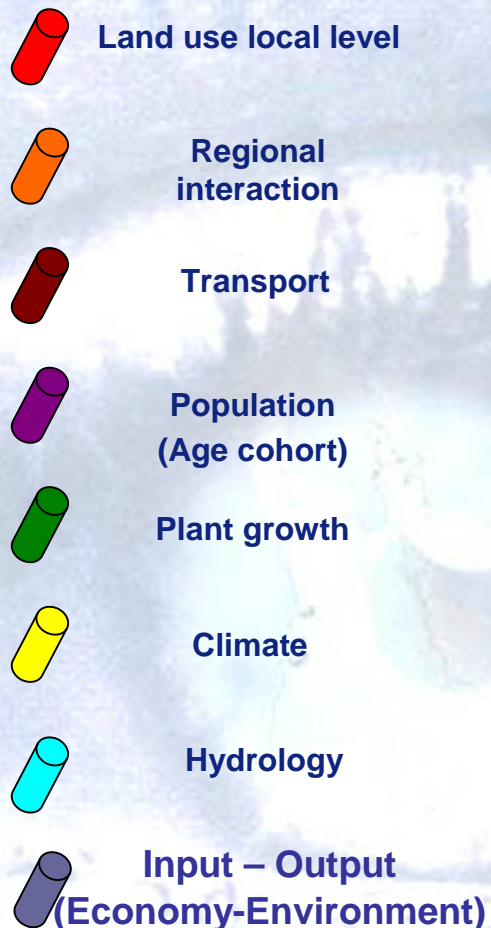
Basic Framework



Geonamica



Model library:

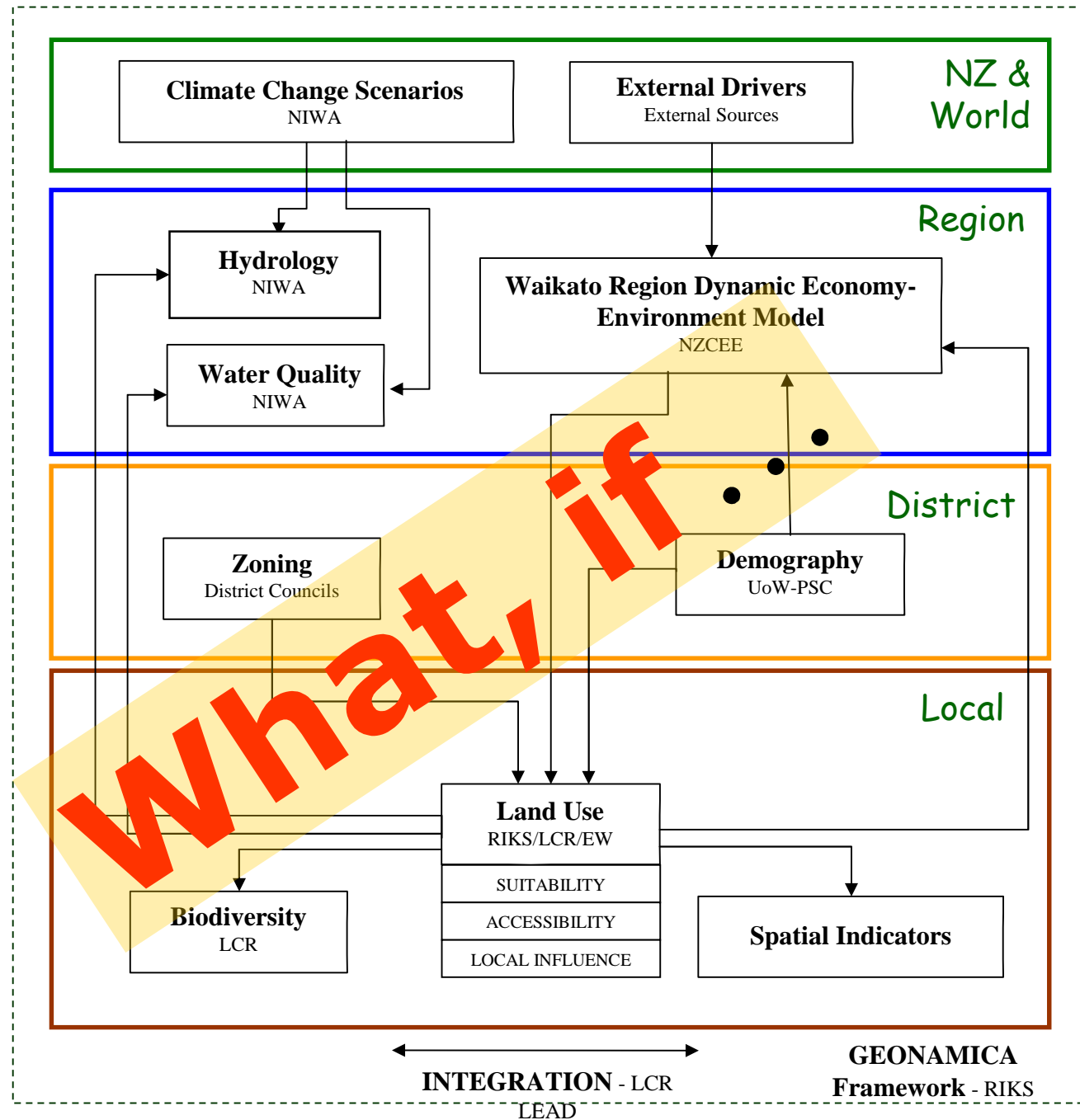


Product

WISE

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WISE Beta System Design



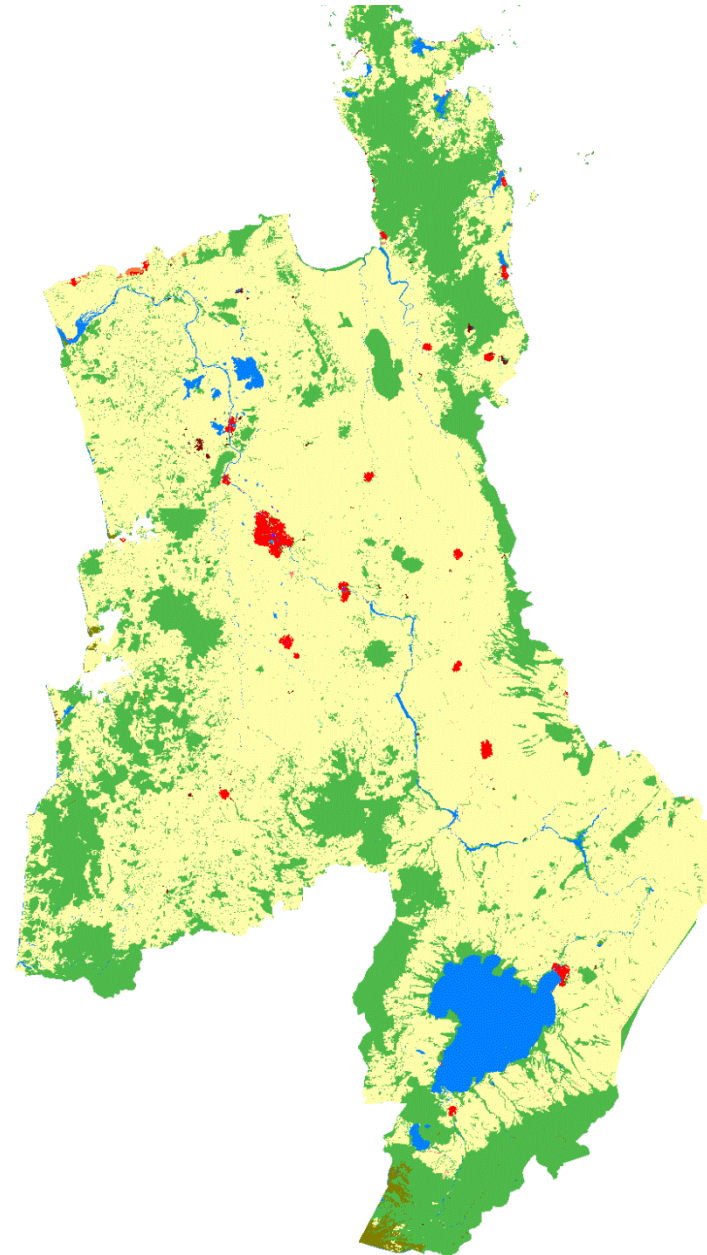
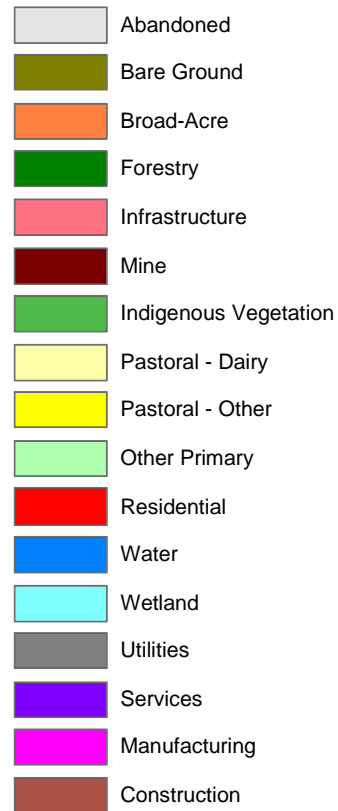
Mock Scenario for Waikato's Future 2000 – 2050

Note: based on WISE prototype

Dairy Expansion

Land for dairying
increases ~4% annually

Land Use



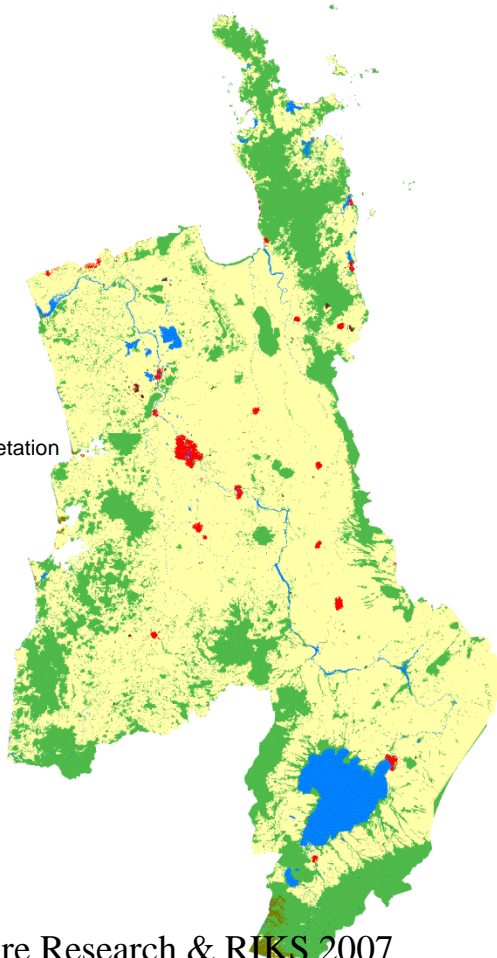
Source: Landcare Research & RIKS 2007

3 Mock Scenarios for Waikato's Future (2001-2050)

Note: based on WISE Prototype

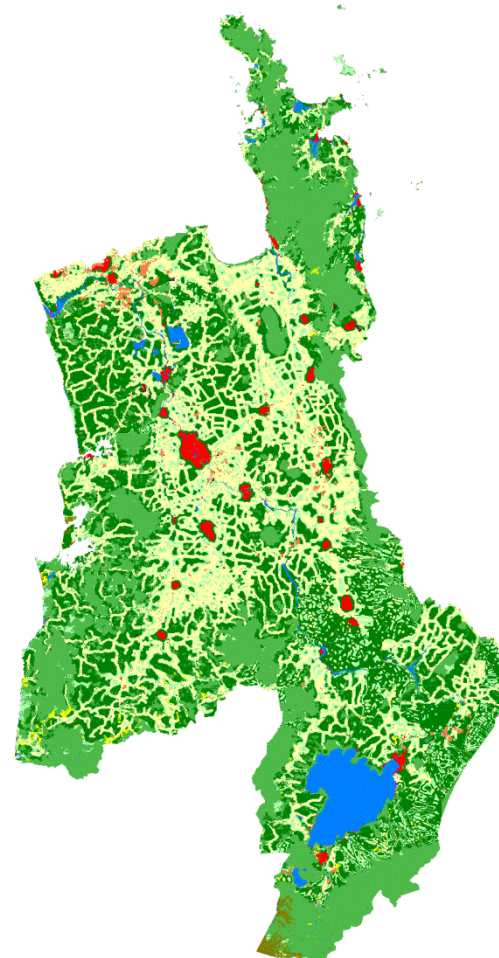
Dairy Expansion

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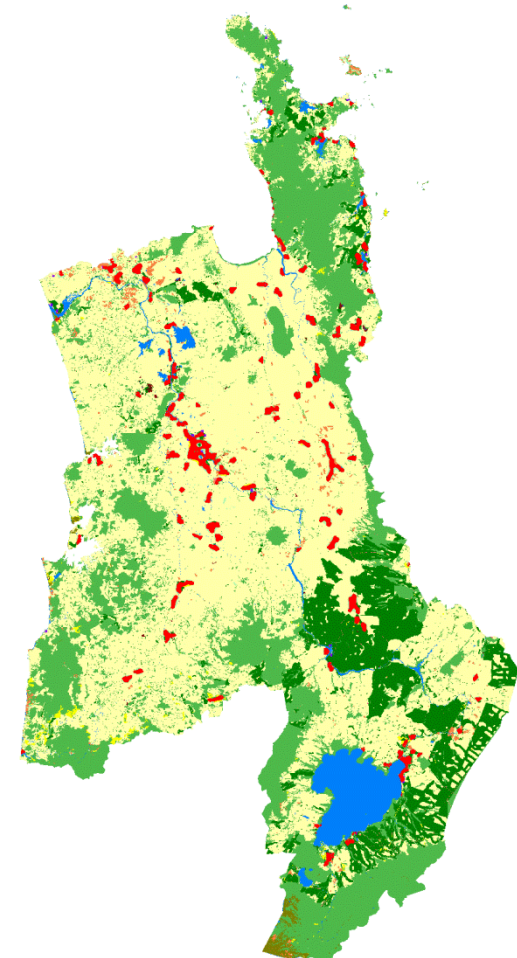
Diversification

Demand for non-dairy primary
production land increases

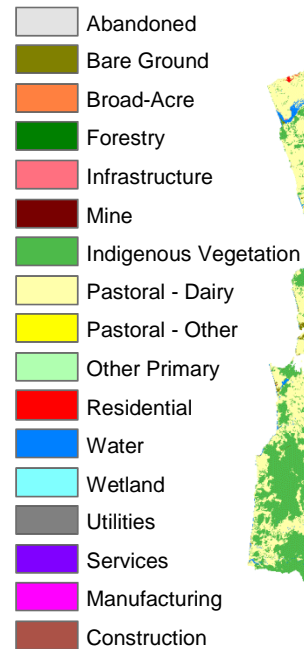


Village Life

Residential land
increases 7-fold



Land Use



Source: Landcare Research & RIKS 2007

How Environment Waikato may use WISE

- Explore alternative policy options for regional planning, assess trade-offs and prioritise issues
- Cumulative effects of policy and consents (over space/time)
- Up-to-date data and information
- Access to expert knowledge from all disciplines
- Economic development and sub-regional strategies (non-statutory) - FutureProof project (*refer following case study*)

A case study using **WISE**

- **FutureProof** (urban growth study for Hamilton and surrounding districts)
- Three “clues” for **“what/if”** input to WISE (*from FutureProof documents*):
 1. More compact urban areas
 2. Sensitive natural environments protected
 3. **Productive rural land protected (high quality soils)**

***Policy:
No Urban
Development on
High Class Soils***

**Class 1
Soils**

Hamilton

**Class 1 & 2
Soils**

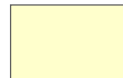
Hamilton

No Urbanisation on LUC Class 1

- Residential – Lifestyle Block
- Residential – Low Density
- Residential – Medium to High Density
- Commercial
- Community Service
- Manufacturing



Class 1



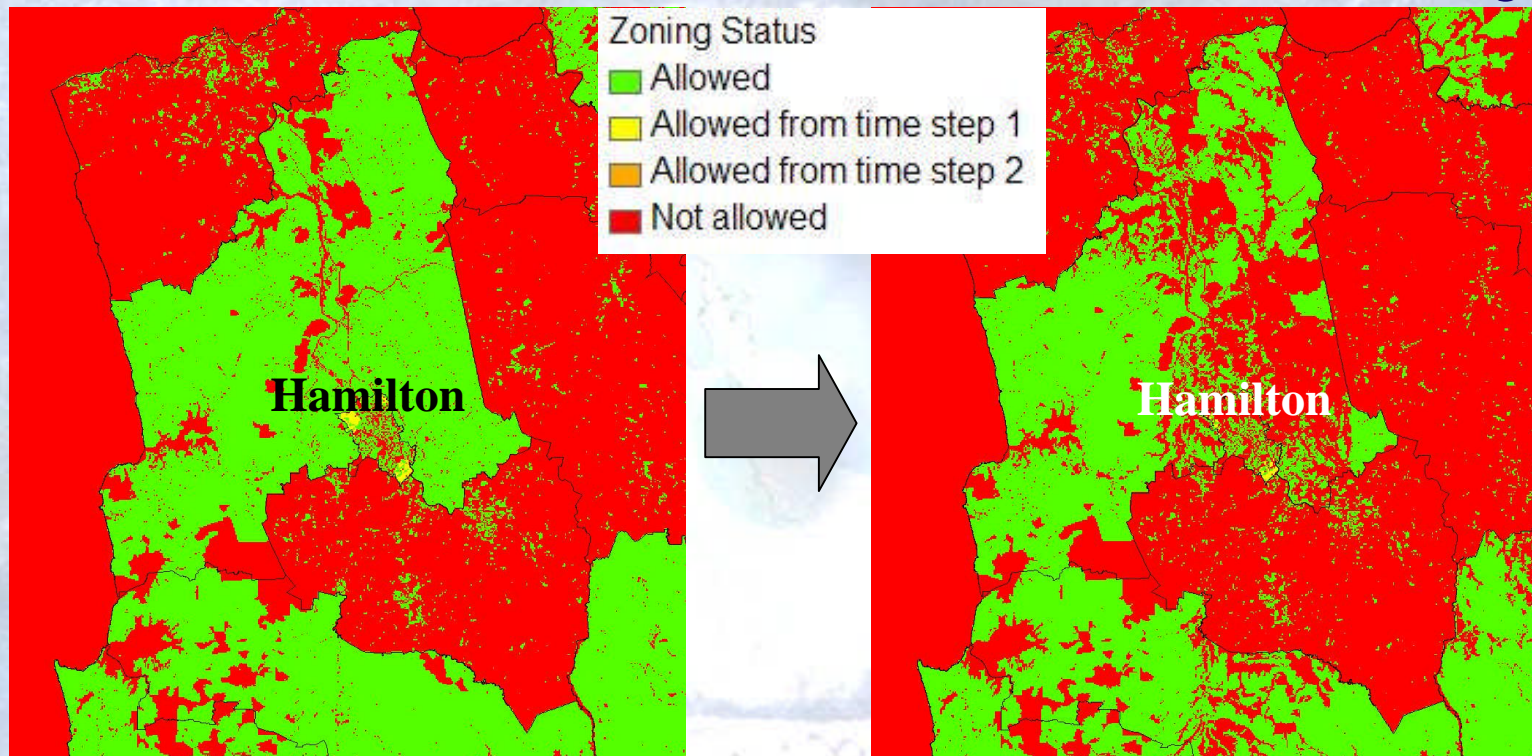
Class 2

High quality productive soils protected

Model input: residential land uses are zoned as “not allowed” in areas of high quality soils (LUC Class I & II)

Original Zoning

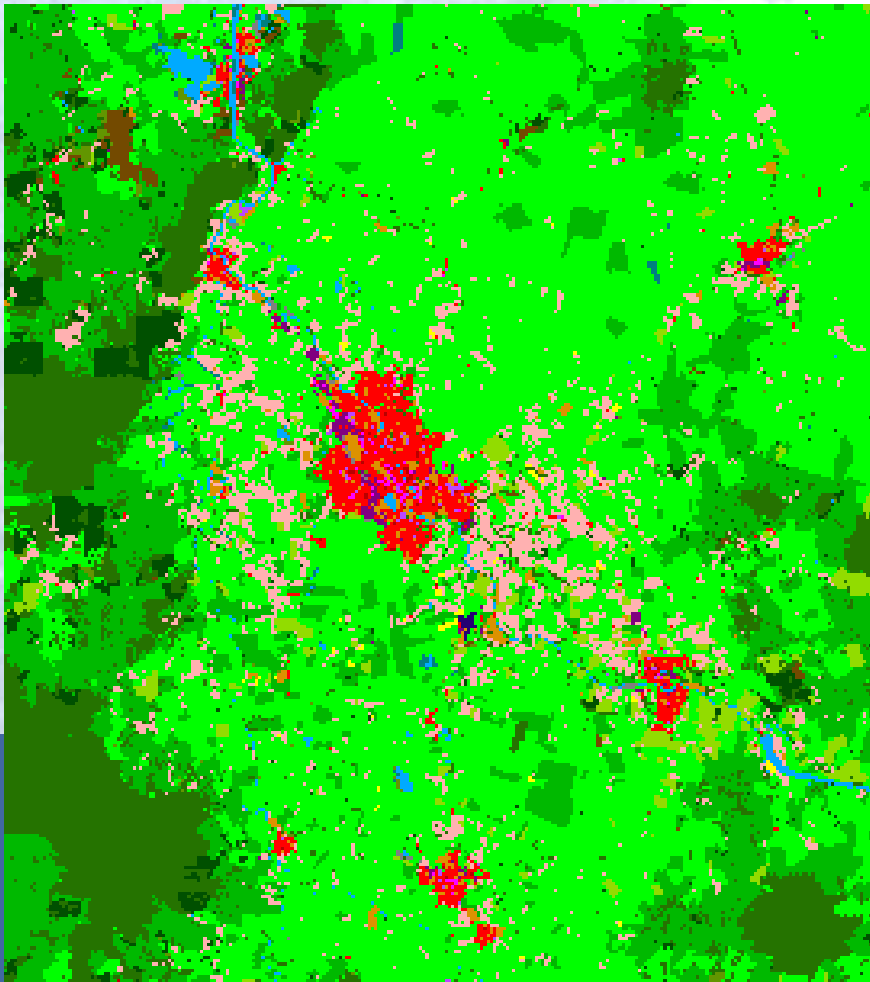
Soils Protected Zoning



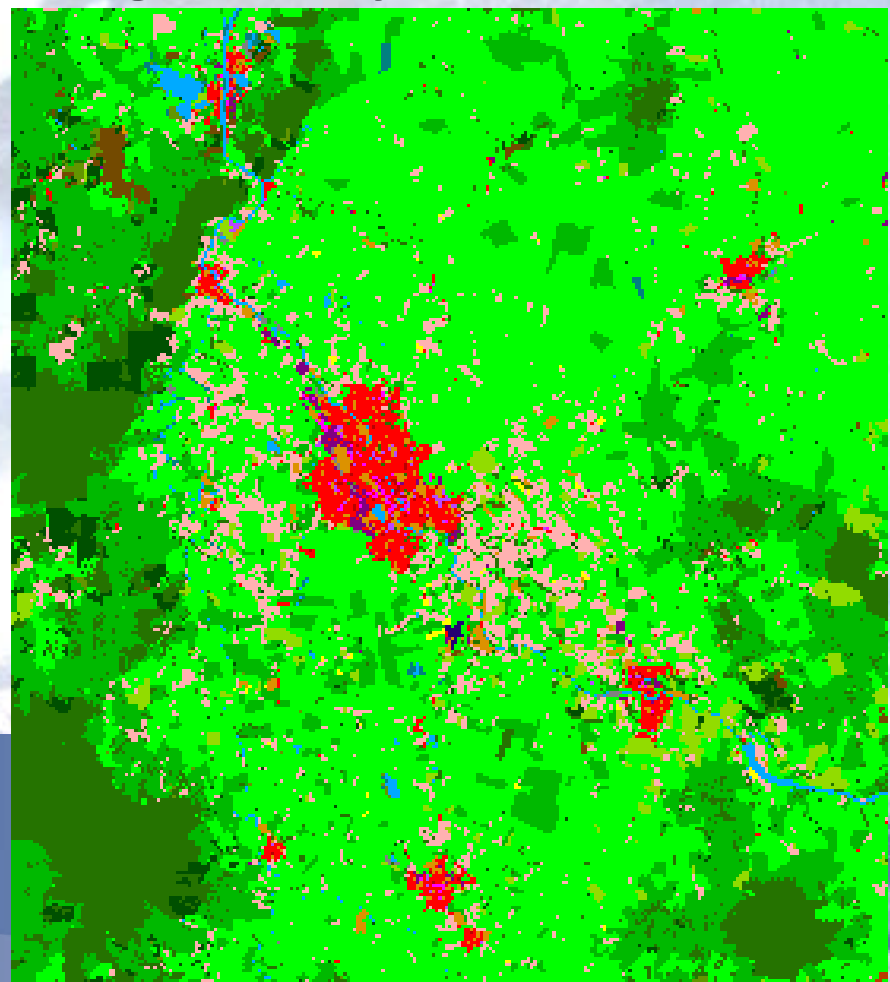
Policy: Protecting High Class Soils

Land Use Change – 2006 to 2050

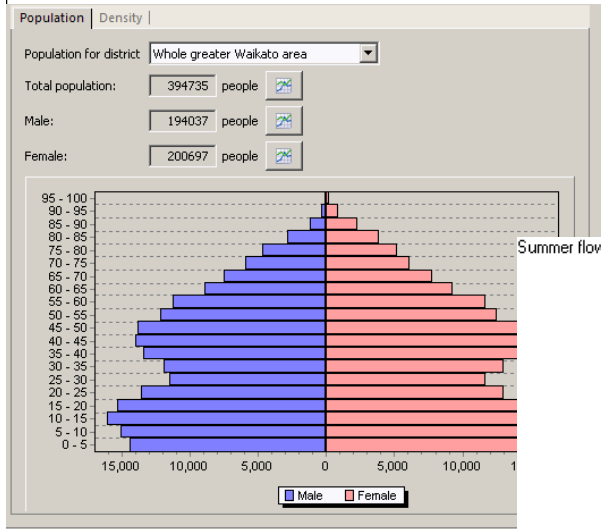
Business as Usual



High Quality Soils Protected

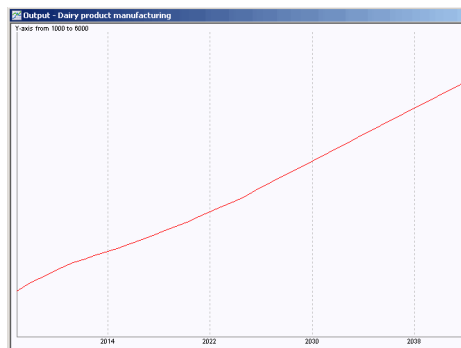


Examples of Outputs

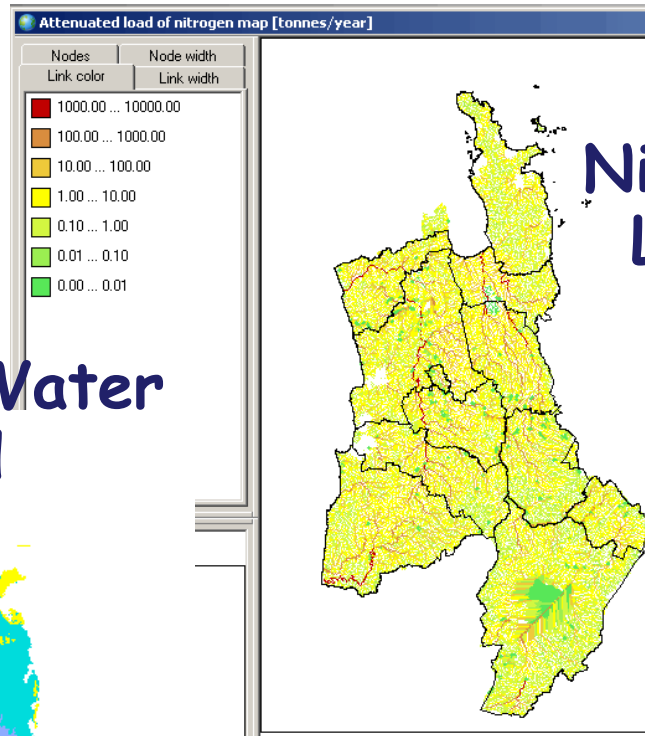
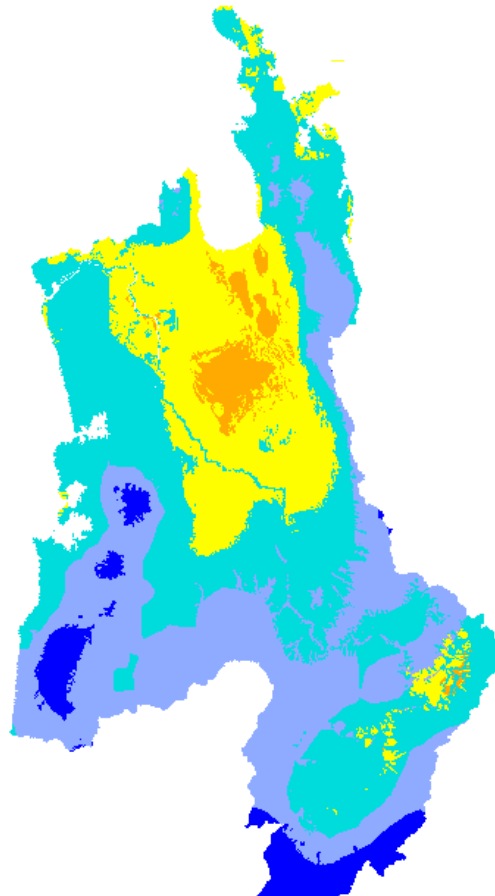


Population

Economics

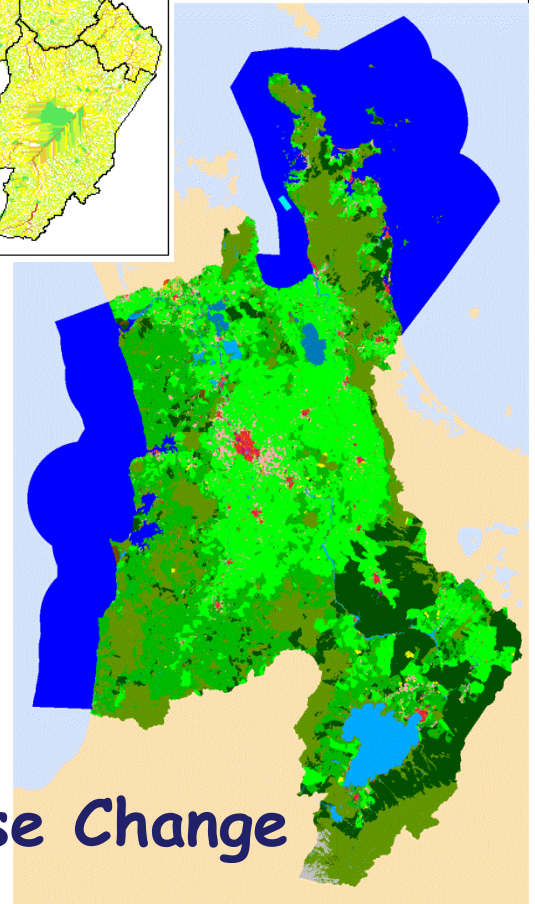


Summer Water Yield



Nitrogen Loads

Land Use Change



Conclusions

- WISE is a powerful tool to explore issues and spatially evaluate alternative policy options and associated trade-offs in an integrated way
- This presentation only skimmed the surface, there is much more to learn how WISE can be used for better planning outcomes
- Further development of regional integrated spatial DSS is underway (SP2 FRST project – Auckland, Wellington) and Envirolink workshop for regional councils in August)

Thanks

- ✓ **FRST** – Foundation of Research Science & Technology
- ✓ **Project Team members** (Daniel Rutledge, Liz Wedderburn *et al*)
- ✓ **Environment Waikato** and project partner organisations

www.creatingfutures.org.nz

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