

# Creating Futures Project

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

Creating  
Futures



# Creating Futures

- Govt funded - Foundation of Research, Science & Technology
- \$1.6Million - Four Year Project (2006 to 2010)
- Environment Waikato - Lead Agency
- Several Research Partners



# Creating Futures

Developing and applying  
planning tools to make  
informed choices for the future



*Programme Leader*    *Dr Beat Huser*  
*Science Leader*      *Dr Daniel Rutledge*

*Dr Liz Wedderburn*

**OBJECTIVE 1:**  
Improved communication  
& deliberation tools,

Scenarios



*Dr Daniel Rutledge*

**OBJECTIVE 2:**  
Spatial decision support  
system development



**Landcare Research**  
**Manaaki Whenua**



research institutes for knowledge systems



*Taihono Tukurangi*



Creating  
Futures

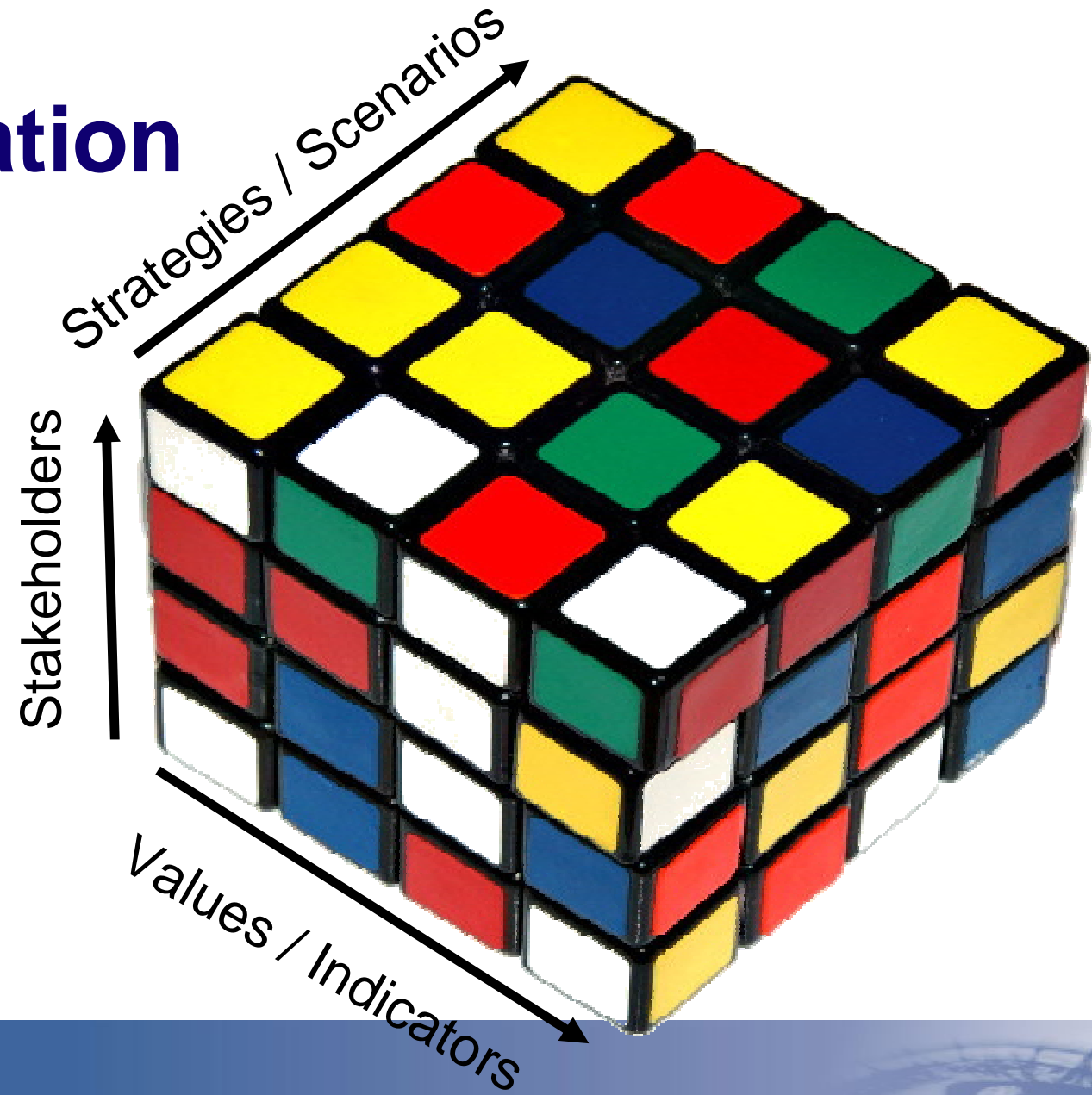
# Objective 1

**Processes to evaluate, deliberate, and choose futures through scenario analysis and multi-criteria evaluation frameworks**

- Create scenarios based on trends and activities
- Diagnose stakeholder interests and specify issues from scenarios
- Analyse underlying system and identify indicators
- Evaluate different scenarios based identified issues & indicators
- Deliberate on information identified through evaluation
- Revisit assumptions, indicators & issues as deliberation suggests



# Deliberation Matrix



Creating  
Futures

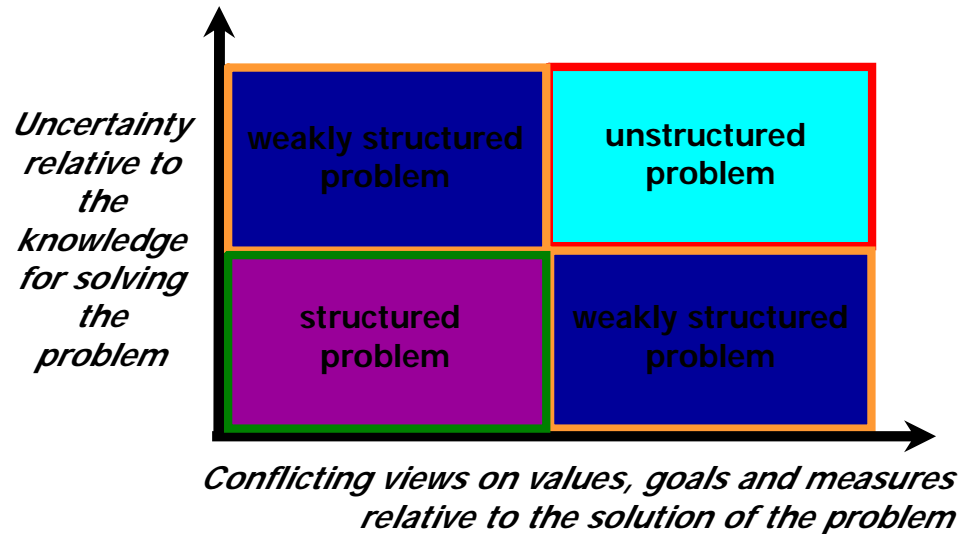


# Objective 2

## Development of Spatial Decision Support Systems to support long-term, integrated planning

### Why an SDSS?

- Long-term integrated planning and resource management are examples of “wicked” or unstructured problems
- Characterised by
  - ↓ Multiple actors
  - ↓ Multiple values & views
  - ↓ Multiple outcomes possible
  - ↓ High uncertainty



After van Delden 2000

### An SDSS helps address unstructured problems

- Integrates society, economy, and environment (systems approach)
- Identifies links & feedbacks
- Sets limits explicitly (e.g., only so much land, water, soil)
- Demonstrate importance of “where” in addition to “what” and “how much”

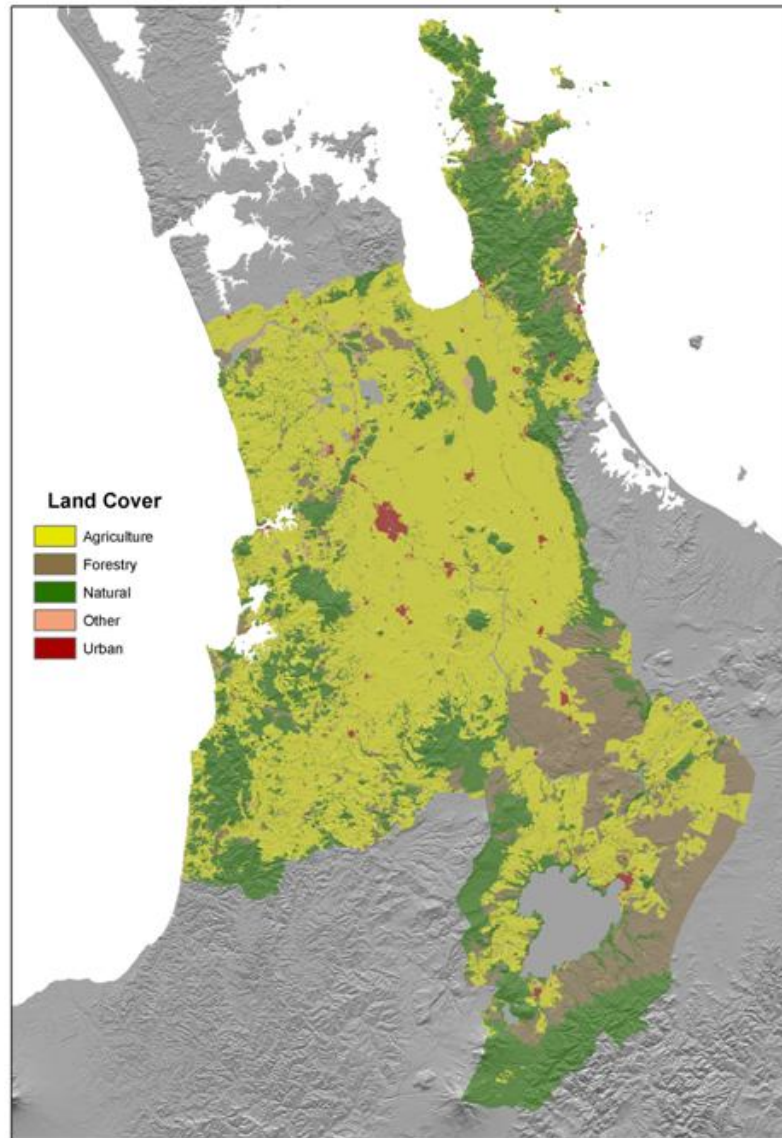


# Example of Unstructured Problem: Waikato Region Community Outcomes

- Sustainable Environment - The Waikato region values and protects its diverse, interconnected natural environments.
- Quality of Life - The Waikato region is a great place to live, providing the services and opportunities we need to live well.
- Sustainable Economy - The Waikato region balances a thriving economy with looking after its people, places and environment.
- Culture & Identify - The Waikato region identifies with - and values - its land, air rivers and waterways, mountains, flora, fauna and its people.
- Participation & Equity - The Waikato region builds strong informed communities and has a culture that encourages people and communities to play their part.



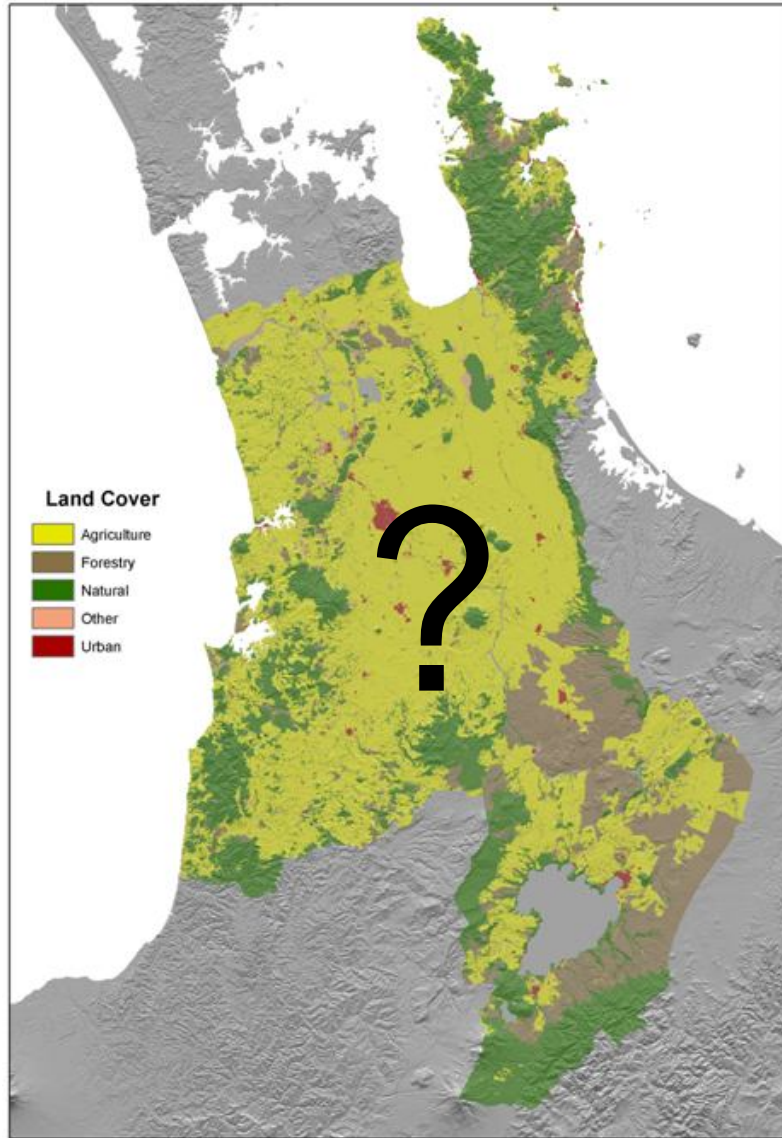
# Waikato 2006



- Population: 387,700  
(StatsNZ June 06 est.)
- Households: 145,100  
(StatsNZ June 06 est.)
- Land Cover (LCDB 2)
  - ↓ Agriculture 55.2%
  - ↓ Natural 28.2%
  - ↓ Forestry 14.4%
  - ↓ Urban 1.1%
  - ↓ Other 1.0%
- GDP: ~ \$12 Billion  
(2003 GDP + 3% annual growth)
- Ecological Footprint: ~9 ha
- # Businesses: ~34,000





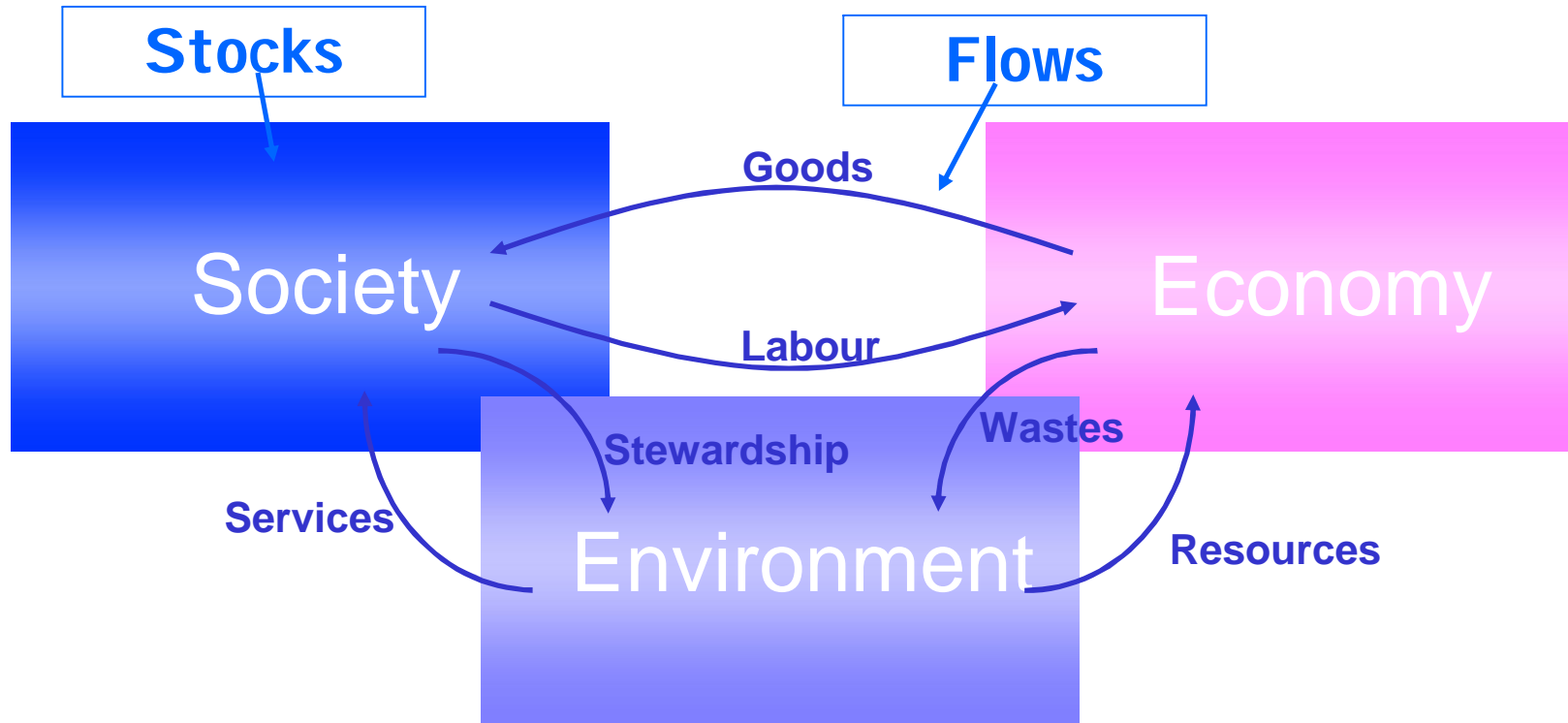


# Waikato 2026?

- Population: 426,800  
(+39,100, StatsNZ 2026 med. est.)
- Households: 169,400  
(+24,300; StatsNZ June 06 est.)
- Land Cover (LCDB 7)
  - ↓ Agriculture ?
  - ↓ Natural ?
  - ↓ Forestry ?
  - ↓ Urban ?
  - ↓ Other ~ ?
- GDP: ~ \$33 Billion  
(2003 GDP + 3% annual growth)
- Ecological Footprint: ?
- # Businesses: ~50,000+ ?

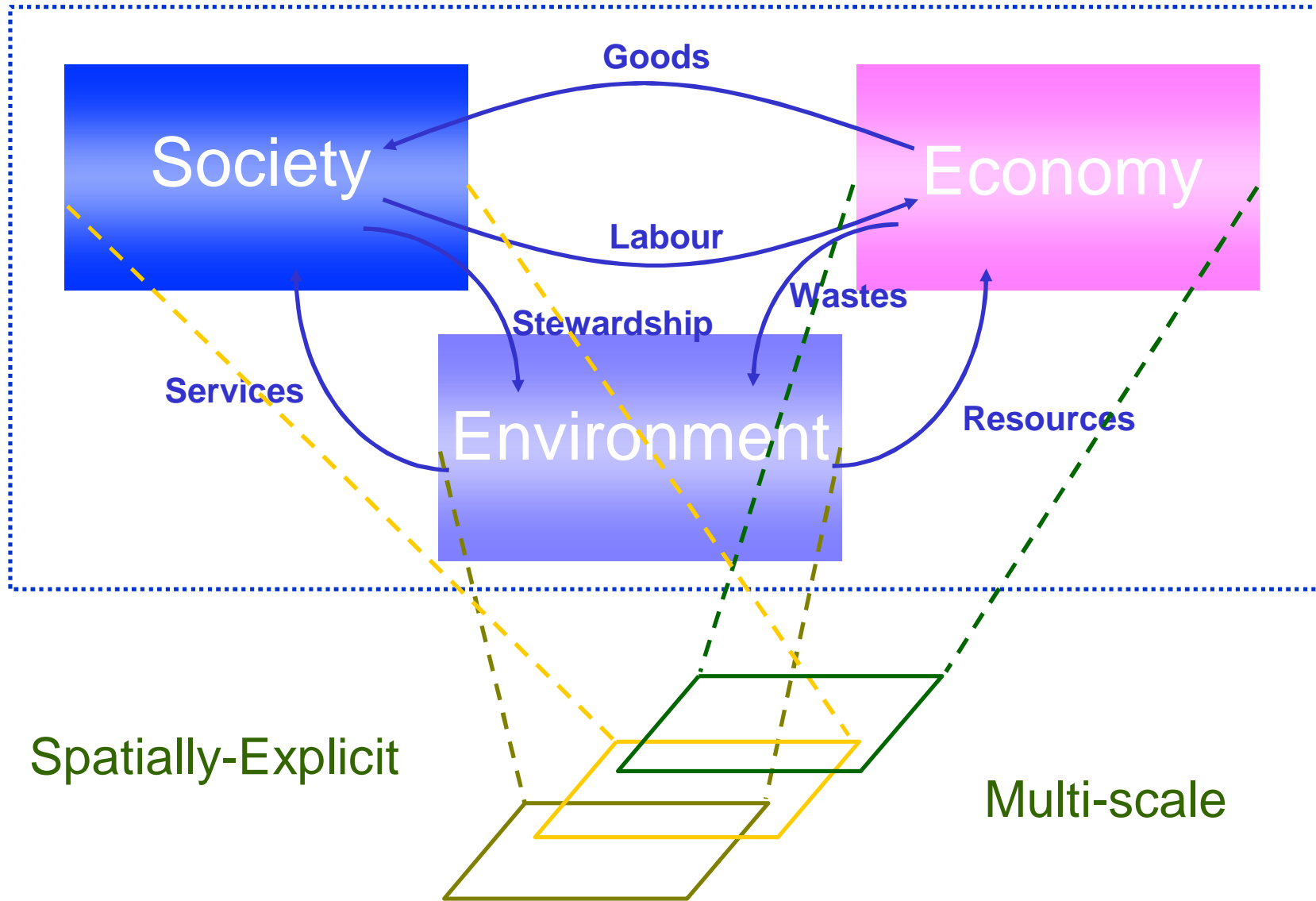


# SDSS: Systems Approach



Systems models track **stocks & flows** over time





Creating  
**Futures**



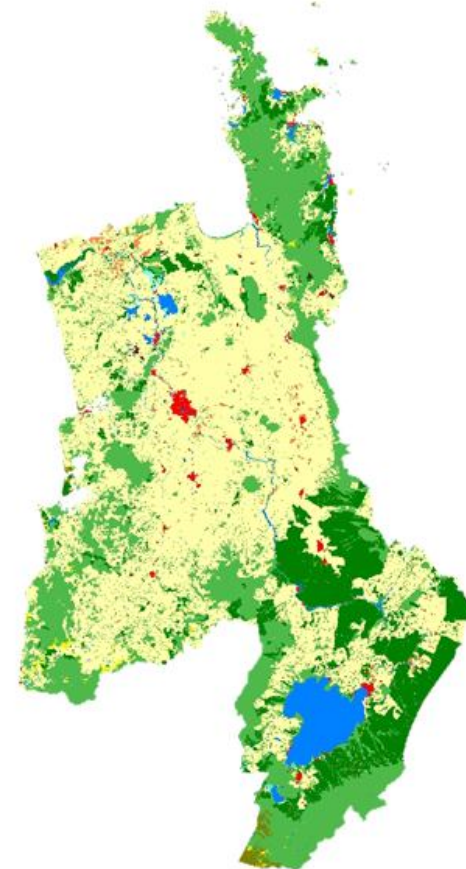
# SDSS Operates at 3 Scales



Region



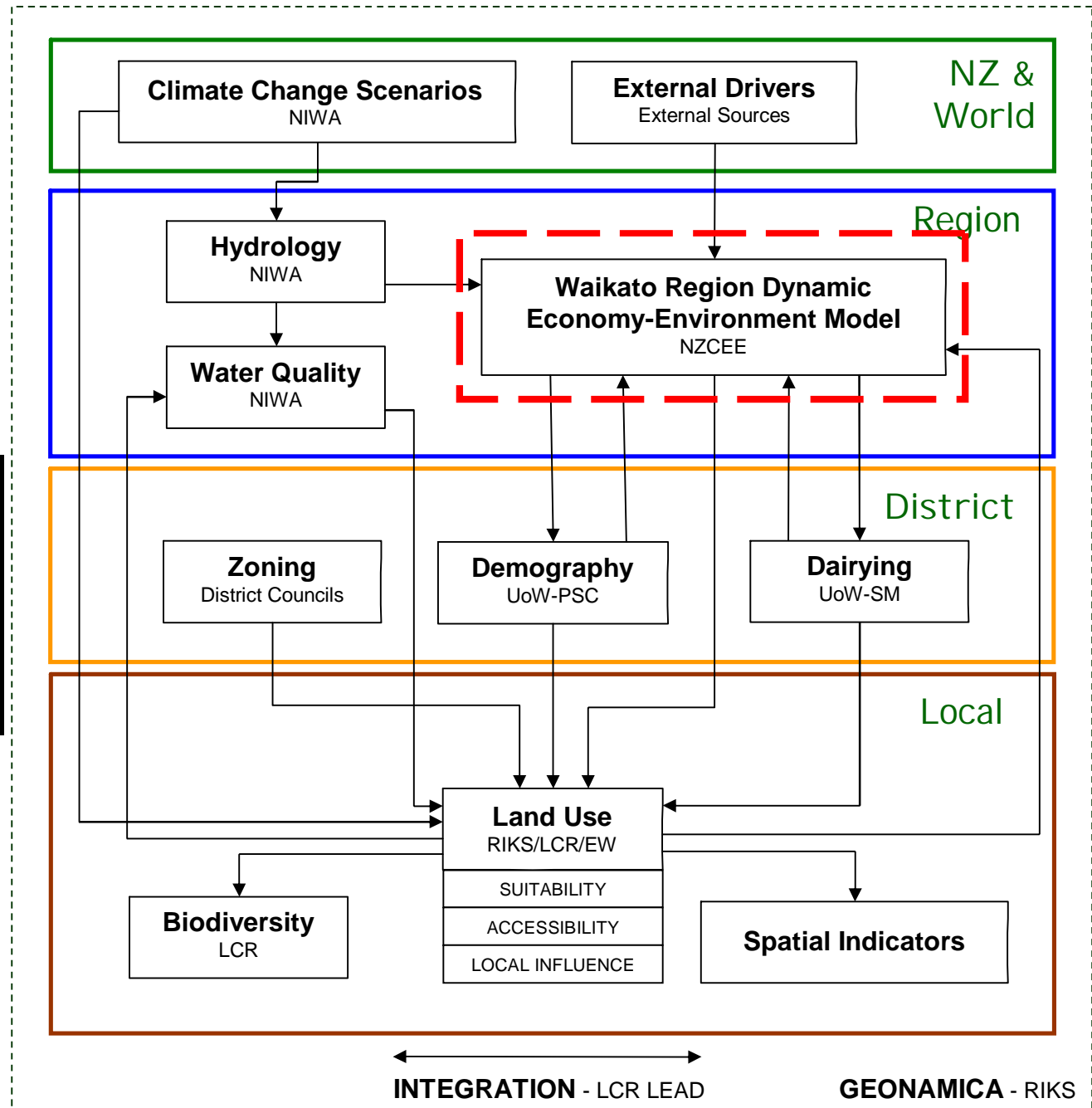
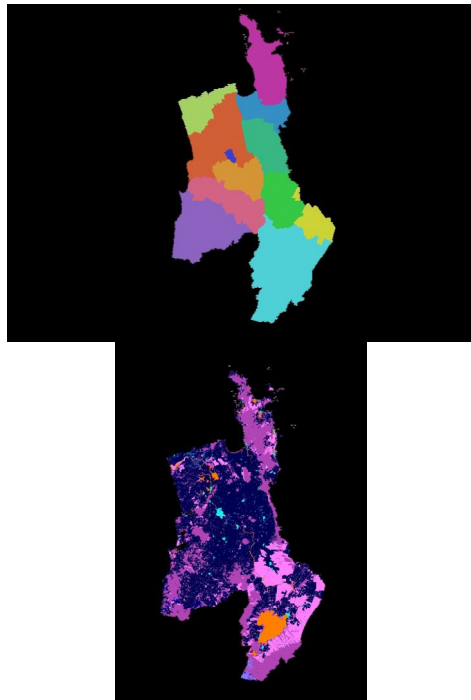
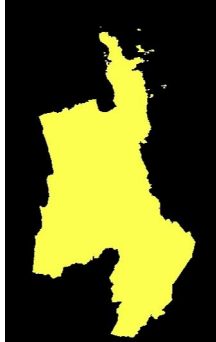
District



Local  
(200 x 200 m cells)

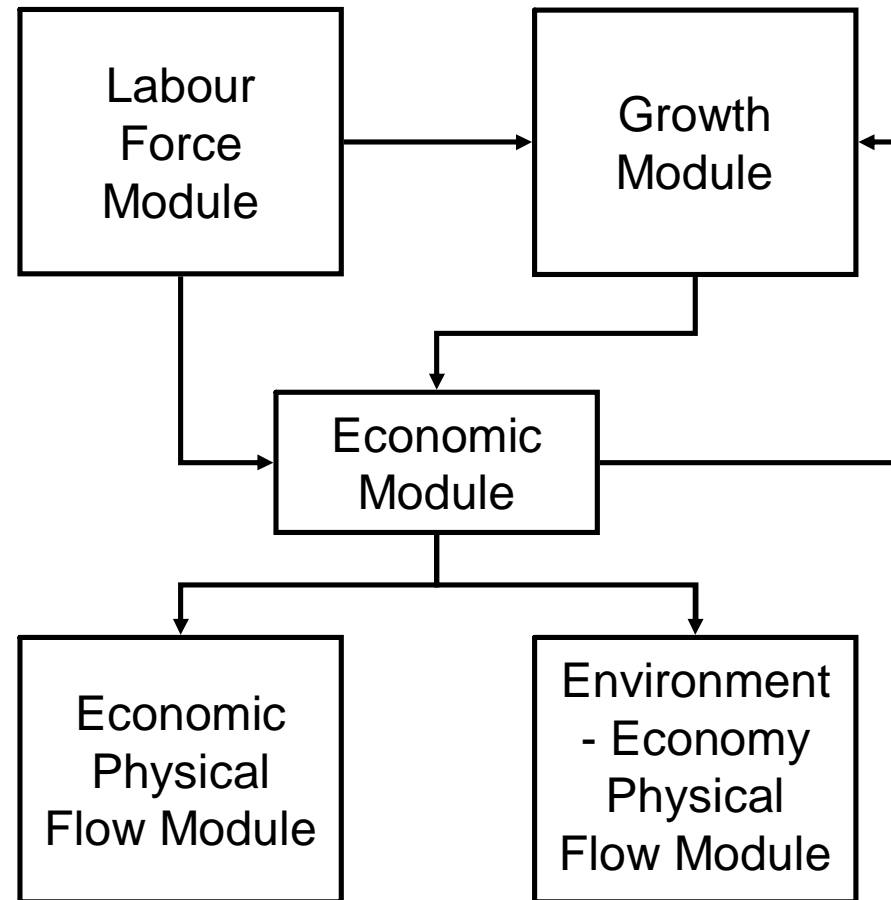


# Draft SDSS System Design



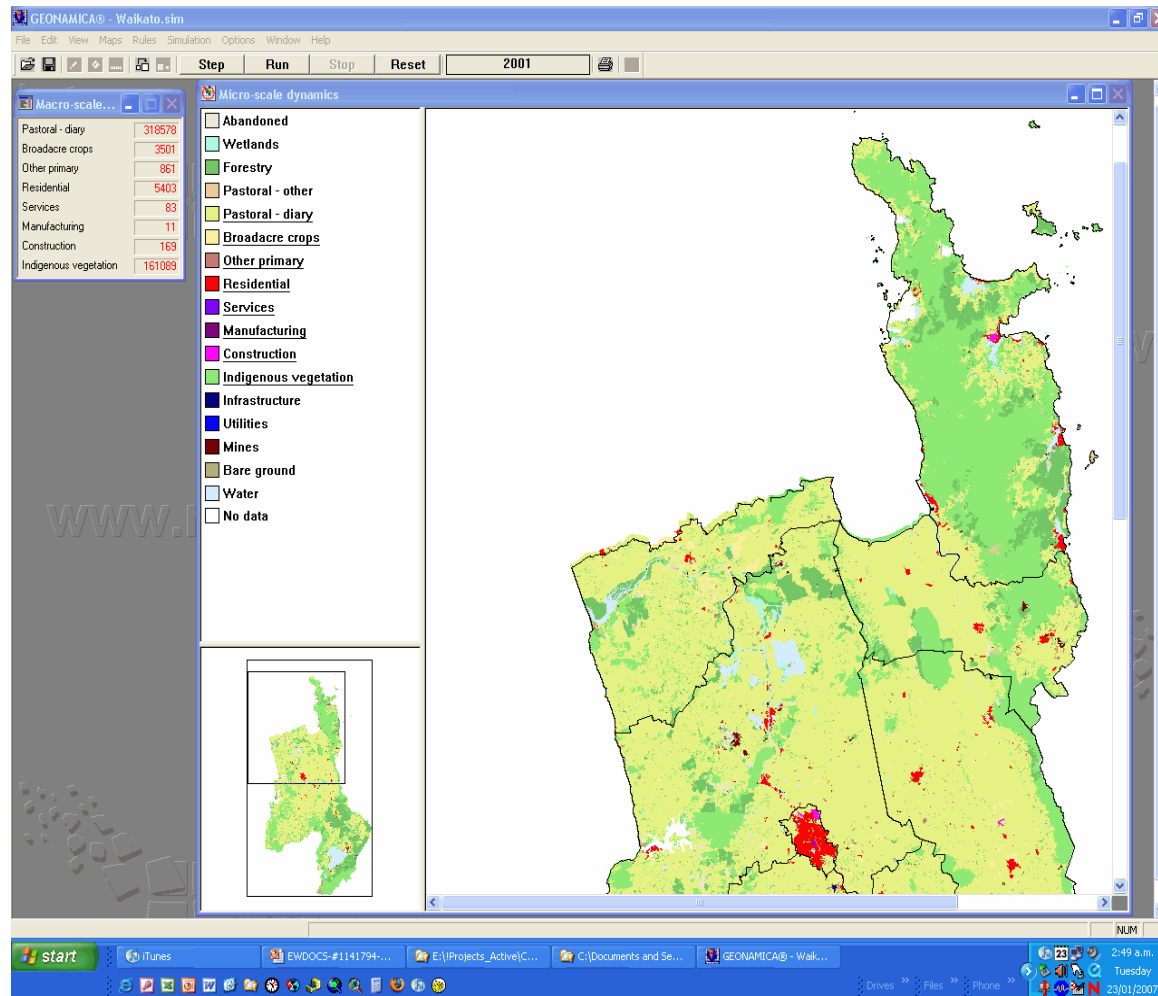
# WRDEEM: Waikato Region Dynamic Economy-Environment Model

- From ARDEEM - Auckland-based model developed under the Pathways to Sustainability FRST Programme
- Models flows of economic commodities
  - monetary (\$NZ1998)
  - physical (tonnes)
  - natural resource inputs (e.g. land, energy, water)
  - residual outputs (e.g. wastes, pollutants and emissions).
- Simulate combined environmental and economic implications of change between 1998 and 2051.[\[1\]](#)
- Driven by economic growth scenarios



# Waikato SDSS Prototype

- Development co-funded by Landcare Research
- RIKS METRONAMICA model populated with Waikato data
- Only models land use change
- Demand for land use set explicitly



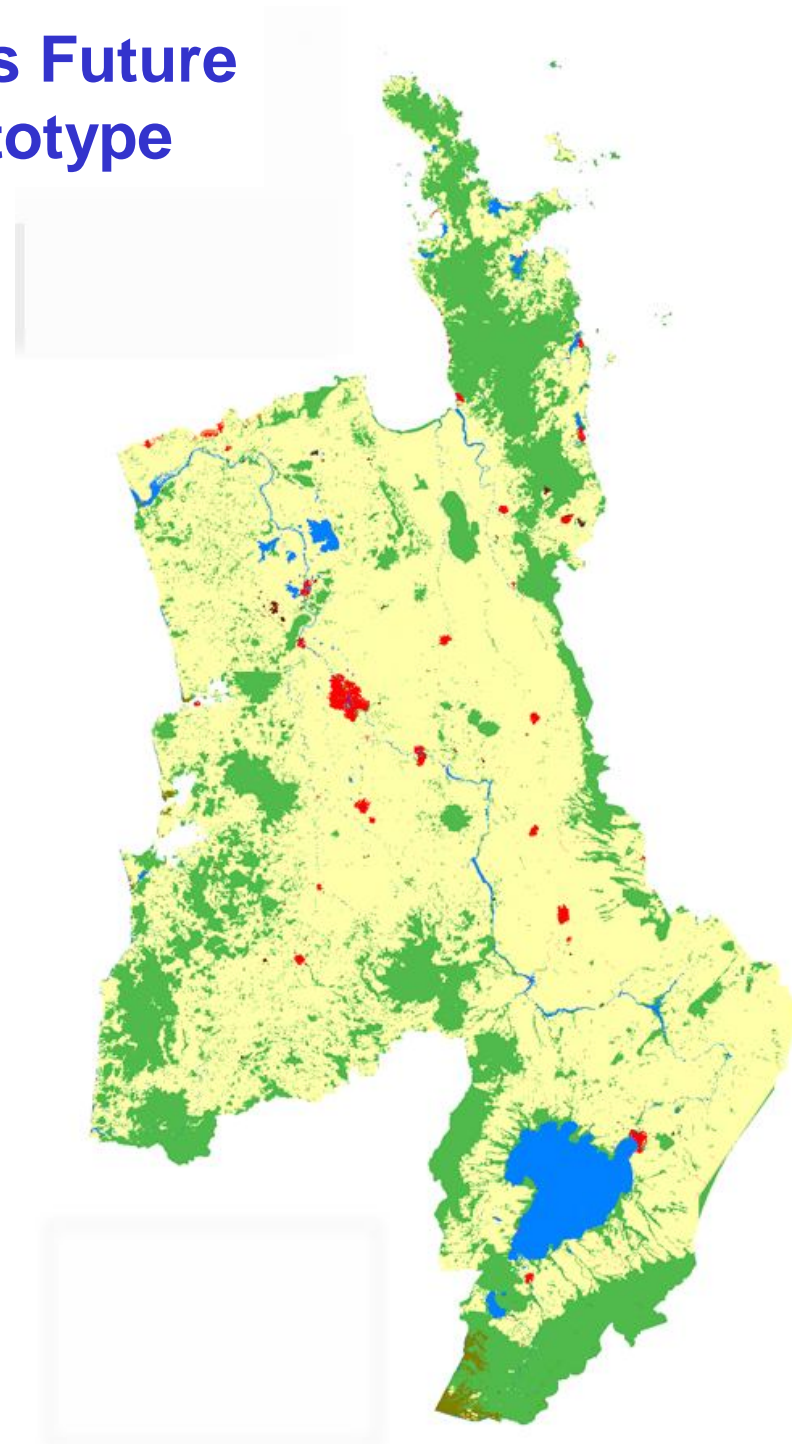
Creating  
Futures

# 3 Mock Scenarios for Waikato's Future 2001-2050 based on SDSS Prototype

## Dairy Expansion

Land for dairying  
increases ~4% annually

### Land Use



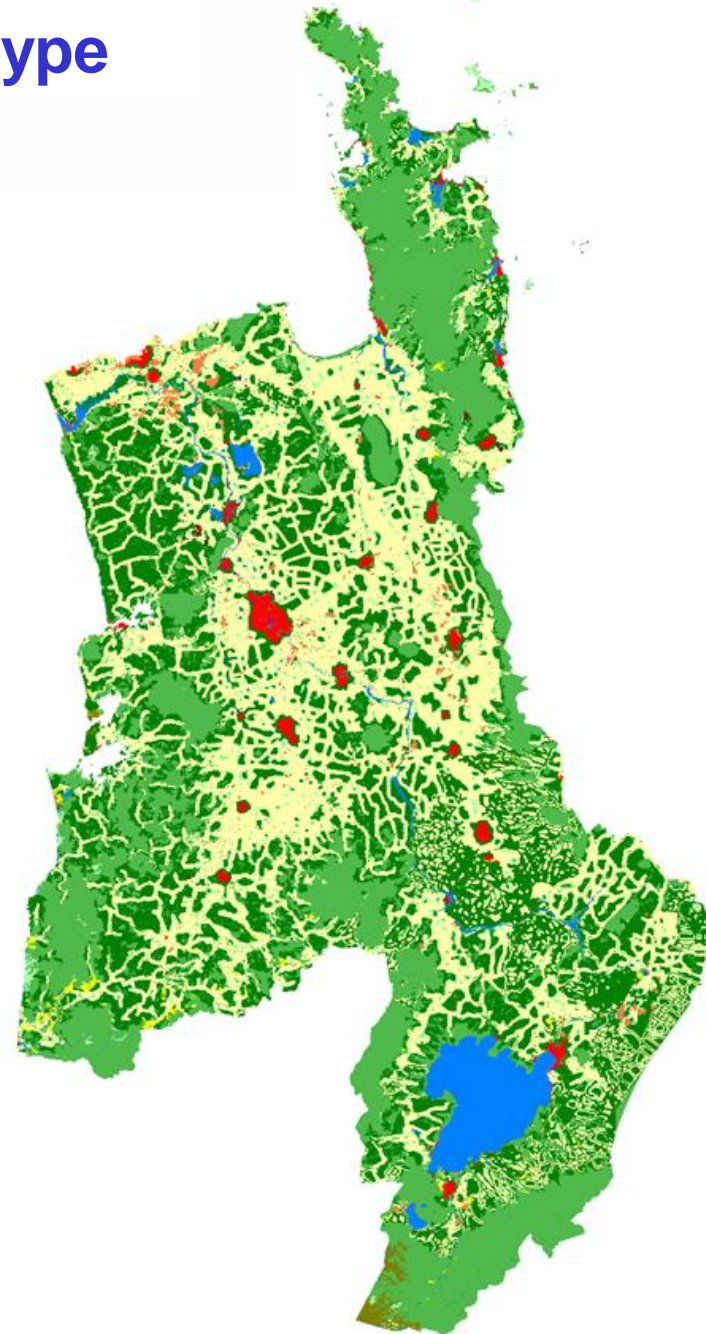


# 3 Mock Scenarios for Waikato's Future 2001-2050 based on SDSS Prototype

## Diversification

Demand for non-dairy primary  
production land increases

### Land Use

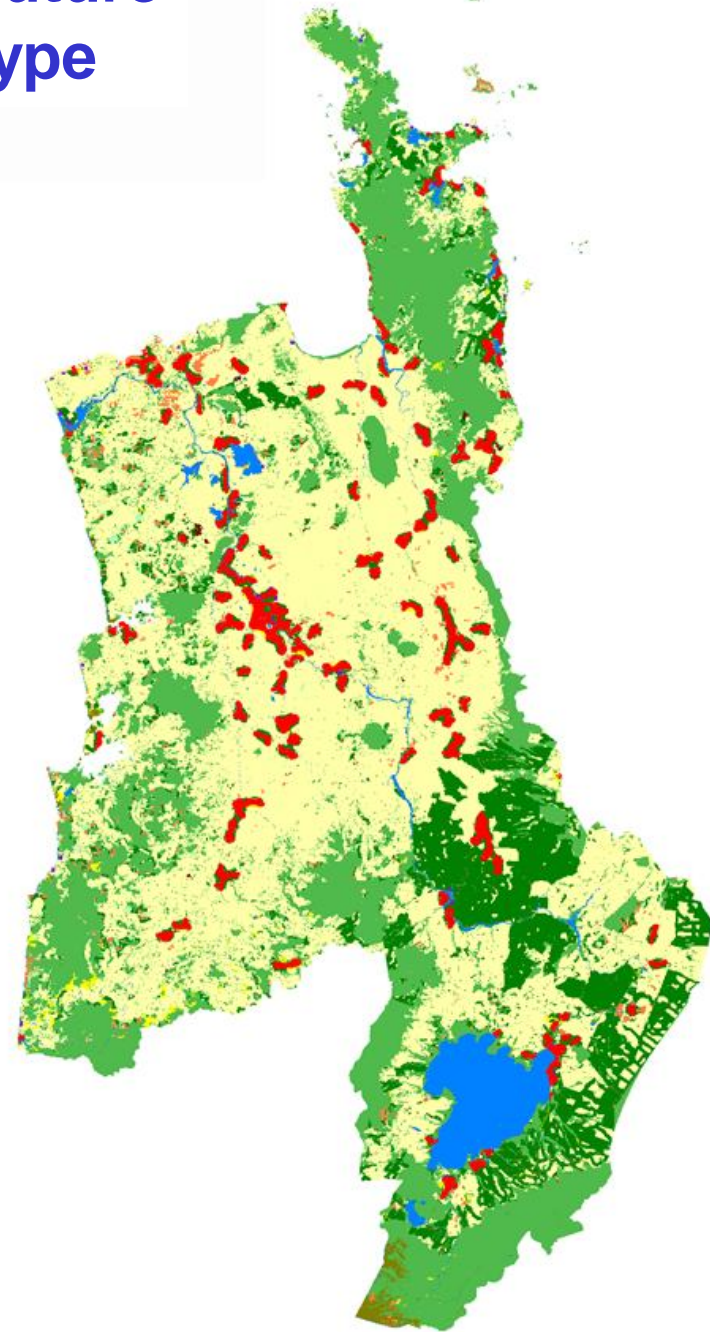


# 3 Mock Scenarios for Waikato's Future 2001-2050 based on SDSS Prototype

## Village Life

Residential land  
increases 7-fold

### Land Use



# 3 Mock Scenarios for Waikato's Future 2001-2050 based on SDSS Prototype

## Dairy Expansion

Land for dairying  
increases ~4% annually

## Diversification

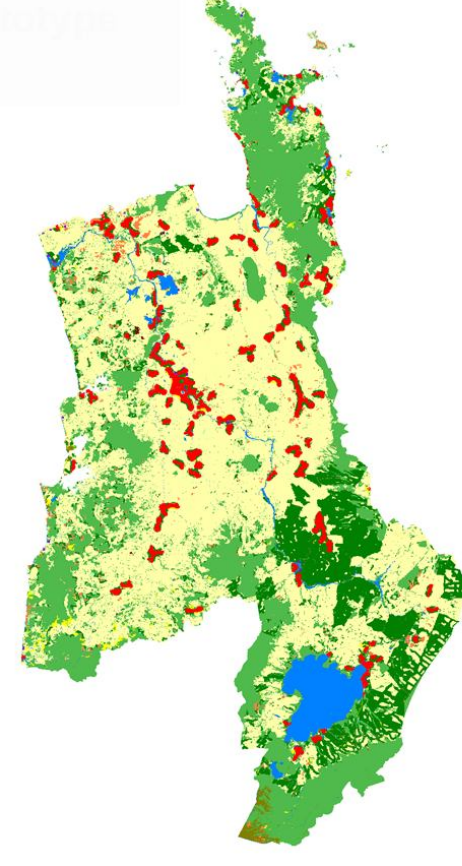
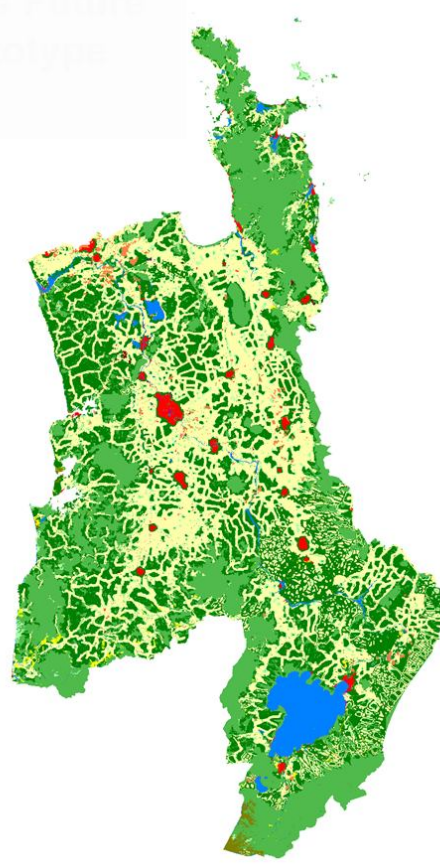
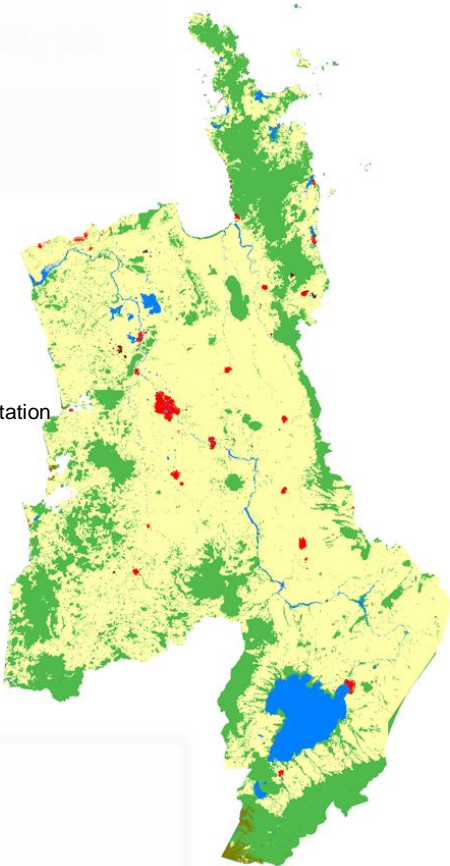
Demand for non-dairy primary  
production land increases

## Village Life

Residential land  
increases 7-fold

### Land Use

- Abandoned
- Bare Ground
- Broad-Acre
- Forestry
- Infrastructure
- Mine
- Indigenous Vegetation
- Pastoral - Dairy
- Pastoral - Other
- Other Primary
- Residential
- Water
- Wetland
- Utilities
- Services
- Manufacturing
- Construction



# What We Want to Achieve

1. Planning tools that inform communities
2. Tools expose links and trade-offs
3. Councils use these tools



# Contacts

- Dr Beat Huser, Environment Waikato
  - Project Leader
  - [Beat.Huser@ew.govt.nz](mailto:Beat.Huser@ew.govt.nz)
  
- Dr Daniel Rutledge, Landcare Research
  - Science Leader & Objective 2 Leader
  - [rutledged@landcareresearch.co.nz](mailto:rutledged@landcareresearch.co.nz)
  
- Dr Liz Wedderburn, AgResearch
  - Objective 1 Leader
  - [liz.wedderburn@agresearch.co.nz](mailto:liz.wedderburn@agresearch.co.nz)

