LUMASS

Land Use Management Support System

Alexander Herzig, Daniel Rutledge, Anne-Gaelle Ausseil, John Dymond

LANDCARE RESEARCH
MANAAKI WHENUA

Sustainable Landscape Management

How does the system work?

How does it react to management?

Spatially explicit system dynamics modelling

- System understanding
- Impact assessment

What do we do?

Where do we do it?

Optimal spatial resource/land-use allocation

- Land-use development scenarios
- Limits testing
- Resource-use efficiency

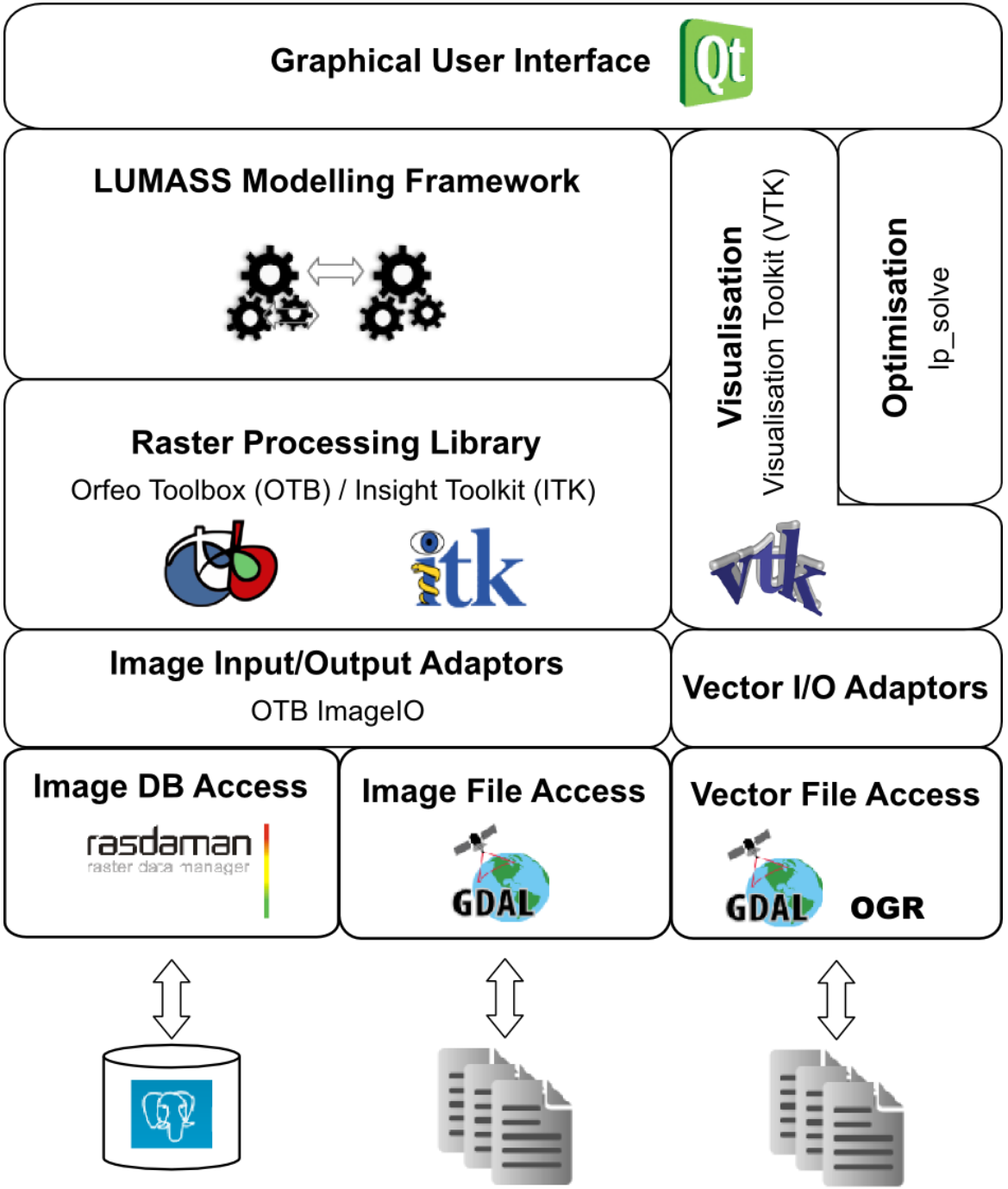
LUMASS - Key features

- Multi-objective spatial optimisation framework
  - Science integration from different domains to support spatial planning
  - Integration of stake holder preferences
  - Optimal spatial resource allocation
  - Identifying trade-offs between conflicting objectives
  - Flexible specification of objectives and constraints
  - Scale independent

- Spatially explicit system dynamics modelling framework
  - Model development for non-programmers
  - Model integration across domains
  - Component-based modelling (Lego brick principle); re-use of components
  - Support for big data and multi-temporal modelling
  - (Immediate result publication via OGC web services (WCS))

- Free and open source
  - No license fees
  - Transparent
  - Extensible

Architecture

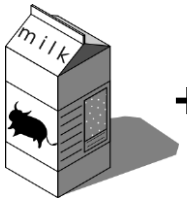


Multi-Objective Spatial Optimisation Framework

ecosystem services indicators

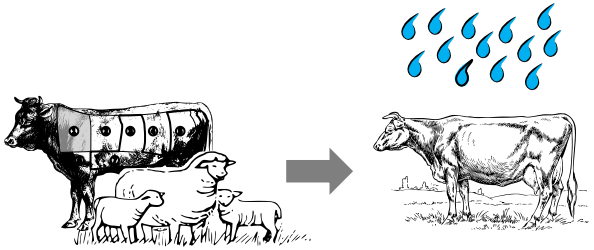
environmental limits

LUMASS
spatial optimisation

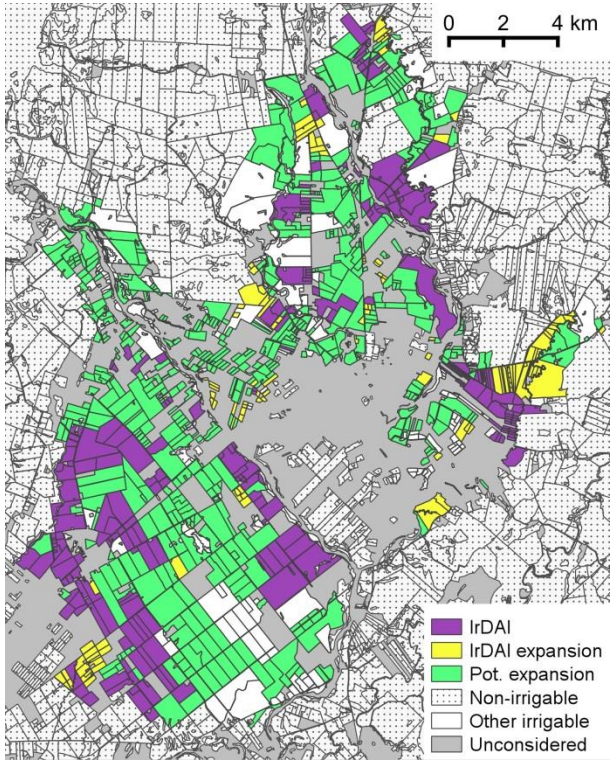


+ 30 %

production targets



land-use conversion options



- Exploring Limits
- Identifying trade-offs
- Discovering Potentials

Spatially Explicit System Dynamics Modelling Framework