



VeRSI

Victorian eResearch
Strategic Initiative

VeRSI Ecoinformatics Program

A.B.M. Russel, eResearch Project Leader
abm.russel@versi.edu.au,
Melbourne, Victoria, Australia

PRAGMA 17 Workshop
30th October, 2009
Hanoi, Vietnam

VeRSI

- Victorian eResearch Strategic Initiative
- 5 Year Program 2006-2011
- State Govt funded
- An unincorporated JV

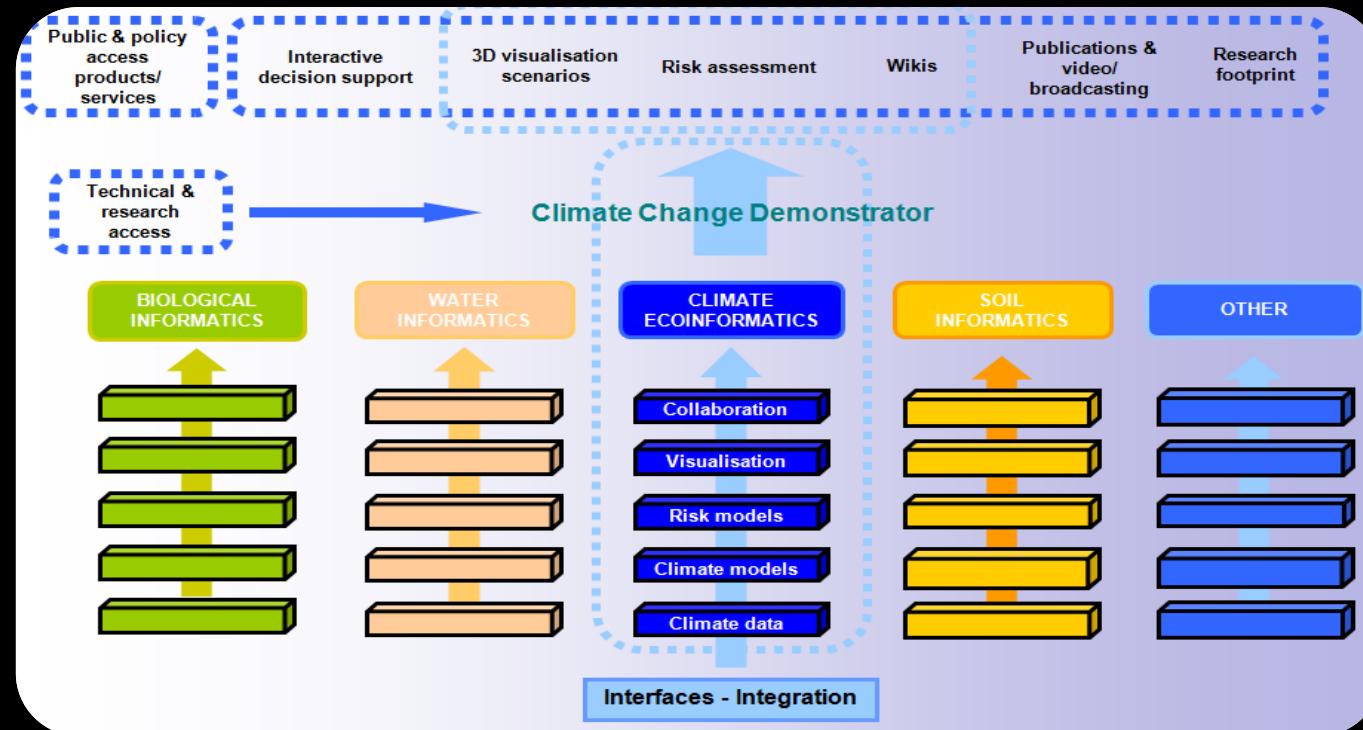
eResearch

- Cyberinfrastructure (US)
- eScience (UK)



Ecoinformatics Program

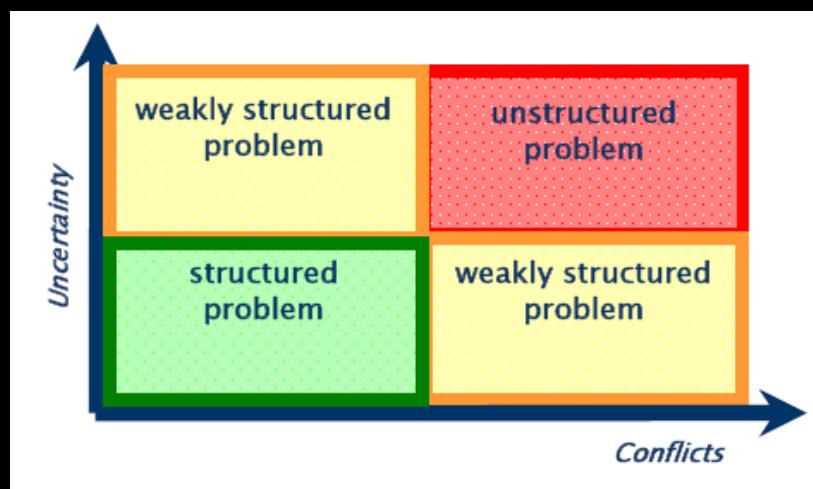
- Goal: An online collaborative and shared resource for managing ecosystem and environmental data and information products.



Wicked Problems

Structured problems are tractable and understandable and often have a single and optimal solution.

Weakly or unstructured problems are characterised by high levels of uncertainty, potential conflicts, or both. Ludwig (2001) called them “wicked” problems with no definitive formulation, no stopping rule, and no tests for a solution.



Donald Ludwig. The era of management is over. *Ecosystems*, 4(8):758–764, December 2001

Climate Change

- IPCC 4th report – “Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level.”

- Climate Change:
 - Mitigation
 - Impacts Adaptation



Ecoinformatics Program

VeRSI Ecoinformatics Climate Change Demonstrator Program

- e-Resource Centre (eRC) Environment
 - Security, Wiki, Repository
 - Models, Information & Data
 - Virtual Organisation
- MIKE Metadata Registry
- Workflow Platform
- Geospatial Visualisation



Overview Demo



Image NASA
© 2005 Europe Technologies
© 2006 Tele Atlas
© 2006 Bassinsoft

©2006 Google™

Virtual Organisation

- Virtual Organisation is group of people or organisations who share resources and skills to achieve a common goal.
- Example VO Services are
 - Shared project activities
 - Secure shared space
 - Secured content sharing
 - Collaborative discussions
 - Shared computation & communication
 - Distributed data store

Requirements for collaboration

- Service or Content sharing
 - Protection
 - Integration
 - Authorisation
 - Access Control
 - Management

Building a Secure VO - AAA

- Shibboleth is an architecture that enables organisations to build single sign-on environments that allow users to access web-based resources using a single login.
- Open standards: Security Assertion Markup Language (SAML)



Shibboleth Components

- Identity Provider
- Service Provider
- Federation Identity WAYF (Where Are You From)

Trust Federations Worldwide

Shibboleth:

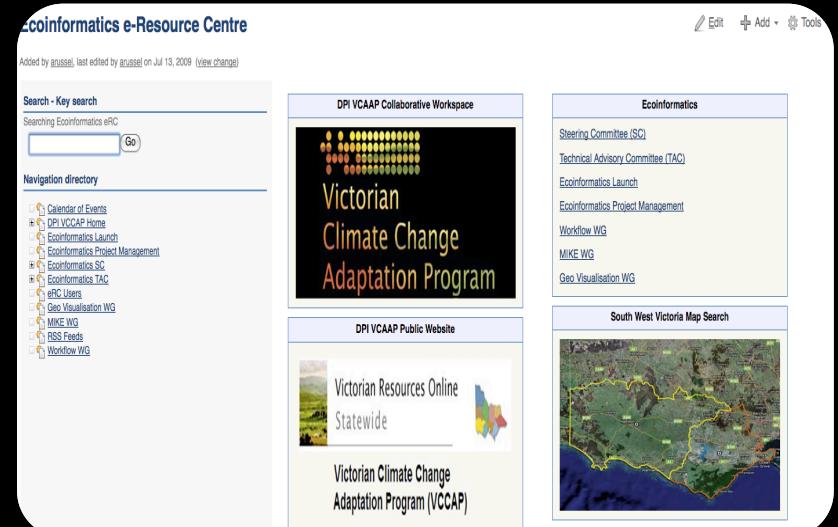
- Australian Access Federation
- UK Access Management Federation
- SWITCH Federation
- US InCommon Federation
- Finish HAKA Federation

Grid Policy Management Authority:

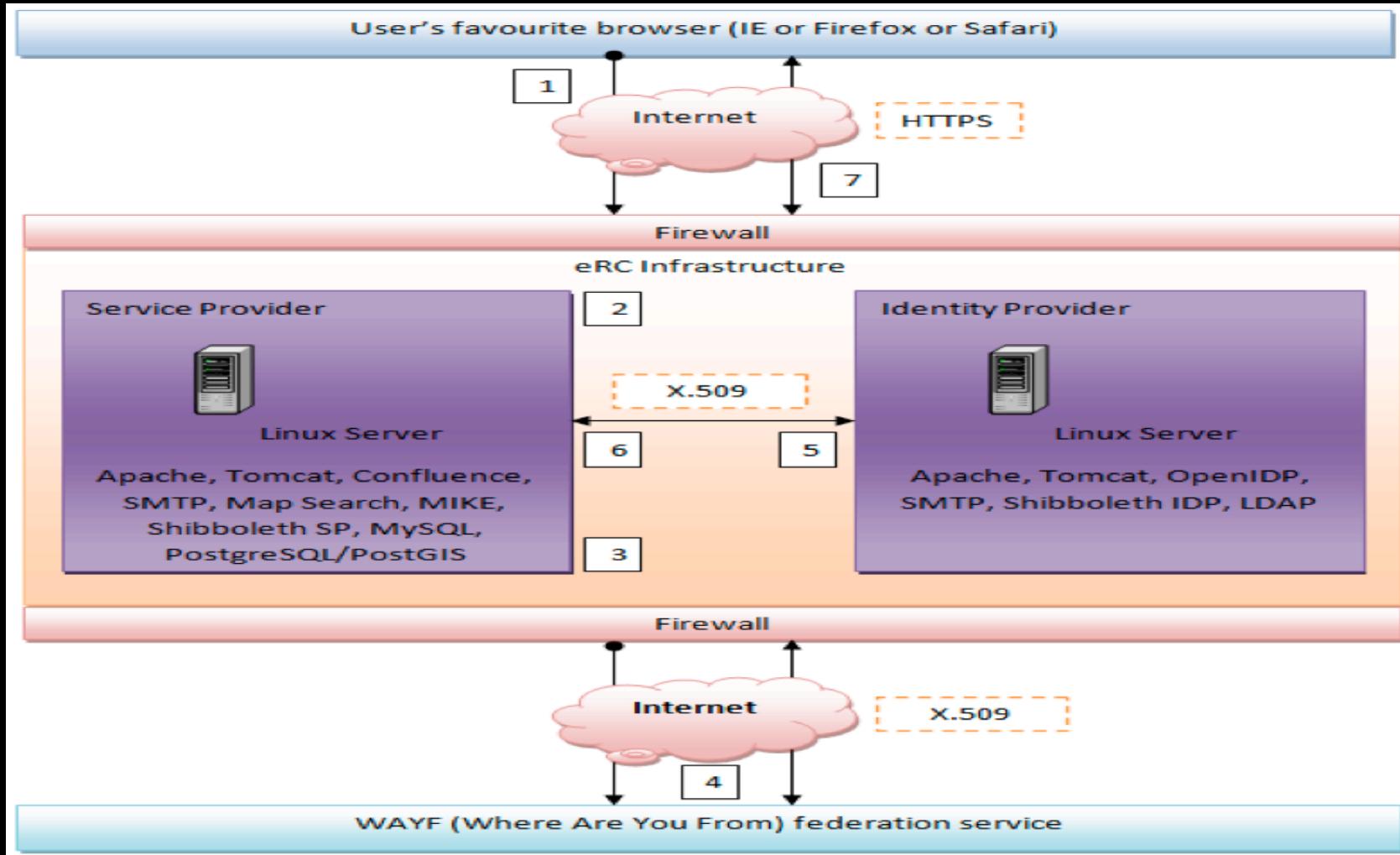


e-Resource Centre (eRC) Platform

- Neutral – sits on VeRSI environment
- Trustable
- Provides:
 - Sensitivity
 - Data Integrity
 - Integration
 - Accessibility by Government and Universities
 - Manage the research process



Architecture



Challenges we faced

- Whether sharing services or sharing data:
 - Who owns it?
 - Who runs it?
 - Who gets credit?
 - Who maintains it?
 - Who shuts it down?
 - Who retains it?



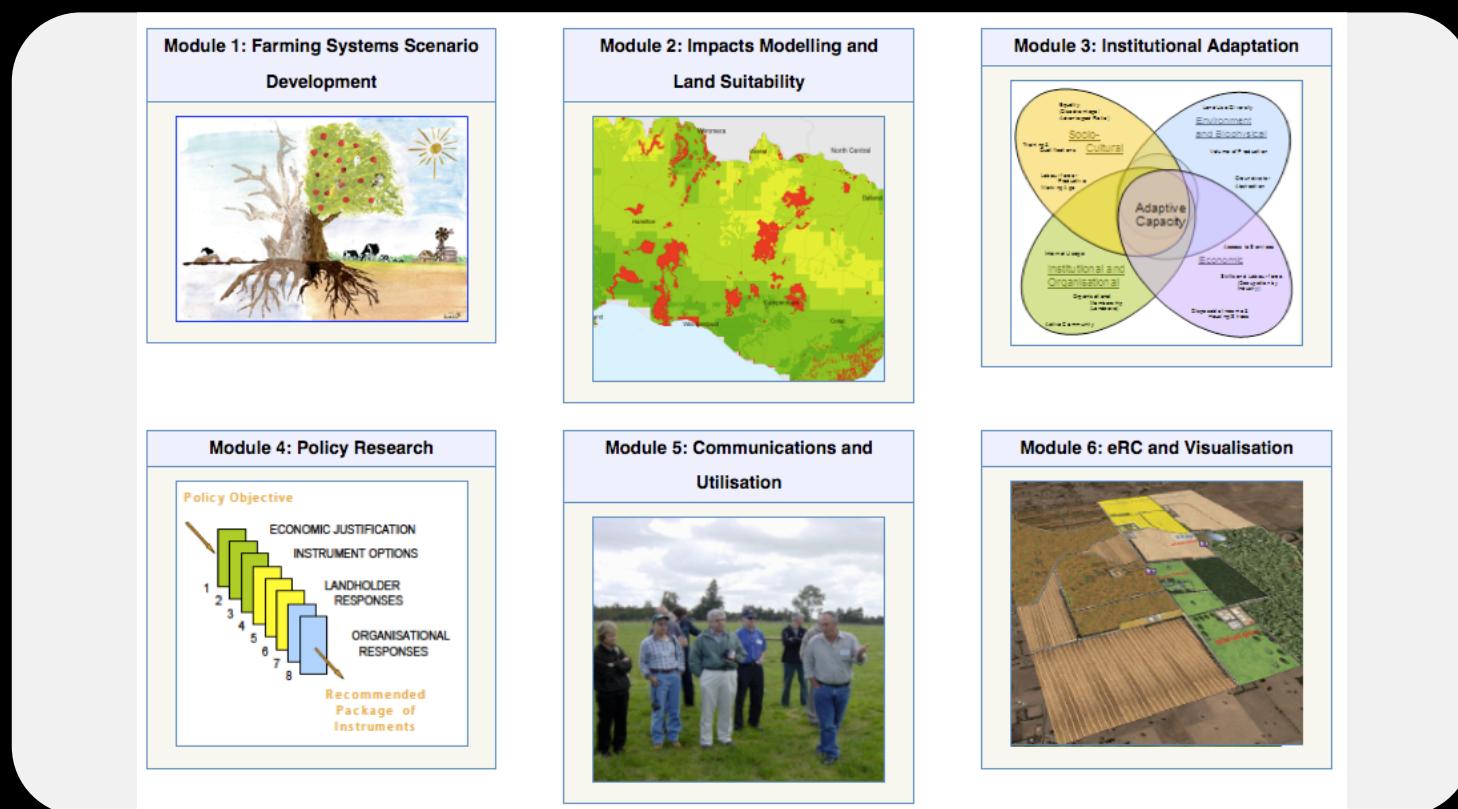
Geo Model Information Knowledge Environment (MIKE)

- A metadata registry for environmental models used in land suitability analysis



VCCAP

Victorian Climate Change Adaptation Program



MIKE Modules

- Query Module
 - Model Description
 - Model Instances
 - Model Versions
- Spatial Query Mapping Module
- Administration Module
 - Recording
 - Updates

MIKE Query Module

- FOSS: Ext, DWR, JPA, PostgreSQL

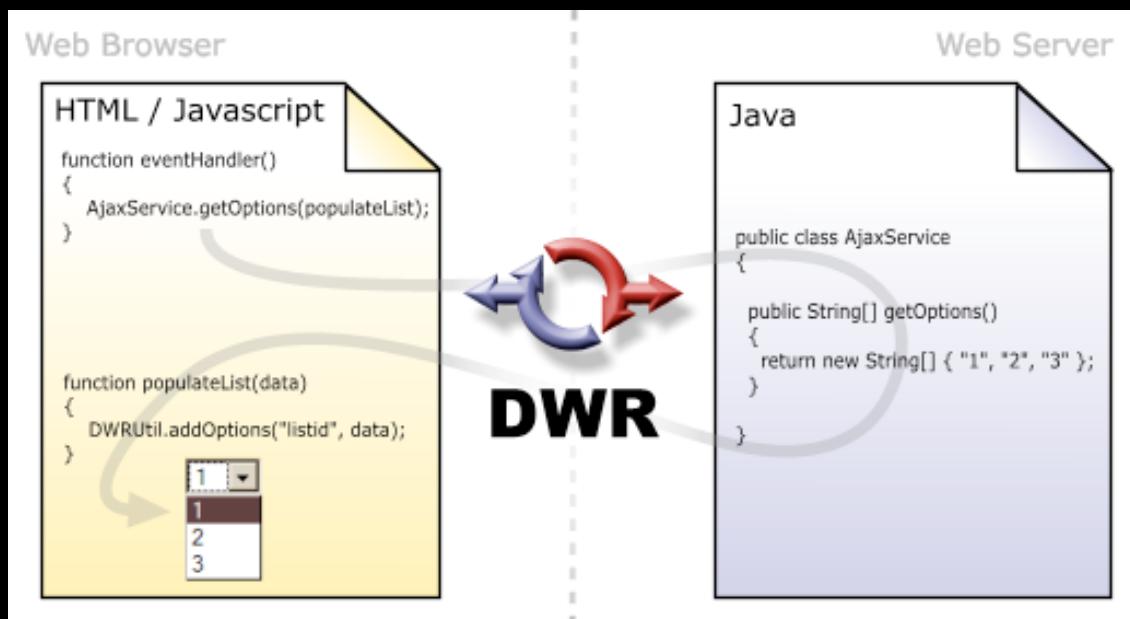
The screenshot shows the MIKE Query Module interface. At the top, there are three tabs: 'Query Module' (selected), 'Map Module', and 'Admin Module'. Below the tabs is a search criteria section with 'Search:' dropdown set to 'Model Names' and 'For:' input field containing 'enter search term'. To the right is a table titled 'CAT Model Group - Model Descriptions (3)'. The table has columns: Description Type, Description ID, Registered Date, Record Owner, and Record Behaviour. The data is as follows:

Description Type	Description ID	Registered Date	Record Owner	Record Behaviour
Abstract	38	Mon, 25 Feb 2008	sw10	
Abstract	36	Thu, 29 Nov 2007	sw10	
Abstract	37	Mon, 25 Feb 2008	sw10	

Below the table is a 'Results Summary' section with a tree view of model categories: Existing Models, APSIM, and CAT. Under CAT, 'CAT Model Group' is selected, which is highlighted in blue. Other items under CAT include 'CAT 1D' and 'CAT 1D Water Balance submodel'. A descriptive text block below the table states: 'The CAT 1D is an enhancement of the one-dimensional model called PERFECT (Productivity, Erosion and Runoff Functions to Evaluate Conservation Techniques) (Littleboy et al 1989). CAT 1D contains sub-models that simulate soil water balance, crop growth, soil erosion, crop residue and crop cover. It also has nutrients (N only), salt and livestock models. All biophysical processes are simulated on the basis of daily timesteps.'

DWR

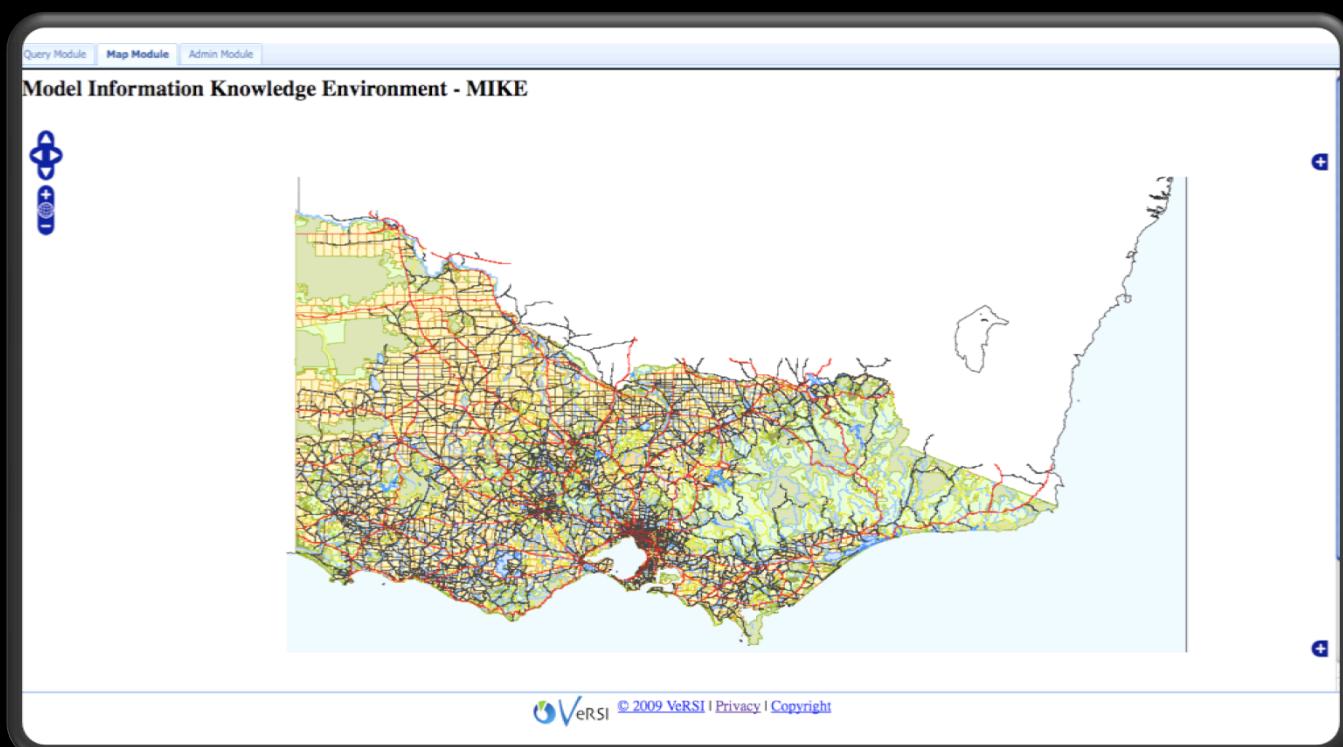
- Direct Web Remoting (DWR) is a RPC library which makes it easy to call Java functions from JavaScript



Source: <http://directwebremoting.org/dwr/index.html>

MIKE Mapping

Using OGC reference implementation
FOSS: Geoserver, OpenLayers, PostGIS



Demo

Thank you!

www.versi.edu.au

