



ERIC

RESOURCE APPLICATIONS

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Local Government

Application

ERIC provides a comprehensive suite of products and services to meet the needs of Local Government in addressing regional development and environmental compliance. ERIC personnel and consortium members have extensive experience in producing and integrating information on infrastructure, natural and social resources for local governments. Support has also been given in developing information management systems and providing training in the use of the resource intelligence.

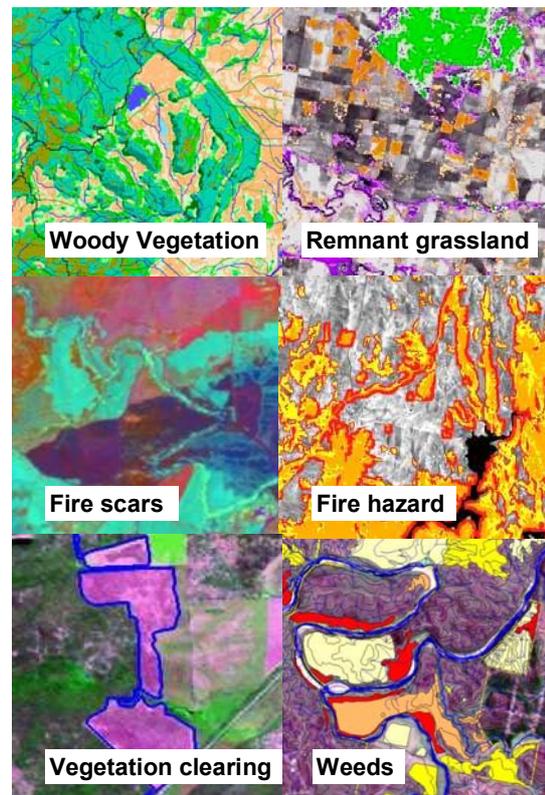
Approach

Spatially detailed information on natural, built and social resources is developed, integrated and analysed to provide intelligence to improve planning and management. Modern technologies are used to provide high quality, reliability and cost reductions. Support is provided to ensure effective uptake and application of the highly detailed information.

The range of products is comprehensive to address all Council needs for resource intelligence and to allow selection of products that best address identified requirements. A staged approach is often used whereby the requirements are reconsidered at each stage of a project.

The information is provided as digital maps in GIS to ensure effective and efficient access and to facilitate application. This presentation also allows rapid production of purpose specific reports and maps as desired.

Vegetation



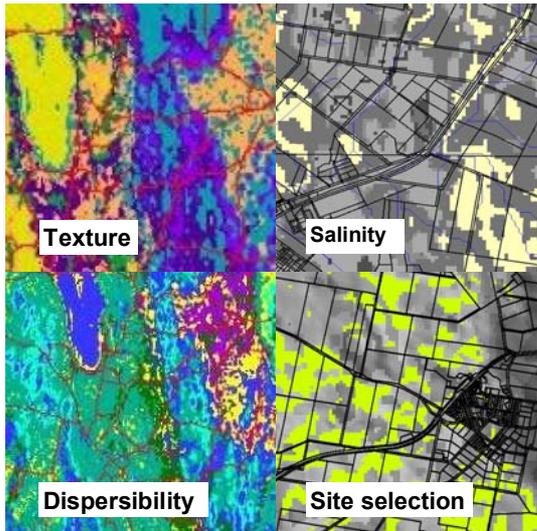
Product Range

ERIC develops new information on vegetation, soils, and groundwater resources from remotely sensed data. New information is also derived from existing information, such as climate records. This is integrated with existing information on natural and social resources to address specific needs.

Reference information developed by ERIC from imagery includes detailed maps of:

- Vegetation / Land cover
- Soil
- Subsoil constraints

Soils



Existing information accessed, compiled, and developed to allow for integration includes:

- Terrain
- Climate
- Infrastructure
- Social constraints

Products developed from this information include maps of:

- Salinity hazard & risk
- Fire hazard

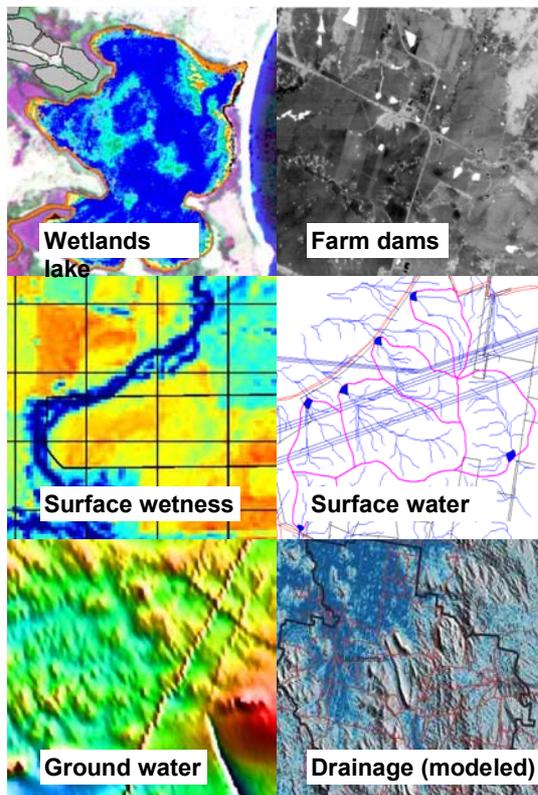
- Surface water and cold air drainage
- Services based on the information include:
- Peri-urban development concept planning
 - Groundwater bore location
 - Waste water disposal
 - Enterprise site selection
 - Environmental risk assessment
 - Environmental impact assessment
 - Environmental management information systems
 - GIS development

Vegetation / Land Cover

Satellite imagery is used to map current and historic patterns of vegetation and land use. Field observations are used to label the map categories. Client participation in the field observations facilitates information transfer.

The fire hazard map illustrates development of information from a reference vegetation map to address specific requirements. The reference map can also be used to map attributes such as urban spread, native woody vegetation, remnant grasslands, waterlogging and bare ground. The information can be cost effectively used to monitor changes in land use and land condition.

Water



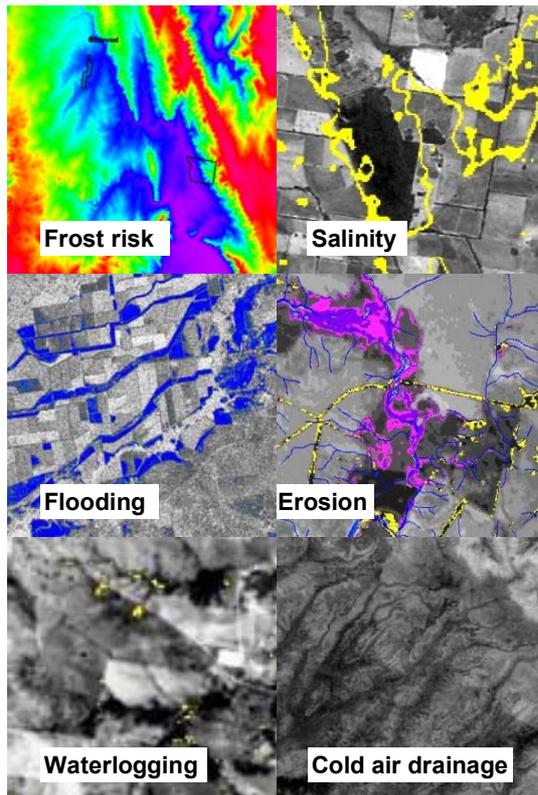
Soil Mapping

Soil maps are cost effectively developed from radiometric images using technology developed and commercialised by ERIC. The maps give information on soil properties important for land management such as pH, texture and salinity. Paddock level detail is achieved with regional coverage where regional information is used in council planning.

The detailed information on soil properties is obtained through field sampling and laboratory analysis. As with vegetation mapping, client participation facilitates application of the information.

Information on soil properties allows production of purpose specific maps, such as salinity risk and hazard. Such maps have been used to identify how adverse salinity impacts

Risks



have arisen. Together with other information on soil properties the salinity results allow identification of hazard and risks and provide the information needed to plan and implement remediation.

Subsoil Constraints

Airborne geophysical and satellite imagery are used to provide information on subsoil conditions. Airborne radiometrics identify fractures associated with preferred pathways for water flow while magnetics identify deep subsurface structures.

The data allow identification of subsurface geological structures such as fault lines, fractures and boundaries between geological formations. This information is used to target ground observations for locating sites prospective for groundwater bores.

Climate

Climate products address general constraints on land uses such as crop selection, fire risk and waste water disposal. Maps of climate surfaces for rainfall, temperature etc. are sourced from the Bureau of Meteorology or developed from station records, terrain and

other information. The data are analysed to develop further information such as frost risk.

This intelligence is used with information on terrain to address issues such as frost risk and surface water yields. It is combined with knowledge of plant performance for crop site selection.

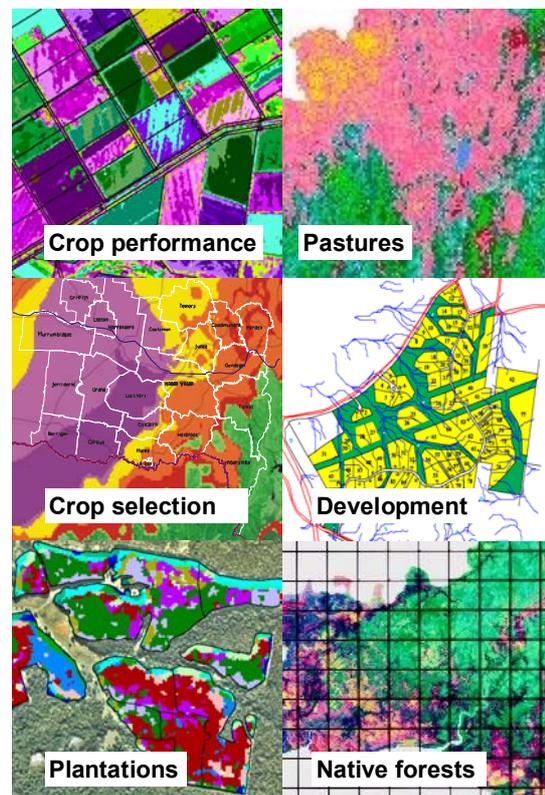
Risk Factors

Some risks can be modelled, as with frost, but there are always discrepancies between predictions and reality. Wherever possible risk assessments are derived from measured data, as with mapping floods using satellite radar. Frost risk prediction can be improved by mapping patterns of cold air drainage using night time thermal imagery or by modelling drainage accumulation. Erosion and waterlogging can be mapped using satellite imagery and salinity using airborne geophysical data.

Data Integration

The resource information can be variously analysed to derive intelligence to address specific enterprises such as site selection for

Development



new crops, forest plantations, peri-urban development and waste disposal. For some enterprises knowledge of the regional market potential and infrastructure is necessary for a sound decision.

Information Management

Environment & Business Planning

A Generic Environment Management Methodology was designed to cost-effectively address environmental issues. Modules are linked in a feedback cycle to achieve continuous improvement in performance. The ERIC products and services provide the basic components for implementing this management system that incorporate the ISO1404 principles for environment management.

Risk Management Assessment

A risk assessment methodology developed to provide a rapid and comprehensive means of ensuring all planning and management issues are identified and addressed. The method pinpoints deficiencies and can provide a statistical evaluation of performance. Such assessment provides the basis for the development of plans and actions essential to demonstrate environmental and management compliance. The risk assessment method allows for self assessment and the quantitative

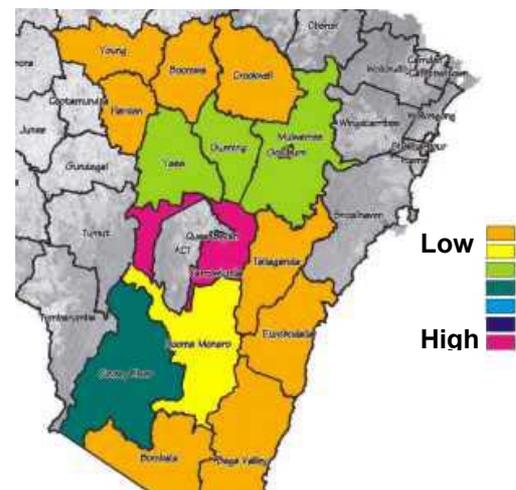
result can be used to monitor performance.

Environmental Impact Assessment

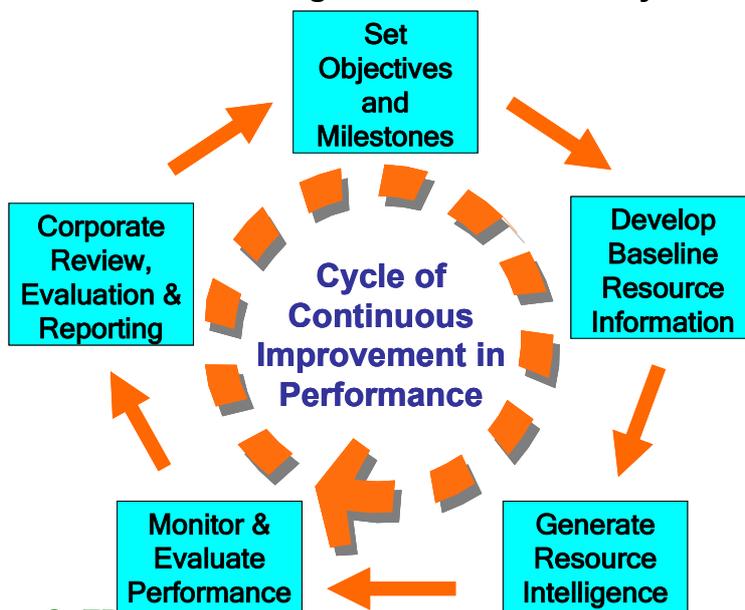
A generic method has been developed to rapidly assess the economic, social, and environmental impact of proposals.

The method identifies priorities and provides a quantitative measure of performance in addressing environmental impact. It allows for self assessment and can provide statistical comparison of different options. The method provides a means of comparing the highly disparate economic, social and environmental impacts. This allows ranking of alternatives and the focusing of effort where it is needed. The method promotes community involvement and education and provides most benefit when used at the beginning of the assessment process.

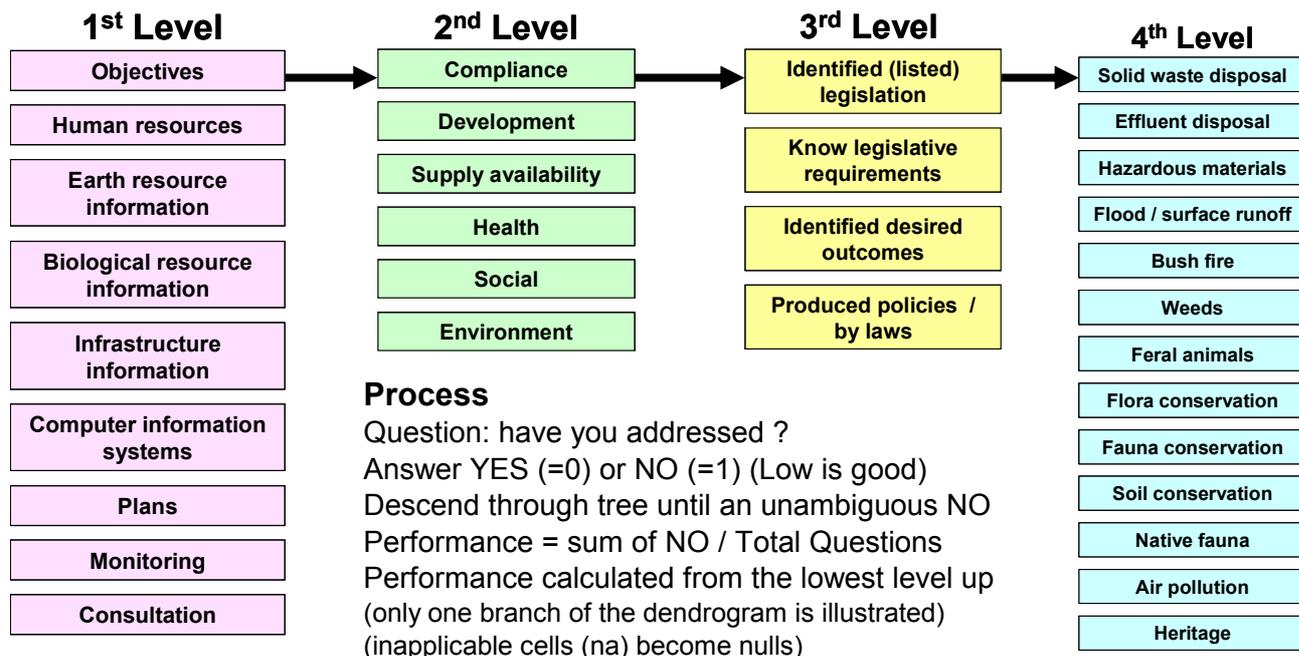
Household incomes for shires surrounding the ACT



Environment Management Information System



Risk Management Assessment



Environmental Impact Assessment

Landscape Element	Landuse Activity	Economic	Social	Environment
Urban Land	Agriculture	Production	Employment	Vegetation
Rural Land	Forestry	Supply	Health	Native plants
Industrial Land	Horticulture	Transport	Social Services	Weeds
Waterways	Housing	Demand	Education	Native animals
Littoral	Retail	Personnel	Communications	Vermin
Offshore Marine	Manufacturing	Power	Public Transport	Water yield
	Tourism	Water	Heritage	Water quality
	Recreation	Sewage	Noise	Soil health
	Fishing	Roads	Dust	Soil erosion
	Mining	Communications	Air pollution	Soil salinity

The economic, social and environmental attributes are evaluated for every combination of Land Use Activity and Landscape Element. Each cell is scored with a +1, 0 or -1 (an impact can be positive, neutral, or negative). Inapplicable cells (na) are nulls.

The scores can be variously presented as:

- average score for all entries
- average score for combined positive and negative entries
- separate totals for positive and negative scores.

Results are given as a proportion for each category when comparing between the social, economic and environmental categories.