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Enterprise Assessment

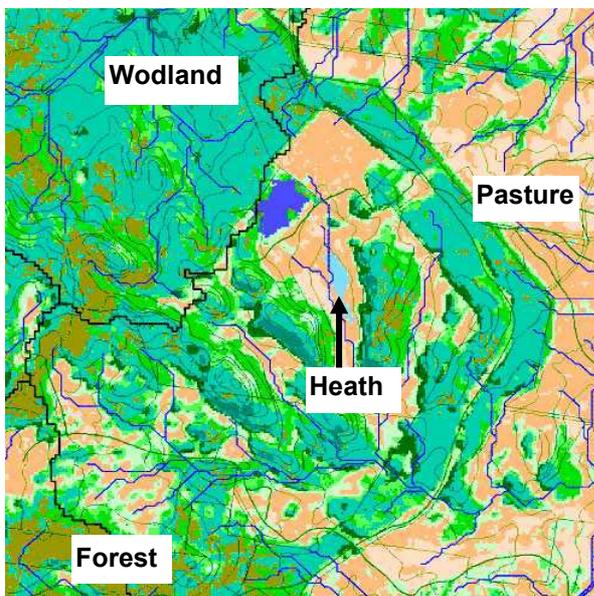
Application

Uncertainties when addressing enterprise development relate to the suitability of the land for the purpose. Is the land suitable for the intended purpose by way of production and environmental sustainability? Do sites exist that are better suited? With existing landholdings, what are the alternate potential profitable and sustainable alternate land uses?

Many decisions with enterprise development are pragmatic in reflecting a single factor, such as proximity to existing business or the availability of water. This simple approach to decisions largely arises because of deficiencies in information. The resource intelligence needed for an informed decision



Vegetation map from satellite imagery



either does not exist or is dispersed and difficult to assemble and use.

The ERIC range of products provides information to identify potential opportunities and identify the best locations for particular activities. The scope can be broad, such as mapping areas of Australia climatically best suited to high value tree species, or highly specific, as with identifying the sites best suited to viticulture and the most appropriate grape varieties.

The environmental and social resource information can be used in meeting statutory environmental requirements as well as for business planning. Provision of high quality resource intelligence reduces risk by improving business and environmental outcomes.

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 and reliable information and reduce costs. Support is provided to ensure effective uptake and application of the detailed information.

A comprehensive range of products and services addresses a wide range of developments and allows clients to select products that best meet their needs. A staged approach can be used whereby requirements are re-evaluated at each stage of a project.

The information is provided as digital maps in GIS to ensure effective and efficient access

and facilitate application. This presentation also allows rapid production of purpose specific reports and maps as desired. The visual presentation aids in statutory presentations and public promotion as well as business planning.

Product Range

ERIC has a core capability to develop new information on vegetation, soils, and groundwater resources from remotely sensed data. New information is also derived from other data, such as climate records. This is combined with existing information on natural and social resources and analysed to address a clients needs.

The reference information developed by ERIC includes detailed maps of:

- Vegetation / Land cover
- Soil
- Subsoil constraints

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

- Terrain
- Climate
- Infrastructure
- Social constraints

Products developed from this information include maps of:

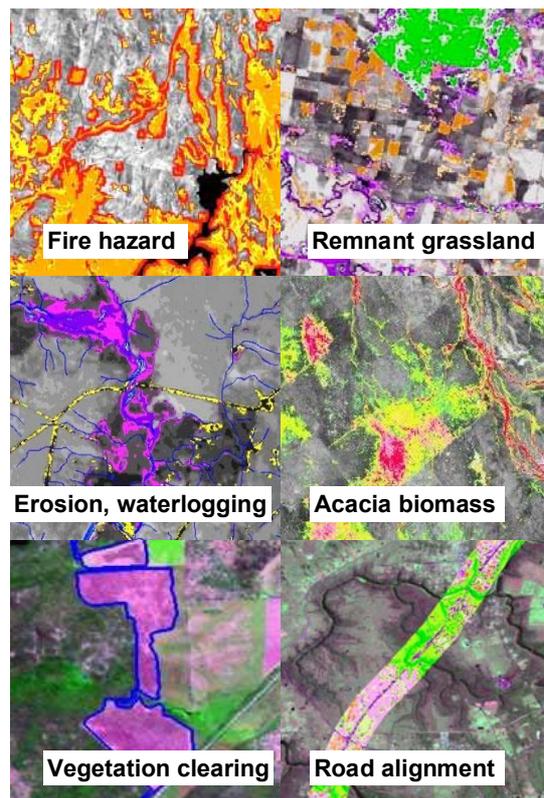
- Salinity hazard & risk
- Fire hazard
- Surface water and cold air drainage
- Flooding

Services based on the information include:

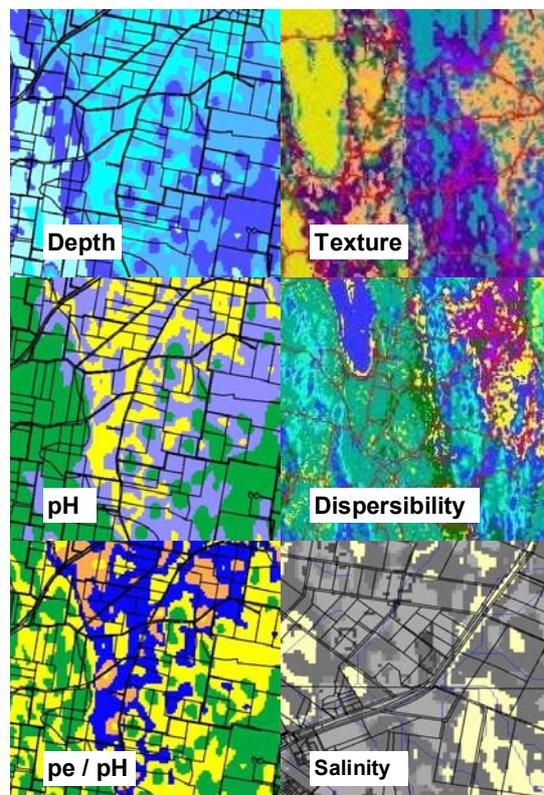
- Enterprise site selection
- Environmental risk assessment
- Environmental impact assessment
- Environmental management information systems
- Peri-urban development concept planning
- Groundwater bore location
- Waste water disposal
- GIS development

The services are based around the integration and application of these products. They

Vegetation



Soils Properties



include consultation as well as system development and the provision of ongoing support.

Products

Vegetation / Land cover

The information developed from satellite imagery addresses many needs. Mapping native woody vegetation identifies land now generally quarantined from clearing while remnant grasslands are also potentially quarantined from development. Impacts such as erosion and waterlogging can be mapped to identify risks and improve land management. This information can be cost effectively obtained for extensive developments such as roads, and pipe and power lines.

The fire hazard map, developed to a statutory specification, further identifies constraints to development. The mapping of the exotic prickly acacia identifies the extent of this weed but also quantifies the abundance of a valuable resource.

Soil Properties

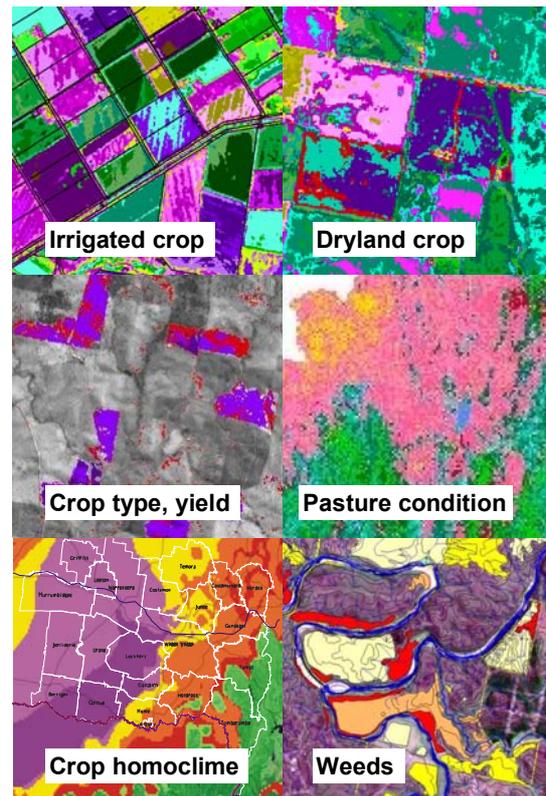
Soils affect virtually every land use and are generally critical for agricultural enterprises. However, the necessary soils information is rarely available in the detail and form needed for decisions on enterprise development. The ERIC method is designed to cost effectively provide detailed information on the soil properties that affect developments.

The mosaic identifies soil properties that are routinely mapped at paddock level detail across regions. All of these properties affect the performance of plants and susceptibility to risks such as erosion, waterlogging and salinity. The detailed mapping of surficial salinity allows identification of existing hazards and risks and the potential for change.

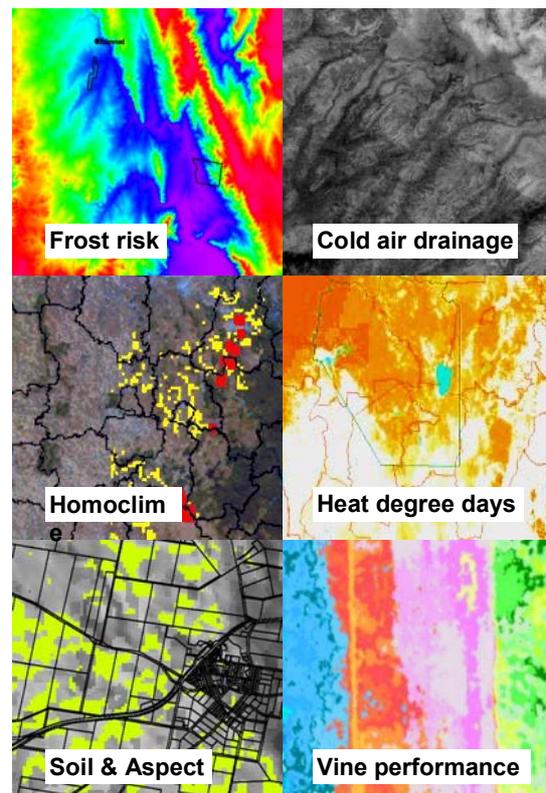
Agriculture

Many of the products addressing agriculture represent specific applications of vegetation and land cover mapping. Maps can identify the land use and condition of crops. Specific crops can often be identified from the imagery and variations in yield mapped. This information is combined with ground observations to determine the reasons for yield

Agriculture



Viticulture



variations to provide for improvements in management performance.

The imagery also allows monitoring of pasture condition and can be used for mapping weeds. In this example the imagery provided the

reference for detailed field observations. In other situations a weed can be mapped directly from the satellite imagery when the ecology of the species is known, as with prickly acacia.

Other agricultural products address site selection. Homoclimes are used to match climates with locations where particular crops are known to perform well. Detailed site selection is achieved by combining this information with information on soils and terrain.

Viticulture

Viticulture represents a special agricultural case. Grape vines can grow under a wide range of conditions but the risks, fruit quality and profitability of enterprises are highly site dependent. Frost risk and cold air drainage identify the potential risk from frost early in the season.

Homoclimate analysis can be used to compare climates for premium vineyards in Europe with those in Australia. A more sensitive analysis is given by heat degree days where this allows selection of varieties appropriate to the climate at potential sites. This is combined with information on soil properties and terrain to identify the most suitable sites for particular varieties.

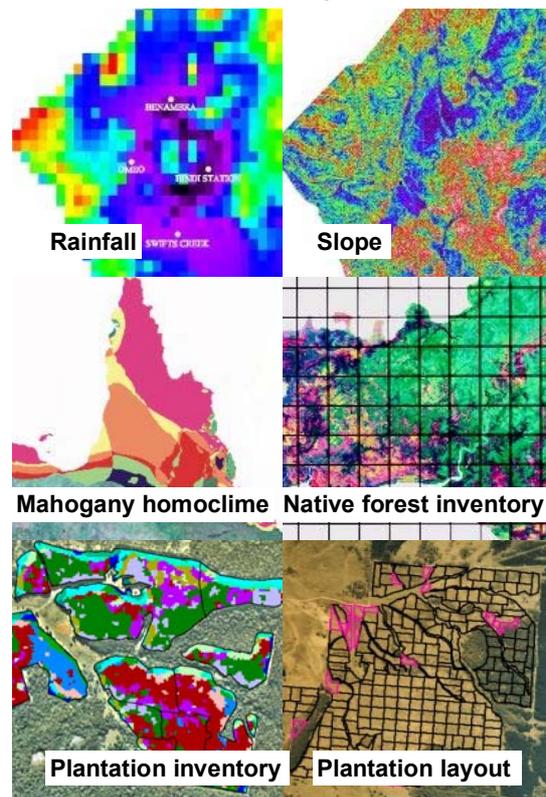
Satellite and airborne imagery can be used to monitor the development of viticultural regions and vine performance.

Forestry

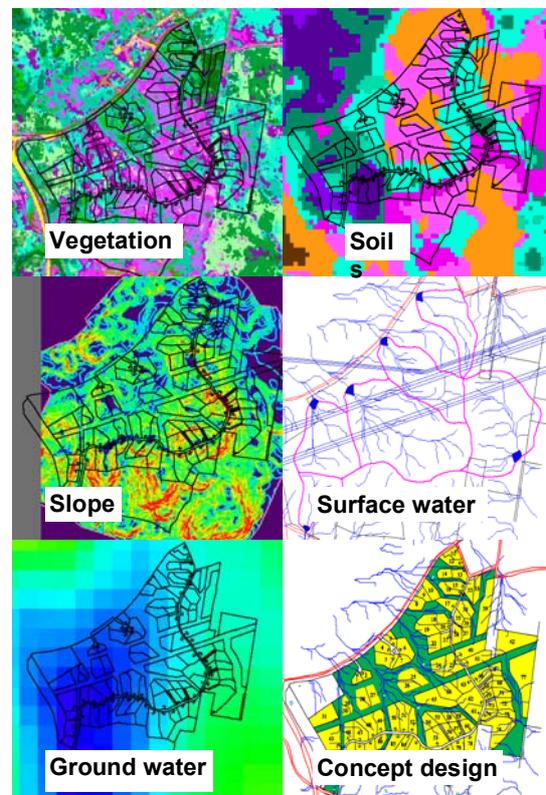
The information developed for forestry is similar to viticulture but is usually much more extensive. It involves regional assessment of the suitability of soils and climates and the occurrence of exclusions such as high slopes and native woody vegetation. This information identifies the extent and suitability of available land. Detailed plantation development maps are produced for compliance and development.

Satellite imagery can be used to improve the cost effectiveness of plantation inventory. In remote areas this often provides the only means of obtaining a reliable assessment of the native forest resource.

Forestry



Peri-urban development



Peri-urban development

The information produced for peri-urban development includes the detailed information on soils, vegetation, terrain and

climate identified above. The main differences relate to the need for additional analyses to address water yields and disposal. Groundwater assessment is usually also conducted as this provides a cost-effective means of addressing the requirement for water supply.

Environmental Management Information Systems

The 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 that provides 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 that assesses the economic, social, and environmental impact of proposals.

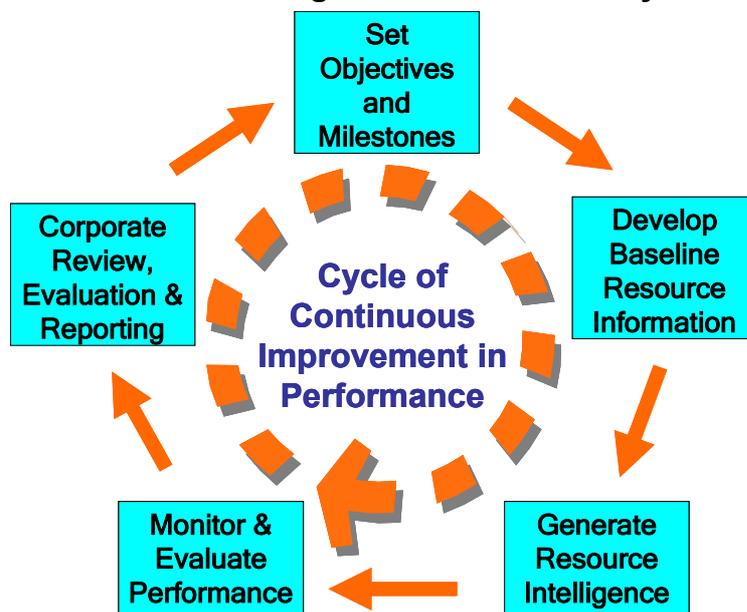
The method identifies priorities and provides a measure of performance in addressing environmental impact. It allows for self assessment and can provide statistical comparison of different options. The method provides a means of comparing the highly disparate economic, social and environmental impacts.

The method was designed to be fully comprehensive and transparent but be simple to allow for application and appreciation by community groups. It is cost-effective and designed to prevent inappropriate application of results. Overall it:

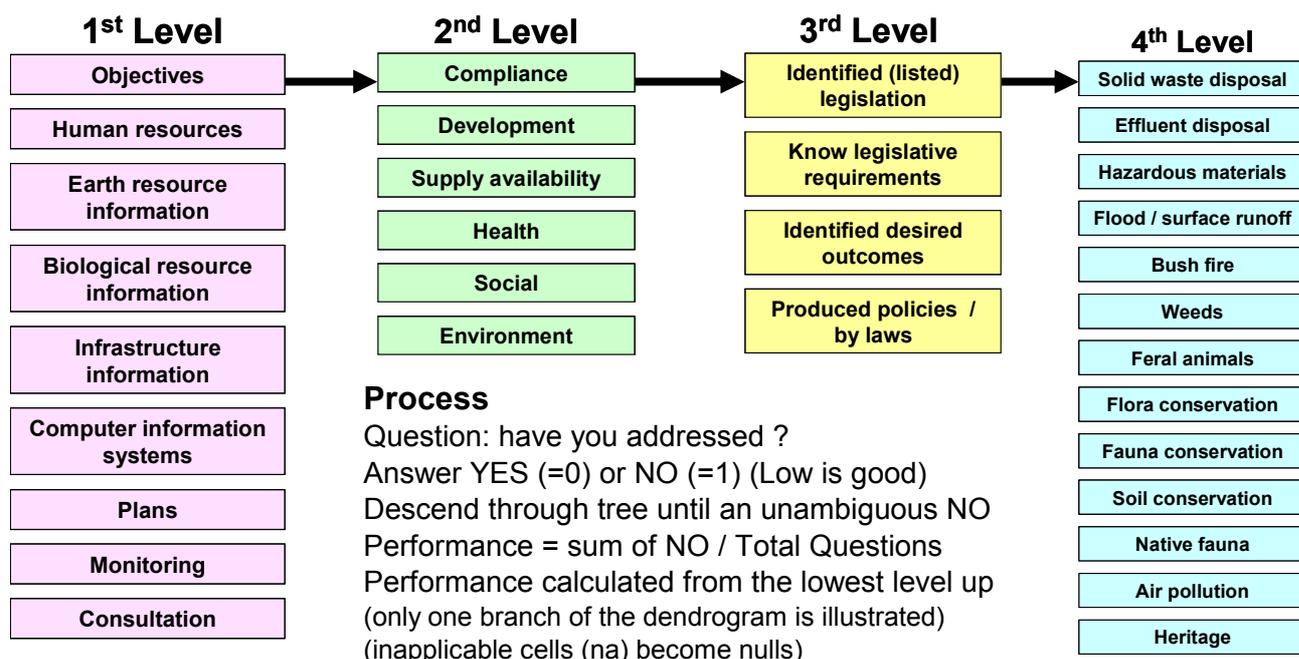
- Identifies all potential impacts, good and bad
- Allows ranking of alternatives
- Allows focusing of effort where it is needed
- Promotes community involvement and education

The method provides most benefit when used at the beginning of the assessment process.

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.