



ERIC

RESOURCE APPLICATIONS

Environmental Research &
Information Consortium Pty Ltd
(ABN) ACN (81) 055 194 771
Ph 02 4842 8182
Ph 02 6161 3716
Fax 02 4842 8183
info@eric.com.au
www.eric.com.au

RURAL RESIDENTIAL DEVELOPMENT

Introduction

ERIC provides products and services to support large residential developments, particularly in rural areas.

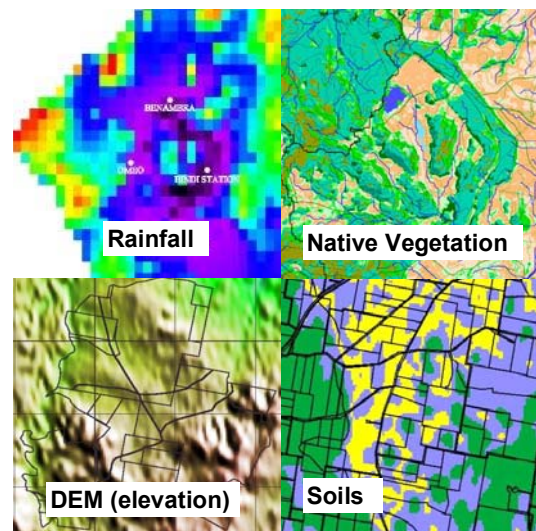
The ERIC capability centres on mapping and evaluating environmental information to support sustainable development. The information is used for environmental assessment and planning, and provides a cost-efficient means of addressing requirements for environmental compliance. The information also promotes the development of a desirable residential environment, and provides marketing benefits.

Information developed includes vegetative cover, species distributions, surface and ground water resources, and soil mapping. This is combined with existing information to address specific needs. Assessments include terrain evaluation, water harvesting, and the suitability of soils for wastewater disposal.

The information can be used to reduce risk and costs and identify alternate development options, thereby increasing profitability and sustainability.

Regional Climate

Climate affects considerations such as water availability, the disposal of wastewater, and the appropriate location and orientation of dwellings.



Climatic data that can be mapped for regions include:

- Temperature
- Rainfall
- Evaporation
- Humidity
- Sunshine hours

Additionally, data on terrain and climate can be analysed to map constraints such as frost risk and cold air drainage. Other hazards deriving from terrain and climate, such as flooding and waterlogging, can be mapped using different forms of satellite and airborne imagery as well as being modelled.

Site Characteristics

Vegetation

Statutory regulations affect the clearing of land for development. Satellite imagery and ground observations are used to map the vegetation and hence address requirements under land clearing acts. The vegetation map can also be used to map fire hazard according to NSW Rural Fire Service regulations. Aerial photography can similarly be used, but at higher cost and with lower discrimination.

The vegetation maps are also used to address conservation requirements under species and habitat legislation. They are used to identify the extent of habitat and vegetation types and the occurrence and distribution of habitat potentially suitable for rare and threatened species. Such stratification of sampling increases the efficiency and effectiveness of field observations.

Terrain

Site characteristics moderate the general climate. Aspect is importantly where northerly aspects are desirable in cool

climates and westerly aspects undesirable in warm environments. Slope and position in the landscape affect temperature through cold air drainage. Patterns of cold air drainage can also be mapped using night time thermal imagery.

Elevation data are used to map slope, aspect, and drainage where slope is a prime control in development. The data are used to map patterns of water accumulation similarly to cold air drainage. Thermal imagery can also be used to map patterns of surficial subsurface water flow.

Cultural Sites

The vegetation map produced from satellite imagery can be used in conjunction with information on terrain (ridges, stream lines etc) to improve the efficiency of cultural surveys.

Soil

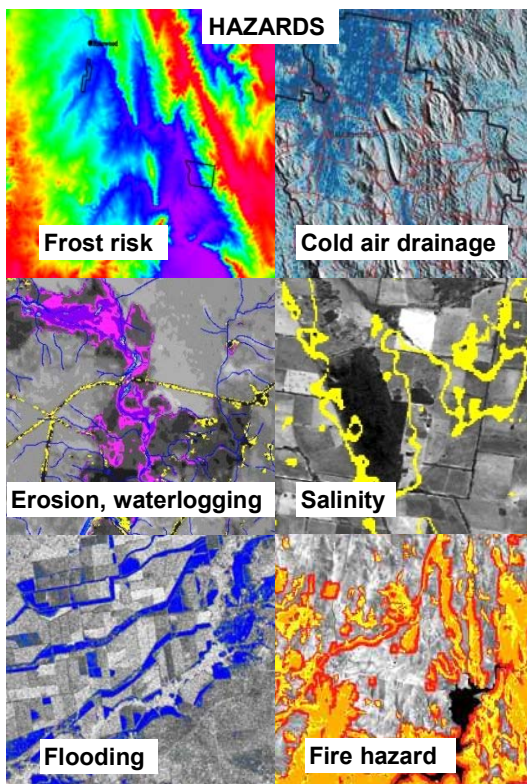
Soils affect developments by way of:

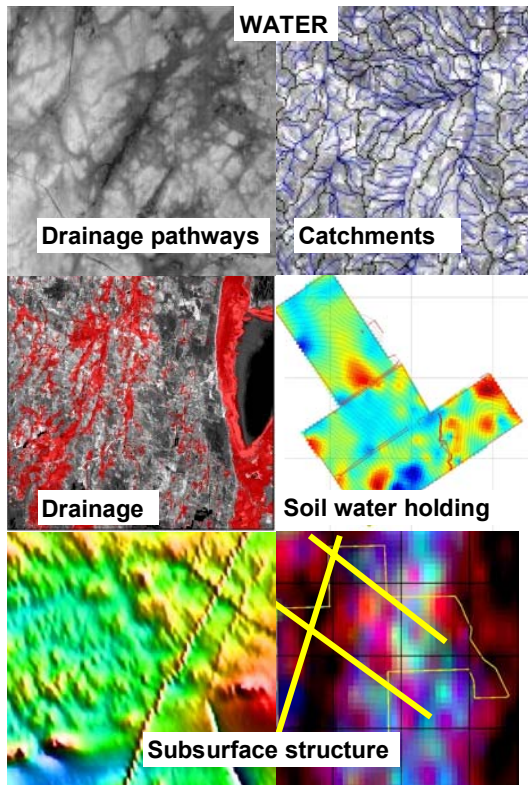
- Construction materials.
- Building foundations
- Disposal of waste water.
- Vegetation development.
- Potential risks, such as salinity and erosion.

The prime needs are to ensure that the soils do not pose a risk to the structural integrity of buildings, and that the impact of the development will not produce adverse environmental impacts such as erosion and salinity.

ERIC uses different techniques to map soils depending on the availability of data. All approaches are based on the collection of field information on relevant soil properties but best results are obtained where maps are developed using applicable remotely sensed data.

Highest resolution soil maps are produced using airborne gamma radiation data (radiometrics) and this allows full implementation of the ERIC SoilSelect method. This methodology provides the





most cost efficient and effective means of mapping soils. Maps are produced for different soil properties, such as pH, texture and depth, and the information can be used to identify sites with particular characteristics, such as a deep soil with moderate texture and alkaline pH.

Regions where radiometric data are not available can be addressed by applying a lithological analysis to optical satellite imagery where this identifies the patterns of parent material or mineralogy. The map is interpreted in relation to field soil samples, mapped geology, magnetics, and terrain to identify patterns of soil properties.

For sites where radiometric data are unavailable and highly detailed soils information is required soils are sampled on a regular grid of around 100m. Surface fitting routines are then applied to map the patterns of soil properties.

Additional variables are derived from the measurements to address particular applications, such as waste water disposal. The derived variables include available soil

water holding capacity and readily available water.

Water

Water represents a prime constraint to developments, firstly with availability and then with waste water disposal. ERIC services address groundwater exploration and water balance to assess surface water yields and waste water disposal. The climate, soils and terrain information are used in the water assessment.

The volumes of surface water that can potentially be harvested are determined from rainfall and evaporation and catchment areas derived from digital elevation data. Determining harvestable water additionally takes account of existing demands on catchments. In NSW harvestable rights are now simply determined relative to area of the landholding and the region.

Opportunities for harvesting ground water are identified by combining analyses of remotely sensed data with ground observations. The remotely sensed data are used to identify likely paths for preferred drainage, such as fractures and fault lines. The data used depends on availability but always includes optical satellite and airborne magnetic data. Airborne gamma radiation (radiometric) data are always used when available as they generally contain the most relevant information.

The baseline or reference information is assessed to address specific hazards or requirements, such as salinity risk or the relative suitability of soils for the disposal of waste water. Maps can also be produced that address the suitability of areas for different crops and plant species.

Information Integration

The accurate mapping allows integration of diverse information, such as cadastre, soils and vegetation to produce detailed development and management plans. This

facilitates the addressing of compliance as well as improving planning and management.

The information can be visually integrated through the production of overlays on maps but is most effectively combined using numerical analysis in Geographic Information System (GIS). The derived or final products are then produced as maps that address specific needs or applications.

The ERIC consortium contains personnel experienced in consultation, facilitation, and town planning and this allows the provision of all planning services required for residential development. The capabilities address requirements such as:

- Compliance reporting (e.g. EPBC Act Referrals, EIA, EIS, SEE)
- Hazard and risk assessment
- Waste water disposal
- Design concept plans
- Enterprise development, such as viticulture

ERIC provides a full range of products and services to cost-effectively address development requirements.

