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MAORI VALUES AND GIS

THE NEW ZEALAND EXPERIENCE

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THE INDIGENOUS
MAORI IN NEW
ZEALAND ARE
ADDING A NEW
DIMENSION TO
GIS APPLICATIONS
BY USING THE
TECHNOLOGY
TO STORE
AND ANALYZE
INFORMATION
RELATED TO
MAORI CULTURAL
VALUES.





New Zealand's natural environment is central to Maori life and values

Although the indigenous Maori make up only 14 percent of the total population in New Zealand, a large proportion of that percentage – about 71 percent – have a strong sense of belonging to regional or geographically located tribes (*iwi*) and sub-tribes (*hapuu*). Land, water and air are central to Maori life and values, as they are to most indigenous societies, and Maori regard themselves as *kaitiaki* (guardians) over these natural resources. The Treaty of Waitangi, signed by Maori and the British in 1840, gave rights to the Maori people for all their land, estates, forests, fisheries and everything else regarded as precious, including the natural resources and the Maori language.

To fulfill present-day legislative requirements, information on Maori values must be taken into account in resource management and environmental planning. However, the lack of information on Maori values in planning databases, coupled with the

sensitivity and confidentiality of storing this type of information and the problems in gaining access to it, have made legislative requirements difficult to meet.

The retention of Maori knowledge by Maori, the need to record vast amounts of spatial information in treaty claims for historic land grievances, and to record and store Maori values information for resource management legislation are factors which have led to an increasing interest in the development of tribally-owned and managed GIS tools for Maori. GIS is perceived to have applications in a number of areas, including resource management, environmental planning, tribal history archiving, tribal and economic development, property management, education, training and social planning.

Examples from both New Zealand and Canada indicate that where GIS is used and developed by indigenous peoples, they add their own cultural imprint and a further dimension to GIS applications. One of the most important aspects of this is the development of GIS tools as complementary systems to indigenous knowledge



The Maori meeting house is a center of cultural activity

Main groups used in Maori values classification	a. National level, central government (national databases, public domain access)	b. Regional and district databases, such as local government. (conditions and criteria required for storing confidential information)	c. Maori databases such as at the <i>iwi</i> or <i>hapuu</i> tribal level (secured protection of information)	d. Individual or group information - extended family (<i>whaanau</i>) or individual (highly sensitive or personal information)
1. vegetation	1a. national or regional data on vegetation and land use	1b. regional or district data on vegetation and land use	1c. local information on vegetation types	1d. special vegetation, such as medicinal plants, plants for weaving
2. animals, birds, fish, insects	2a. national or regional data on animals, birds, etc.	2b. regional or district data on animals, birds, fish, insects	2c. local information on animals, birds, fish, insects	2d. special animals, birds, fish, insects, such as special foods, cultural harvest
3. land, soil	3a. national or regional data on landforms, soils, etc.	3b. regional or district data on landforms, soils etc.	3c. tribal information on land features, landforms, soils, etc.	3d. special landmarks, land features, mounds for weaving dyes
4. water	4a. national or regional data on water	4b. regional or district data on water	4c. tribal information on water	4d. detailed or confidential tribal information on water
5. air	5a. national or regional data on air	5b. regional or district data on air	5c. tribal information on air	5d. detailed or confidential tribal information on air
6. special places	6a. limited information on special places, cultural sites	6b. regional and district information on special places, cultural and historic sites	6c. tribal information on special places, cultural and historic sites (such as archaeological sites)	6d. detailed family and tribal information on special places, cultural and historic sites (such as archaeological sites)
7. sacred sites	7a. little or no information at the national or regional level	7b. regional and district information on some sacred sites	7c. tribal information on sacred sites (such as burial grounds)	7d. detailed family and tribal information on sacred sites (such as burial grounds)
8. metaphysical	8a. no information at the national level	8b. no information at the regional or district level	8c. tribal information on metaphysical (spiritual, cosmology) information	8d. detailed family and tribal information on metaphysical (spiritual, cosmology) information

Table 1: A matrix framework for recording Maori values information

systems that have traditionally stored and transferred knowledge and information in oral form, and where links to people, places and cultural activities are very important. Maori provide a number of examples of the ability of developing GIS in a culturally appropriate manner, consistent with traditional beliefs, customs and values.

The Cultural Dimension

Maori values are instruments through which the Maori people view/interpret/experience and, in general, make sense of the world. These values manifest themselves in many forms in the natural world, and can be conceptualized as areas, places, sites, attributes, features and items, both tangible and intangible. Maori values can be described as historic, cultural, spiritual and biophysical. Often, as attributes of land, water, and culture, they can be represented or expressed in a spatial or geographic context.

Maori Values Classification

Landcare Research New Zealand Ltd is presently working with a number of Maori organizations to develop classification systems and frameworks that describe and organize various types

and forms of Maori values information for storage and analysis using GIS tools. Methods are being developed to take into account traditional Maori beliefs, information sensitivity as well as confidentiality. Before entering data into a GIS, information is organized into eight main groups (1-8) from the general classification shown in Table 1. Based on these main groups, a more detailed Maori values classification has been developed to include:

- historic places and tribal landmarks
- ancestral sites
- archaeological sites
- sacred sites
- indigenous place names
- biophysical resources (landforms, soils, vegetation types etc)

- biodiversity (remnant indigenous forest, ecological systems)
- traditional food gathering sites
- special plants for weaving and medicines

GIS and Maori Values

The most important factors to be considered when storing indigenous information in a GIS are: resolution (ie different levels of detail); sensitivity of information (ie confidential and/or information requiring in-depth cultural understanding); and cultural and intellectual property rights (ie ownership or privacy rights to be attached to each piece of information). These factors will affect the type and form of the information that can be stored, analyzed and displayed by a GIS.

To satisfy these requirements, all the classified information is organized within the matrix framework shown in Table 1. From top to bot-

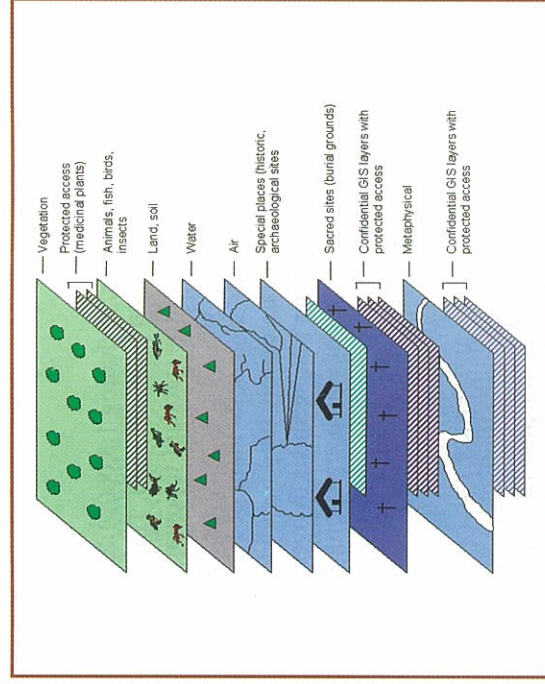


Figure 1: Factors related to Maori values are stored in layers

tom (1–8) the information becomes progressively more sensitive, while from left to right (a–d) the information becomes more detailed, confidential and personal, with property rights and access to information becoming more important. GIS database structures have been specially designed to accommodate information at national, regional, local and individual levels. This structure provides links between information at the national level, which is likely to be more general and accessible in the public domain; and information accessible at the local level, which is likely to be more detailed and confidential, requiring some form of restricted or protected access.

Each piece of information recorded is referenced to a source or several sources, whether it be a person (Maori elder), book, archive or map, and references are coded appropriately for database entry.

Once organized, referenced and entered into the GIS, the information can be spatially represented as a series of GIS layers (Figure 1). Each layer has different levels of detail, sensitivity and confidentiality which all determine the degree of restricted access at each level.

Sensitive Information

Information that is too sensitive or confidential to store in a GIS is linked via a database directory to an individual person. This allows for additional information to be obtained from an

alternative knowledge source. Some options are:

- recording the information as silent or concealed files, linked to a GIS database or a map;
- recording the information as an overlay, such as a grid network, which does not identify the actual position or location of restricted or sensitive information such as sacred sites; and
- setting up a directory, which can direct the inquirer, via a Maori organization such as a Maori tribal organization, to an individual (ie a Maori elder), for answers to particular questions.

By following these options, highly sensitive or confidential information can be displayed as a label on a map, or simply 'flagged' in the GIS as a sensitive or restricted area, directing the inquirer to another information source (Figure 2).

Database Structure and Cultural Sensitivity

Although the methods outlined in this article are still experimental, they provide insight into what is required to develop culturally appropriate GIS tools, and demonstrate the need to take into account both the sensitivity and the confidentiality of the information. These factors determine the final nature and form of the structure of the GIS database and are relevant wherever property rights and confidentiality of data is a primary concern. ④

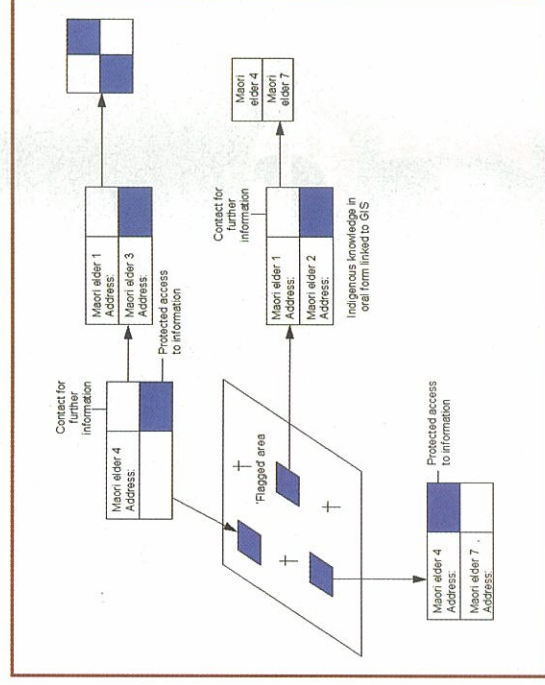


Figure 2: Sensitive or restricted areas are easily labeled