

**Presenters' bio and outline for the
Māori GIS conference, Holiday Inn on Avon, Ōtautahi, May 13-15 2009
“Protect and Progress what you value”**

Amanda Symon, Ngai Tahu Rock Art Trust, Dunedin. *Amanda Symon works as Curator for the Ngai Tahu Maori Rock Art Trust, a charitable organization that supports Runanga in the management, protection and conservation of the 550+ Maori rock art sites within the rohe of Ngai Tahu Whanui. The Trust also manages the South Island Maori Rock Art Project (SIMRAP) a long term rock art survey and recording project initiated in the 1990s and still active today.*

Taonga Analysis: *This presentation focuses on the Trust's efforts to develop a digital data storage and management system for the information generated by the SIMRAP. The data to be managed comes in a variety of formats: digital and film based photography, site mapping data, topographic and cadastral maps, archival documents, details of site threats and current protection mechanisms, and sketches and descriptions of the images themselves. Changes in the methodology and equipment utilized by SIMRAP over the length of the project also need to be reflected, as do multiple visits to the rock art sites. From the perspective of the Trust the system used to store this information must also support and enable practical site management, have multiple levels of access, and facilitate the development of new research.*

Bernadette Papa, Ngati Whatua ki Orakei, Tamaki Makaurau, Bernadette Papa, BA Hons (Geography), Orakei, Tamaki Makaurau-Auckland. *In 1995, Bernadette enrolled in two 26 week (TOPS) courses in Maori Weaving and went on to a year long course the following year, at Pukenga, Unitec, Owairaka. Under the tutelage of Kahutoi Te Kanawa they studied many facets of raranga-whatu over the two years she attended there. Bernadette commenced her Arts degree as a pioneer (student) of the summer school programme at the University of Auckland in 1999. As an undergraduate, she double-majored in Maori Studies & Geography and found the environmental fields in geography*

complemented the conservation concerns for resources she developed as a weaver. In her post-graduate year (2003), Bernadette used GIS to analyse and display Kauri Tree Ring data to develop a picture of past climate in Aotearoa. Bernadette has been working as a full-time consultant on RMA (and HSNO) issues for Ngati Whatua o Orakei's Heritage and Resource Management Unit since 2003.

Mapping sites of significance for inclusion into the District Plan, *A review of Auckland City Council's District Plan in 2009 has provided an opportunity for Ngati Whatua o Orakei (NWoO) to identify a number of sites for scheduling consideration. Currently there are only 8 Maori Heritage Sites registered in the Isthmus DP. This project identifies 'Tekau-ma-rima' (15) sites for scheduling. Another 30 sites have also been identified for further investigation and scheduling consideration. This project provided the ideal opportunity for NWoO to utilise and build a GIS to capture, simplify access and manage cultural heritage information about significant sites. Empowering current and future NWoO kaitiaki is a key objective of the project. The GIS is expected to enhance our ability to respond resource management matters in Auckland City. Part of the research process included two days in the National Archives (Wellington) and interviews with a variety of local 'experts' (i.e. kuia/kaumatua, historians, caving enthusiasts, long time residents, etc). The resulting dataset is a point data set overlaid on a medium resolution aerial of the Tamaki-Auckland Isthmus with hyperlinks to source information (scanned and collated as pdf files) held on my hard-drive database, and/or weblinks to existing information (i.e. Waitangi Tribunal reports). Our digital database is not externally accessible at present and measures to manage copyright and/or intellectual property issues have been proposed. The database is intended as a framework that can be modified or updated as necessary and is intended to be available for the use of hapu members in the future.*

Bev Hughes, *Ngāti Awa, Whakatane, Ngati Awa, Bev is the Manager for Environment Ngati Awa. She holds a Bachelor of Social Sciences Degree (first Class Honours) majoring in Resource and Environmental Planning conferred by the University of Waikato. Bev has a wide range of experience from her former roles as Manager Ngāti Awa Research & Archives during the Ngāti Awa Settlement Claim, Resource Planner in the Strategic Policy and Evaluation Section with the Bay of Plenty Regional Council, a position held for eight years during which time she developed Māori heritage Criteria in the Bay of Plenty Regional Policy Statement, developed the Ohiwa Harbour Strategy and a pan-tribal iwi planning document for the Ohiwa Harbour. Bev has held her position with Te Runanga o Ngati Awa for a period of four years during which time she has established and managed their environmental arm which is responsible for giving effect to Ngati Awa statutory*

acknowledgements and managing all environmental issues relevant to the Ngāti Awa rohe. Environment Ngāti Awa functions include the processing of resource consents, preparation of Ngāti Awa resource management plans and strategies, preparation of responses and submissions to statutory plans including national policy statements and legislative change, relationships management, and mauri enhancement projects. Bev is a Trustee for Putauaki Farm Trust, Ihukatia Trust (a subdivision in Ohope) and Ngakauroa Farm Trust in Te Teko.

***Ngati Awa GIS**, The GIS Database Presentation will include: a demonstration of the database and the layers it contains, identification of contributors of data, accuracy, information relating to its development (and costs), usefulness in RMA context, i.e. consenting, planning, digital 'site visits', usefulness as a 'diligence' testing database to check details of land Ngati Awa might consider purchasing, references to database maker*

***Craig Pauling**, Te Runanga o Ngai Tahu. Craig is a descendant of Ngai Tahu tīpuna Te Ruahikihiki (nō Taumutu), Tūrakautahi (nō Kaiapoi) and Te Rakiwhakaputa (nō Rāpaki) and also has Kāti Mamoe, Waitaha, Ngāti Mutunga, English and Scottish ancestry. Craig is passionate about the protection, monitoring, and enhancement of native flora and fauna, particularly as it relates to Ngāi Tahu mahinga kai species and practices, and is also heavily involved in Ngāi Tahu based environmental education initiatives including Aoraki Bound and Te Tira Horomaka. Craig shares his time between looking after his three tamariki, Mihiroa, Meihana and Tainui and working part time work as an Environmental Advisor for Toitū Te Whenua (the environmental management unit of Te Rūnanga o Ngāi Tahu), lecturing in Māori environmental management at Lincoln University and studying towards his Masters degree in Applied Science. Craig has worked for Te Rūnanga since 1999, after graduating from Lincoln University with a Bachelor of Resource Studies. He lives in Ōtautahi with his children and partner Janyne who is from Arahura on Te Tai o Poutini.*

***State of the Takiwā:** Using GIS to communicate the cultural health of waterways, In 2007, over 100 freshwater sites from over 20 catchments throughout the South Island were assessed using the Takiwā tool, to test and refine the method for wider application, and to develop a report on the health of freshwater resources of Te Waipounamu from a Ngāi Tahu perspective. GIS was used to help map the results of this study and visually communicate the cultural health of South Island waterways. Together, the Takiwā tool and GIS provide potential for understanding and reporting on the cultural health of the environment.*

David Swann, Eagle Technologies, Auckland, Educated at the University of Wales and the Royal Military Academy Sandhurst, David Swann served for 12 years with the British Army, rising to the rank of Major. The majority of this service was with the United Kingdom Military Survey. David started worked for Environmental Systems Research Institute (ESRI) from 1997-2008 as a Director of Business Development. In 2008, the Swann family moved to New Zealand where David now heads up Eagle Technology's GIS Business Unit. David has travelled the world giving seminars on the applications of GIS. He has contributed chapters to definitive text books on GIS (GIS – Principles, Techniques, Management & Applications (Longley PA, Goodchild MF, Maguire DJ, Rhind DW; Wiley; 1999) and Remote Sensing for GIS Managers (Stan Aranoff; ESRI Press; 2005) and written many articles for GIS publications.

Enterprise GIS – Enabling Indigenous Populations around the World', Establishing an information framework for land rights, Communicating land rights, Understanding and protecting cultural heritage, Understanding current and future value of land

Dean Walker, Tiakina, Nelson, Ngati Pakeha, Dean works as a resource management advisor to Tiakina te Taiao (an iwi resource management entity in Te Tau Ihu) running their GIS and research programme. In this role Dean has built Tiakina's GIS including mapping of cultural sites. Dean has also worked for Tainui Taranaki ki te Tonga on their sites of significance project as part of their Treaty of Waitangi Claims.

Using GIS in Tiakina te Taiao's Environmental Indicators Programme, Over the last 5 years Tiakina has developed a cultural health index for monitoring the environmental and cultural health in the Motueka and Riwaka catchments. The information gathered has been integrated into our GIS and currently we are developing a system to give effect to our findings and concerns.

Des Kahotea, Orcon, Tauranga, Tauranga Moana, Dr Des Kahotea hails from Tauranga Moana iwi and has recently conducted research on defining Maori and ancestral landscapes for heritage management purposes, which he is slowly writing up. Funding came from a Nga Pae O Te Maramatanga post-doc fellowship

Using GPS survey and GIS maps for the heritage management of archaeological sites for protection and preservation, During 1994 I began the challenge to the wholesale destruction of waahi tupuna undertaken by developers and sanctioned by New Zealand Historic Places Trust as the statutory body for the Historic Places Act 1993 at Papamoa. In 1996 I was able to undertake a GPS based archaeological site survey of residential and future urban zones of the Papamoa area, which was sponsored by NZHPT and Tauranga District Council. This would have been the first such undertaking of the use of GPS on this scale. The objective was the use of GPS survey and GIS maps for the heritage management of archaeological sites for protection and preservation. This was not achieved and this presentation will discuss why.

Garry Christoffersen, Boffa Miskell Limited (BML), Tauranga. Garry is part of the Digital Environment Services team (CAD, GIS, and visualisation) of Boffa Miskell Limited, an Environmental Planning Company, that includes cultural advisory. Garry has worked in GIS for about 15 years, in both the public and private sector, as well as having his own business for three years. He has undertaken a diverse range of projects including implementing GIS, structuring data, asset management systems, GIS reviews and of course making maps. Over the last five years Garry has worked with Tangata Whenua in Tauranga Moana and the Central Plateau in projects such as sites of significance and to support Waitangi Tribunal claims.

Mapping is important, but it is only part of the solution. The purpose of this presentation will be to get the audience thinking about GIS more than just "dots on maps". GIS is only an implementing tool, the real usefulness is in the systems, processes and information associated with the "dots on the maps" and how that information is shared with the wider community.

Historically cultural information is not well managed and in numerous instances has to be recreated. There is a lack of standard approaches for structuring data and implementation is undertaken at a local context, rather than a national scale. We need to learn from the experience of organisations who have been using GIS for the last 10 years and how it can be done better. We need to use maps to better engage with the community and implement easy to use systems that others can contribute information and knowledge about the places we live or have lived. We need to spend the majority of money on physical projects that make a difference to our environment and peoples lives, not on recreating the wheel.

Garth Harmsworth and Chris McDowall, Manaaki Whenua, Palmerston North, Te Arawa, Ngāti Tūwharetoa, Ngāti Raukawa, Tuhourangi, Garth Harmsworth (Te Arawa, Ngāti Tūwharetoa, Ngāti Raukawa, Tuhourangi) is a senior environmental scientist based in Palmerston North and has worked for Landcare Research since 1992. His career spans over 24 years in resource management, land resource assessment, national environmental databases, GIS applications, and indigenous research. Examples of Garth's research can be found at http://www.landcareresearch.co.nz/research/sustainablesoc/social/indigenous_index.asp. Chris McDowall is an informatics researcher working at Landcare Research's Palmerston North office. He develops tools to help scientists analyse, visualise and communicate geographic information.

Participatory and interactive visualisation tools for Māori futures, Māori are continually developing, using and refining technology and tools for their own use and applications, including GIS and integrated knowledge/information systems. We have moved a long way in the last two decades. The culture is now driving and determining the nature of the global technology. Many Māori organisations and groups have carried out strategic planning and development exercises and defined aspirations. They require tools that can help visualise and plan initiatives, aspirations, and identify various scenarios and pathways – from a Maori world view – for achieving specific goals across, cultural, environmental, economic, social and political dimensions. Tools should therefore help capture, articulate and communicate these goals and aspirations to underpin effective decision-making. The desire is to have tools that are participatory, accessible, and interactive. There are a growing number of tools and frameworks that enable people to record, visualise and share geographic information over the internet. Over the past year, Manaaki Whenua has customised a range of web-mapping technologies, including Google Maps and Google Earth, to communicate scientific and cultural knowledge about landscapes with our partners and clients. In this talk we will review a series of case studies and provide an account of the lessons we have learnt so far.

Gerard O'Regan, Auckland, Ngai Tahu, Over the last two decades Gerard has been passionately engaged at marae, iwi and national levels in the management of New Zealand's heritage. This has included museum positions, professional bodies, private practice and as Heritage Manager for Ngai Tahu. He recently completed a Master of Arts in archaeology studying Maori concepts of tapu in relation to rock art sites, and is about to further pursue his rock art interests through doctoral study at the University of Auckland. Gerard is a trustee of the Ngai

Tahu Maori Rock Art Trust and a ministerial appointee to the Maori Heritage Council of the New Zealand Historic Places Trust Te Pouhere Taonga.,

Taonga Pounamu: An experiment in researching Maori artefacts with GIS, Beyond helping to manage and catalogue taonga Maori, GIS invites a whole new generation of research questions exploring the significant collections that have been accumulated in New Zealand's museums. This presentation will share the results of a simple study of the distribution of pounamu artefacts in the South Island where the variable distances between pounamu sources and artefact findspots were investigated using GIS. The study serves to highlight some of the issues to be addressed and the kinds of developments that are required to unlock the future potential of GIS and our museum collections.

Huia Pacey, Tuwharetoa, Ngāi Tahu, Te Tau Ihu. Huia has a grounded experience in tribal development through diverse roles such as Research and Administration manager for the Tuwharetoa ki Kawerau Raupatu Claim; as a Board member for Maori Investments Limited and as an advocate for Tuwharetoa ki te Taiao. She has a Graduate Diploma in Maori Studies (with distinction) and a Masters in Indigenous Planning and Development from Lincoln University and has even spent both a winter and summer internship looking at capacity building and water management with the International Indigenous Institute of Resource Management in Denver, Colorado. She is currently contracted to Te Rūnanga o Ngāi Tahu as the Environment Advisor – GIS and is a Trustee in several Ahuwhenua Trusts.

John Reid, Christchurch, Te Runanga o Ngai Tahu, John has a number of years experience in facilitating research and development in Maori communities. In particular his field of expertise is in the adoption and utilization of sustainable technologies that are in synergy with tikanga Maori. John completed his Ph.D. thesis on this theme in December 2007. Currently he is the Manger of Toitu Te Kāinga in Te Rūnanga o Ngāi Tahu where he is responsible for Rūnanga commercial development. In this role John manages a number of projects which cover the following areas of interest; sustainable food, fibre and energy production; pounamu industry development; boutique market development of iconic fisheries; Maori organic certification and branding for mahinga kai; Ngāi Tahu regional economic development; and Ngāi Tahu branding.,

Opportunities for development using GIS: *The presentation provides a snapshot of the way in which John has used GIS to good effect within two projects. The first project involved a process of prospecting for renewable wind energy generation potential on Maori land in the South Island. It will be demonstrated how map layering was used to identify blocks with desired attributes for wind-power generation. The second project used GIS analysis to determine the value of the pastoral farming resource on Maori land in the South Island, first through determining current land use and second estimating the stock-carrying capacity for each form of land use. The presentation concludes that GIS is a very effective tool to assist decision-making, however it cannot fully substitute for ‘on-ground’ knowledge and experience.*

Jon Proctor, Massey University, Muaupoko, *For the past 9 years Jon has worked for Rangitaane O Manawatu and Tanenuiarangi Manawatu Inc. developing and utilising GIS to provide advice in relation to fisheries, resource management, local government and environmental issues. Jon has also provided research and information to Rangitaane O Manawatu and Muaupoko on Treaty of Waitangi Claims with a large portion of that information being based on GIS analysis. He also works as a Research Officer at Massey University in a multidisciplinary team researching volcanic hazards and mass flows. Recently Jon has participated in GIS and Maori land research at Manaaki Whenua – Landcare Research. Jon is currently completing a PhD focusing on volcanic mass flow modelling and hazard map creation.*

Towards developing and applying an Iwi/Hapu based GIS system. *(J. Procter, G. Harmsworth, C. McDowell, H. Heke, J. Dymond, D. Harris.), Geographic Information Systems (GIS) provide an essential tool for Maori land organisations and Iwi organizations / authorities to merge traditional knowledge with present day business functions and future planning. Rangitaane O Manawatu and its Iwi authority Tanenuiarangi Manawatu Inc. (TMI) first utilised GIS in the 1990’s primarily as a tool in response to Treaty of Waitangi Claims. In 2002 the GIS was expanded as a database and storage tool for spatially referenced cultural information or sites of significance gathered in response to Treaty of Waitangi Claims research. The data contained within the database was created, researched and documented from various historical records such as pioneering surveyors’ notebooks, Native Land Court Records, oral narratives and historical waiata. The information or site descriptions were matched to current topo-maps or present day aerial ortho-photos. In some cases historical maps were scanned and rectified (NZMG, GD1949). The points noted on the rectified historical maps were digitized and added as significant sites to the GIS. To date there are approximately 700 sites with 100 that are unable to be located. The sites range*

from areas of settlement, Pa, Kainga, etc, to sites where natural resources were gathered, cultivation areas, Karaka groves, Kiore ara etc, and sites of ecological importance such as dunes, lagoons, rivers and peaks. GIS (ESRI, ArcGIS; shapefiles) sites of significance were able to be analyzed and queried with other databases allowing Rangitaane O Manawatu to correlate their culturally and historically significant sites with current environmental datasets. GIS databases are now used in a variety of business functions to enforce and recognise the importance of Maori concepts in relation to land management and environmental legislation. In a second case study the Maori land block, the Aohanga Corporation, required similar methods to be applied to create a dataset of culturally significant sites. However, to encourage interaction with shareholders web-based methods to display the data were developed. In conjunction with this was a requirement to develop a single layer or raster image describing the cultural significance of the entire land block primarily as a tool that could be applied in land management and environmental modeling. This layer provides one method to partly fulfill a structure as envisaged by Harmsworth (1998).

Kath Henderson, Crown Forestry Rental Trust, Wellington, Originally from Aberdeen in Scotland, Kath studied GIS at Masters level at Nottingham University and fled the UK as soon as she graduated! Kath has been here in NZ ever since, and in that time has worked in GIS across a wide variety of industries, including telecommunications, environmental conservation, GIS consultancies and now the treaty sector. That totals 12 years experience, and Kath has come to thinking she needs a break, so she's off to do some travelling very soon for the rest of 2009. Her current role as the Mapping Facilitator at Crown Forestry Rental Trust is a fascinating and dynamic job, one she hopes to return to early next year

Crown Forestry Rental Trust GIS. Kath will talk about the role of Crown Forestry Rental Trust (CFRT) and GIS at CFRT providing insights from the funding side of the treaty sector. Kath will also talk about some of the issues she has come across with GIS in the treaty sector including, capturing the knowledge, representing boundaries, intellectual property, as well as understanding the potential of GIS and spatial data management. Kath will also explore some ideas about where GIS is going, both within Maori and the treaty sector.

Nathan Kennedy, Ngati Whanaunga/International Global Change Institute, University of Waikato, Hamilton, Ngati Whanaunga, Ko Moehau te Maunga, Tikapa te Moana, Hauraki te Whenua, Marutuahu te Tangata. Ko Nathan Kennedy taku ingoa, Ngāti Whanaunga tōku

iwi, Ngāti Karaua tōku hapū, No Waihi āhau. Kia ora koutou. I am an Environment Officer for my iwi, acting in a voluntary capacity. My paid job is as a research officer at the International Global Chang Institute – Waikato University, where for the past 5 years I have worked on the FRST funded PUCM (Planning Under a Cooperative Mandate) research project. PUCM is investigating the environmental outcomes of council planning in Aotearoa. My team has considered council performance from a Māori perspective, and developed a kaupapa Māori environmental outcomes and indicators model. My GIS background began at Waikato as a graduate geographer, followed by: A brief period with Terralink NZ, Hamilton – digitising Pacific Island topographic features from aerial photography; Geographic Technologies in Auckland – general GIS mahi and developing grid based representation of Māori cultural value; GIS Administrator for Thames Coromandel District Council ; Various modelling, mapping and analysis for Te Rangahau o Ngāti Whanaunga and the Ngāti Whanaunga Environment Unit.

Cultural Mapping – Mapping tangata whenua values for inclusion in statutory planning documents. *Some councils have engaged tangata whenua to create cultural maps (and associated datasets) with the intention that these be included in RMA statutory plans. This presentation will draw on the experience of Te Rangahau o Ngāti Whanaunga in creating cultural maps under contract to Waikato Regional Council, and on the PUCM research into kaupapa Māori environmental outcomes and indicators. It will describe methods used, including: Extraction of ngā korero o ngā tupuna from early block survey plans; Collection from tribal knowledge holders, digitisation, and representation of mātauranga Māori; Mapping Māori environmental outcomes and indicators; Interpretation of cultural knowledge with other contemporary datasets. I will further explore issues relating to the representation of culturally significant knowledge including: The electronic representation and storage of mātauranga Māori and cultural knowledge; Protection of intellectual property within iwi / Crown (council) arrangements; Extracting benefits for tangata whenua from contemporary non Māori data and from utilising statutory instruments to articulate iwi perspectives*

Paul Langham, *Te Puni Kōkiri, Wellington, Paul Langham has been the Information Architect at Te Puni Kōkiri for the last 10 years. His history within the IT industry goes back nearly 40 years and has covered a very broad range of technologies in a variety of industries. Although the role in Te Puni Kōkiri covers all application software and databases he has a special interest in GIS applications.*

Te Puni Kōkiri GIS. *Te Puni Kōkiri was an early adopter of GIS on the Internet when it first developed the Māori Land information Base (MLIB) web site, in conjunction with the Māori Land Court. The presentation will cover the history of this development, its recent redevelopment, and where Te Puni Kōkiri is looking to extend this in the future. It is hoped that this session may be interactive and help shape the future of this capability to meet the needs of Māori nationally.*

Rama Ormsby, Tai Ranga Whenua (iwi group) Programme Manager, Environment Waikato

Tai Ranga Whenua GIS, Some of the mahi the Tai Ranga Whenua team has progressed in Environment Waikato

Raukawa Trust Board, *Raukawa Trust Board, Raukawa, The Raukawa Trust Board was established in 1987 to meet the dreams and aspirations of the people of Raukawa from its four pou whenua of, Te Kaokaoroa-o-Pātetere, Te Pae-o-Raukawa, Wharepuhunga and Maungatautari*

Raukawa Trust Board GIS. *The presentation will focus upon 3 key aspects, Where we were pre- GIS, Where we are now- since installation of GIS, Our aspirations for the future use of GIS*

Shaun Awatere, *Manaaki Whenua Landcare Research, Ngāti Porou, Dr. Shaun Awatere (Ngāti Porou) — Manaaki Whenua Landcare Research, Resource Economist, Shaun is a resource economist whose work involves allocating economic values for all kinds of services that do not have an identifiable “market” value. Natural environmental processes come into this category. His experience in GIS software applications consist of using predominantly ArcGIS software and spatial analyst extensions. Areas of expertise include land use assessment and database management.*

Mātauranga Māori — protocols and structures for database management. *Landcare Research developed a Māori cultural values database that provides a framework for the spatial description of ecological attributes based on a mātauranga Māori perspective of the environment. This database has been created using generally accessible database software (Microsoft Access) and has been designed*

to easily associate with Landcare's spatial classification of terrestrial environments database (Land Environments of New Zealand). The cultural values database was initially developed for bio-security research but it is hoped that it can be made available to the wider community, in particular Māori, as a tool for resource management. The presentation discusses the issues concerning Landcare Research's database for iwi and hapū, including: Database design and methods of deployment; Indigenous knowledge management; Iwi and hapū perspectives of integrating mātauranga Māori of the environment and database systems, and A case study highlighting how mātauranga Māori of the environment can be managed using spatial databases for the purpose of natural resource management planning. Seven in-depth interviews and one focus group session were completed during the timeframe. The participants consisted of people from the various iwi represented within the Tairāwhiti region including kaumatua and iwi researchers. A number of themes were identified in the analysis of the information gathered from the interviews that had implications for Landcare's database. These themes focused around the locality of indigenous knowledge, the use of indigenous knowledge for educational purposes, and the exploitation of indigenous knowledge by non-indigenous groups. Participants from the interviews and focus group concluded that there is a need for an information management tool that recognises mātauranga Māori and that the role of iwi and hapū in the management of this information is essential. Active involvement of iwi and hapū in the management of their mātauranga helps develop their capacity to maintain and protect their tāonga tuku iho.

Steve Massey. Te Runanga o Ngai Tahu. Ngati Pakeha, Steve has a bachelors degree in economics, a masters degree in computer science, is part way through a master of business administration degree, is pursuing a credential with the New Zealand Project Management Institute, and is a member of the New Zealand Computer Society. Steve and his family emigrated to New Zealand from England at the end of 2001 and he spent the next 6 years at NIWA (The National Institute of Water and Atmospheric Research) making marine and freshwater environmental and biological data available to the public via the web, through interactive digital maps and enterprise-scale data warehouses. Ngāi Tahu has engaged Steve on a fixed-term basis to look after its customer relationship management system

Using Open source to implement interactive digital maps OBIS (Ocean Biogeographic Information System) demo, <http://obis.niwa.co.nz>; FBIS (Freshwater Biodata Information System) demo, <http://fbis.niwa.co.nz>; WQIS (Water Quality Information System) demo, <http://wqis.niwa.co.nz>; Architecture, Arc IMS, Arc SDE, IBM IDS, Java, Apache; Lessons learned, 180 degree line

problem, Eastings/northings and the Chatham Islands, GIS continuum with web maps at 1 end and sophisticated GIS at the other, Open layers and UMN map server, The GIS “iceberg” – don’t underestimate the data management and software development effort, The future; OGC and open source, Web Map Services

Takarei Norton, *Te Runanga o Ngāi Tahu. Te Tau Ihu, Takarei has whakapapa links to Te Tau Ihu and several Ngāi Tahu hapū but primarily Ngāti Kurī of Kaikōura and Ngāti Irakehu from Banks Peninsula. Takarei holds a Postgraduate Diploma and a Bachelor Degree in Parks, Recreation and Tourism Management, both from Lincoln University, and a Diploma in Māori Studies from Christchurch Polytechnic. Since 2001 Takarei has been employed by the Office of Te Rūnanga o Ngāi Tahu as an Environmental Advisor protecting areas of historical and cultural significance to Ngāi Tahu Whanui.*

Cultural Heritage mapping, *Since 2006 Toitū Te Whenua (Environmental Management Unit for Te Rūnanga o Ngāi Tahu) has been mapping cultural and historical sites on the Toitū Te Whenua Geographical Information System (GIS), primarily focusing on the South Island High Country and Kaikōura. This presentation outlines the work that Toitū Te Whenua has undertaken over the last few years and the work that Toitū Te Whenua proposes to undertake in the future in regards to this kaupapa.*

Tracey Tangihaere. *Ministry of Justice, Maori Land Court. Wellington. Tracey Tangihaere is the current Director of the Māori Land Court, leading and managing the Māori Land Court, Māori Appellate Court and Taiapure-Local Fisheries Tribunals. Commencing her role in November 2008, Tracey had previously spent three years with Tairāwhiti Polytechnic as Acting Chief Executive and Deputy Chief Executive. She was also the Chief Executive of Te Runanga-o-Turanganui-a-Kiwa for six years. Tracey has a Bachelor of Management Studies (1st class Honours) majoring in Strategic Management and Human Resource Management. She is currently studying towards a Master of Management Studies. Her interest in land is evident beyond her role as Māori Land Court Director, Tracey is also a practising Maori organic orchardist at her home in Manutuke (Gisborne). Her tribal affiliations are Ngaati Porou: Te Whanau a Ruataupare, Ngaati Hunaara, Whanau Takimoana, Te Whanau a Tuwhakairiora; Tanui: Ngaati Maniapoto, Ngati Rora, Ngaati Apakura, Ngaati Pou.*

I will provide an overview of the History and Purpose of the Maori Land Court, Land Tenure problems experienced by Maori Land Owners; Maori Landowners, current access to information and future problems accessing management information. Current GIS or spatial data available does not include Maori Freehold Land titles until LINZ transfer is complete by August 2010. Therefore some presentations or data sets for sale do not contain full picture of the remaining 6% of NZ's total Maori Land mass information. Te Kooti Whenua Maori has an interest in forecasting the future opportunities and challenges for small Maori land owners, would a GIS system be helpful, or are other solutions available in the market place? I am interested in feedback from other agencies on the phased approach that we present or indeed if any participants have any solutions for the problems of ascertaining decision making data sets for owners and the judiciary.