



Australian and New Zealand Map Society

MAPPING IN ACTION

National Library of Australia, Canberra

24-25 Sept. 2019

ABSTRACTS

TUES 24 SEPTEMBER

KEYNOTE

Martin Woods

ANZMapS/National Library of Australia

Maps societies and libraries in action: Past, present and future

The Australian & New Zealand Map Society (ANZMapS) was created from the merger in March 2009, of the Australian Map Circle (1973) and New Zealand Map Society (1977). It is 'dedicated to exploring and developing the world of maps.' ANZMapS has goals that are similar to those of the New Zealand Cartography Society and other map or cartography societies elsewhere, though the specifics of the Australian society are unique to this part of the world. I will be addressing some of the 'back story' of ANZMapS, particularly how it has changed from being an association of map curators and librarians mostly engaged in managing and cataloguing the content of 200 or more map libraries in the 1970s, and supporting this work, to a more broadly engaged interest group almost 50 years later. One of the constants has been its relationship to the National Library. How has the library and cartographic scene changed and what does this mean for societies like ANZMapS into the future? And as part of this question, how has the changing landscape of digital mapping, organisational and budgetary pressures in government, state and national libraries, and universities, affected how these societies operate and perform a useful role?

PACIFIC SESSION

*** = student presenter**

Hedvig Skirgård*

ANU

Mapping the Pacific - a Sea of Islands

The Pacific Ocean can easily be misunderstood as a vast empty space, a desert of water - islands thrown out in a far sea. This couldn't be further from the truth, the Pacific is an interconnected place - a Sea of Islands (Hau'ofa 1993). When we use maps in our research, education and public material - we should strive to use visualisations that best communicate our content. When representing the Pacific, this becomes particularly crucial because most of the available base maps do not adequately represent interconnectedness, which is often of great importance for research in history, linguistics, archaeology, and anthropology. I work on variation and history of languages in the Pacific, and together with ANU CartoGIS we created a set of maps that visualises the interconnectedness of the islands and communities of the Pacific before colonisation by white people. We used the principle of 100 mile overnight voyages from Marck (1986 & 2000) and consulted Pacific scholars and people from the Pacific to replace colonial names with Pasifika ones. The result is a series of maps that show different subregions of the Pacific, Exclusive Economic Zones and overnight voyage regions. Wherever it was possible, I chose place and language names that weren't in a European language, to better represent the region as it were prior to colonisation. The maps are available for free, including a basemap of overnight voyages. I hope that this material can improve the public's understanding of our neighbouring Sea of Islands and provide insight to scholars of the region.

Greg Lauer

Eastview Geospatial

Topographic Mapping in the South Pacific

This paper looks at this history of topographic map production in the South Pacific, starting with the colonial powers of the early 20th century, through to the current state of Topographic mapping in the region. In particular, we trace the role of the colonial and regional actors influence in the topographic mapping programs, especially through World War II and independence periods. We conclude with the current state of mapping in the region, and reflect on how the same colonial and regional actors are still influencing (and funding) most of the small Pacific Island states national topographic mapping programs.

ECOLOGY SESSION

*** = student presenter**

Micah Edwards* / Leah Arthur

Nowra Christian School

Optimizing nest box placement for Sugar Gliders

As teachers we are encouraged to teach students how to use new and emerging technologies. However, due to the rapid changes in technology, it is the problem solving and thinking processes associated with these technologies that is most important to teach school students. This project is an example of exploring the range of knowledge sources and thinking processes that go into an ecology project. Using community collected data and data from other sources, a map was created to show where sugar glider habitat had been marginalised, and where possible locations existed to place nest boxes for the purpose of keeping the sugar glider from extinction. The Atlas of Living Australia was used to map predator locations and information from Landcare was collated to create a map which showed the possible locations for sugar glider nest boxes. The competition was a very good experience for a young cartographer/geographer to learn about geospatial sciences and the geospatial trade.

Website:

<https://nowracs.maps.arcgis.com/apps/Cascade/index.html?appid=cefc3d5e56d8412e8e2129b5d24e37a1>

Percy Rakoto*

RMIT

Investigating the relationships between the spatial pattern of urban vegetation and Urban Heat Islands (UHI) in Melbourne.

Due to rapid urbanisation and increasing housing density creating larger heat storage in city centre, many cities around the world, such as Melbourne, feature regularly daily heat known as Urban Heat Island (UHI) in city areas compared to its suburbs. To help planners cooling the city considering the mitigation effect from urban vegetation, this research uses a set of spatial metrics including percentage of landscape (PLAND), edge density (ED) and patch density (PD) and Shannon's diversity index. It investigates the spatial correlations between urban vegetation and UHI effect. The metrics have been calculated using tile sampling method in FRAGSTAT of urban vegetation at 20cm horizontal resolution using Mesh Block as a spatial unit. The vegetation data has been classified into 5 classes: grass (0-0.5m), shrub (0.5-3m), small tree (3-10m), medium tree (10-15m), and large tree (15m+). LST data has been retrieved from Landsat 8 image captured in summer 2018 and using band 4, 5 and band 10. Geographic Weighted Regression was employed to investigate the relationship between UHI and the spatial pattern of urban vegetation. The results will answer the following questions. Where are the most vulnerable areas in UHI in Melbourne? How different vegetation configurations in diverse locations produce various cooling effects and have impacts on the local temperature? How various degrees of UHI could be solved by designing and planning a specific spatial pattern of urban vegetation using spatial metrics? The outcomes of this research will help planners define strategic locations and design shapes of the future greenspace in various locations in Melbourne.

Robert P Streit*

JCU

Custom maps reveal patchy feeding by fishes may leave coral reefs more vulnerable than previously thought

Coral reefs are being transformed by global climate change. Reef fishes that feed on algae can help to keep the system in balance, since they stop algae from growing uncontrolled and outcompeting corals. Many studies today assume that large numbers and a diverse mix of fishes will provide the most thorough removal of algae. However, to assess whether diverse fish communities really translate to an ecological insurance on the reef, it matters where these fishes feed. Unfortunately, we know remarkably little about where fishes feed, because of the logistic challenges of mapping large swaths of reef underwater and the difficulty in spatially tracking fish behaviour. In this study, we developed a novel approach using video tracking combined with modern photogrammetry methods to create large, high detail, underwater feeding maps. We found that most fish feeding is focused in only 14% of reef space with feeding areas showing remarkably little overlap. This means that the overall feeding impact that the reef receives is far more sparse than we previously thought. This is the first time we can assess this critical ecological function on coral reefs in a spatially explicit context, allowing new insights into the resilience of coral reefs.

SOCIO-ECOLOGY SESSION

*** = student presenter**

Mae Noble*

ANU

Using maps to balance social-ecological spatial priorities in Marine Protected Areas

Conserving the Australian marine environments using Marine Spatial Planning approaches presents many complex challenges for scientists and managers. Given that modern-day conservation is the art of balancing ecological requirements with human demands, I am exploring how to attain this balance by using fuzzy-set multi-criteria evaluation mapping and spatial modelling to understand the extent of stakeholder uses and priorities, and how this aligns with ecological processes in a Marine Protected Area on the New South Wales coast. During this talk, I will present some of the outcomes of my PhD. In particular, I will be able to demonstrate how my mapping outcomes and spatial models provide methods to interpret complex trade-offs and understand ways to support social-ecological resilience in our marine environments.

Kirrily Apthorp*

ANU

Seeing the forest for the trees: remapping primate conservation in Vietnam

Non-human primates are facing increasing threats around the world from human intervention through poaching, logging and clearing land for farms and development. As keystone species, non-human primates are critical to the biodiversity and health of their forests, making their conservation often synonymous with the conservation of the ecosystem they inhabit. Vietnam, home to over 25 species of primates, is facing particular threats to the future of its primates as human growth and rapid development regularly conflicts with efforts to protect primate populations and their habitats. With almost half of all primate species in Vietnam facing extinction, it has become increasingly important to understand their habitat and distributions. Yet, traditional in situ studies of primate habitats are often hampered by their small scale and suffer from an inability to situate the study site within the larger geographical landscape. In contrast, remote imaging analyses, while still new to the study of primatology, can fail to grasp the complexities of the small-scale fragments of the habitats remaining. Using a mixed methods approach of mapping and ecological sampling in addition to distribution modelling and interviews, this study explores the habitats of three geographically distinct Critically Endangered primates in Vietnam. Results have revealed insights into the potential distribution of these species and are helping to answer questions regarding their future conservation.

Melissa Pineda*

Swinburne

Mapping ecological injustice hotspots in cities

To identify and map environmental injustices, many innovative methods and tools have been developed. These tools have mainly focused on justice for humans due to cases of unequal distribution of environmental impacts. These tools, however, have not addressed issues of ecological justice or justice for nature. Ecological justice is an emerging field that argues for non-human agency, socioecological awareness, recognition of nonhuman capabilities, and participation in decision-making processes. Drawing from existing methods and tools, this paper's aim is to develop a novel methodology to define, identify and map ecological injustices in urban landscapes. This methodology operationalises the main dimensions of ecological justice, into a set of indicators that when mapped together reveal ecological injustice hotspots. To test its applicability, the urban region of Melbourne, which is has been undergoing intense urbanisation processes, is used as a case study. Context-specific indicators mapped in urban Melbourne reveal various degrees of ecological injustice hotspots. This methodology can be a systematic and effective way for urban planners and decision-makers to identify and target ecological injustice hotspots. This can also be an empowering tool for citizen scientists to provide input, recognise hotspots and collectively take informed actions that are driven by systematic, participatory, and inclusive processes.

Cynthia Parayiwa*

ANU

A spatiotemporal exploration of preterm and low birthweight incidence in Qld, Australia, 2007-16

There is ongoing interest in linking geographic and health data to better track outcomes and identify health disparity. Temporal analysis of geographical data allows for the tracking of location-based changes in community health and exploring potential drivers. Infants born prematurely (< 37 weeks gestation) or with a low birthweight of less than 2,500g face increased morbidity and mortality risks. This study will explore incidences of preterm and low birthweight births across the state of Queensland over time. Geographic Information System (GIS) software will be used to spatiotemporally analyse small area perinatal health data, collected under the Queensland Perinatal Data Collection from July 2007 to December 2016, to identify significant spatial clusters of preterm and low birthweight births and track trends over time. Changes in the definition of spatial boundaries, the collection of administrative data and the makeup of a population can complicate the analysis of historical small area health trends. However, such complexities do not negate the importance of geographical analysis of health data which allows for the effective monitoring of community level health outcomes, the identification and investigation of health hazards and the development of policies and plans that support individual and community health efforts.

SOCIO-HISTORICAL SESSION

*** = student presenter**

Nick Skopal*

ANU

Mapping megalithic jar sites in the Lao People's Democratic Republic

Xieng Khouang and neighbouring provinces in Central Lao People's Democratic Republic (PDR) are home to a vast megalithic landscape featuring large stone jars, discs, apparent lids and imported boulders located in elevated positions. Generally referred to as the Plain of Jars, although more recently as the Xieng Khouang culture, sites were first noted in the late 19th century, with excavations and site surveys commencing in the 1930s. Despite subsequent survey efforts and more recent excavations, our understanding of the geographic extent of the jar sites and the culture that created them remains limited. Through my PhD, I aim to address this knowledge gap by mapping and analysing jar sites, with a focus on the relationship between the sites and the associated landscape features. In this presentation I will discuss the results of an initial survey, conducted across 28 sites in early 2019, which constitute an important advancement in our understanding of the extent of jar sites. I will then outline the next steps I will take to analyse the landscape features associated with the jars, patterns evident in these associations, and the spatial distribution of sites. Finally, I will discuss the opportunities for further survey I am exploring.

Yu Lee AN*

ANU

Mapping the British Music Trade from Georgian to the Victorian era

Location is an essential key factor in the study of trade and mercantile history. That the success of a retail business depends on the accessibility to the highest number of potential customers is hardly a new idea. Its importance is demonstrated by the geographical clustering of similar businesses. The practice dates to the medieval era and has persisted to the present day. It has been a notable characteristic of mercantile cities and was well established before the industrialisation. The topic of this paper addresses the geography of British Music Trade and traces its movement across time and space. This paper aims to show that the expansion of the music trade corresponded to the urban and industrial developments and reflected economic and the population growth across Britain through visualisation in ArcMap. It looks at the city of London (the square-mile) and its surrounding areas, namely the West End, and the historic county of Middlesex that showed the highest concentration of the music trade through the period concerned in this study. It also tackles the issue of representing time in GIS through spatial-temporal visualisation. The geography of the music trade will be of interest to those who are interested in the geography of the past and the historical GIS.

Alan Mawer

Treasured Islands: Charting the Imagination.

The paper will review the part played by maps in locating and organizing the narratives of classics like Treasure Island, Peter Pan and Swallows and Amazons.

KEYNOTE**Igor Drecki**

NZ Cartographic Society/Auckland University

Beyond the Vote: ANZMapS' Affiliate Membership of the International Cartographic Association (ICA)

At the 18th General Assembly of the International Cartographic Association (ICA) held in July 2019 in Tokyo (Japan), the Australian and New Zealand Map Society (ANZMapS) was voted in as an affiliate member of the ICA. Months of discussions, planning, application writing and seeking endorsements finally came to fruition. At the same time, ANZMapS made history by becoming the first affiliate member that operates on equal terms in more than one country, i.e. in Australia and New Zealand. This talk traces the history of ICA affiliate membership and the idea behind its creation. It reports on the difficulties of establishing what organisation(s) became the first affiliate member(s) of the ICA. It reflects on the dynamic growth of affiliate members between late 1980s and now. Furthermore, a detailed look at the ICA Statutes and By-laws is offered highlighting various rights and obligations attached to affiliate membership. A point is made that affiliate members can play an active role in the running of the Association and take full advantage of various instruments made available by the ICA, including access to ICA News and the ICA website. The address concludes by examining what it really means, in practical terms, to be an affiliate member of the ICA. The dynamic growth of this type of membership proves that the appeal of becoming an ICA affiliate member has not diminished. But is it because of the rights, obligations or entitlements mentioned in the ICA Statutes that the ICA enjoys such an uptake, or is it as a result of something else? Finally, what sort of role ANZMapS wants to assume as the newest member of the ICA family?

CARTOGRAPHIC SESSION

*** = student presenter**

Oscar So*

RMIT

Landform perception accuracy in shaded relief maps among map readers who grew up in Victoria

Many modern maps include orthophoto imagery as a basemap. Orthophotos can help map readers to orient themselves in the terrain by showing major landforms, especially in non-urban environments. However, some orthophotos induce a perceptual illusion among some map readers wherein terrain features appear to be inverted: peaks appear as valleys and vice versa. Importantly, while this effect can be avoided when cartographers create shaded relief maps from digital elevation models, it cannot be removed from orthophotos, so it is important to understand in which contexts and for whom it is likely to occur.

Previous research has demonstrated that this illusion occurs in orthophotos taken from particular camera angles with generally low prevalence of the illusion, when the camera is positioned in the NW quadrant with respect to the terrain. However, participants in this research lived in the northern hemisphere. Other research has hinted that latitude differences responsible for different sun-terrain angles might be associated with differing prevalence of seeing the illusion, ostensibly because the same objects at different latitudes cast different shadows. Thus, our research replicated this study in a southern hemisphere population, participants who grew up in Victoria. We will report the results of this experiment in our presentation.

Leigh Mills

Geoscience Australia

Unlocking Geoscience Australia's Aerial Photography Collection

Prior to the advent of satellite imagery in the 1970s, extensive use was made of aerial photography (AP) to systematically image and capture land information. Geoscience Australia (GA) is custodian of some 1.2 million aerial photos, some dating back as far as 1928. GA is progressively moving the aerial photography collection from analogue to a modern digital data management framework to improve discoverability and access to the collection. Discoverability and access to data are essential to realising the full potential of the collection, and associated flight line diagrams (FLDs) are critical in connecting physical and digitised material in the collection to an accurate location. The focus of digitisation has been on scanning film (currently only 20% of collection) and storing individual frames as photo images. FLDs are also being digitised and georeferenced, and information on the film is transcribed into a relational database, which will drive a future interface and catalogue for open online access. GA also is implementing a new processing workflow to value-add to the digitised collection by creating products that are readily consumable into geographic information systems. This presentation will outline the process undertaken, the type of data available and example use-cases.

INDIGENOUS SESSION

*** = student presenter**

Inge Riebe*

ANU

Space becomes Place: One Kalam's Maps

This paper is based on my field work among the Kalam of the Bismarck Schraeder Ranges in Papua New Guinea from 1965-1979 and subsequent work with Kalam artist Manfred Wkeng Aseng including in 2019. It considers the intent of some of the first maps of the Kalam area made by Patrol Officers in the 1950s and by ethnographers in the 1960s, including my own in 1965. These are contrasted with those of Manfred Wkeng's drawings that are representations of place and reflect his intent, cultural practice and experience of place. The drawings together with his verbal descriptions unpack the complex interaction between the physical, human and spiritual environment he is depicting. Other maps created by Manfred Wkeng were created in dialogue with me, thus blending his subjective experience with the spatial knowledge I am asking about. I explore this privileging of an egocentric approach of the 'papa belong graun's' [Indigenous land owner's] subjective experience in the context of the understanding of maps as 'laden with latent meanings reflecting the predispositions and intent of their creators and the spaces they are intended to represent' [Harris] and in relation to the development of deep mapping.

David Nash

ANU

Mapping linguistic properties of Indigenous placenames

The International Year of Indigenous Languages (IY2019) intersects with mapping in placenames of indigenous origin. The geographic distribution of various properties of Australian Indigenous placenames is one of many indicators of Australian Indigenous territoriality (Nash & Simpson 2012). Some placenames can be assigned to a particular language by its phonotactic properties (Donaldson 2009 [2002]); others show language affiliation by the use of a particular suffix.

The 20th century 'Aboriginal naming' booklets have muddied perception of language areas, but the effects can be unravelled to an extent; see for instance the study of Akuna ~ Akoona (ultimately from the Diyari language of the Lake Eyre region) (Nash 2014b). With current digital tools it is straightforward to visualise distribution of particular suffixes by mapping. An example is the Wiradjuri suffix -DHura(y) in NSW (Nash 2014a). The presentation will show the results of the technique on placenames with -bri (such as Narrabri) and -bone (such as Quambone).

I conclude with suggestions for those who maintain official gazetteers. Useful additions would be an indication for each placename whether it is of Indigenous origin; the date of its first appearance on official maps (such as cadastral maps); and an indication of the distinction between of the feature type part of a name and the name's base.

Bill Arthur

ANU

Macquarie Atlas of Indigenous Australia

The aims of the Macquarie Atlas of Indigenous Australia are to introduce a new window on Indigenous life through the principal device of national maps and to make accessible to the general public, high school and college students data normally locked away in academic and government publications. The atlas comprises some 285 maps and graphs, 195 illustrations and explanatory text. These are arranged into 21 thematic chapters under more than 30 authors all expert in their fields. The first edition of the atlas came out in 2005, receiving the 2006 Award for Excellence in Educational Publishing. A second edition has just been released. In this presentation I will explain the genesis of the Atlas, its development to a second edition and our plans for the future; these include a junior edition and an interactive version. Items I will cover include: the structure, authorship, design and production of the maps, selection of the illustrations and the style and tone of the text. An additional purpose of this presentation is to make contact with others involved in the production of maps and atlases, with a view to exploring potential collaborations.

HISTORICAL SESSION

Margaret Cameron

The Juxtaposition of Two Inlets: Captain Cook's ploys to Keep out the French

When the naturalist, François Péron, saw Botany Bay in 1802, he reported to General Decaen, the French governor of Mauritius: "Even though in Europe these settlements go by the name of the colony of Botany Bay, there is no settlement in Botany Bay itself, where the land is damp, marshy and infertile, the climate is unhealthy, and there is no suitable or safe anchorage for ships. Port Jackson, which is about thirteen leagues north of Botany Bay, is undeniably one of the finest harbours in the world." Yet 32 years earlier, this shallow and unpromising place was the only inlet Captain Cook entered on Australia's temperate coast. Was Cook guilty of dereliction of duty in failing to seek out a useful port of shelter and refreshment on a new coast? Or had he found all he was looking for while the Endeavour and her crew were tied up in Botany Bay? This presentation examines the documentary and other evidence showing that Cook discovered, then concealed, the main body of Sydney Harbour.

Robert J. King

Gerard Mercator's Pulo Condor

Mercator's globe of 1541 showed a couple of small islands, Pullo candor. These were the islands Marco Polo called Sandur and Candur. They were the Pulo Condor islands, or Côn Đảo, an archipelago of sixteen mountainous islands and islets, situated about 185 km from Vũng Tàu and 230 km from Saigon: in former times they were an important stage in the navigation between China and Southeast Asia. They can be identified with Claudius Ptolemy's Satyrirorum insulae (Isles of the Satyrs), a name probably drawn from the macaques endemic to the islands. On the same globe, Mercator showed the Satyrirorum insulae further to the east of Pullo candor, in the Sinus Magnus. On his world map of 1569, Mercator placed Pulocondor correctly off the coast of Camboya (Cambodia) but relocated the Insulae Satyrorum to a position between northern Japan and the mainland of China. His treatment of the Pulo Condor islands illustrates how sixteenth century cosmographers and cartographers could place the same island or lands, under variant or different names, in more than one location on their maps and globes, in accordance with the fragmentary and sometimes contradictory information available to them, in accordance with prevailing cosmographic principles and theory.

Trevor Lipscombe

Australian Hydrographic Society

Lt James Cook's misplaced landmarks on the coasts of Victoria and NSW

Lt Cook named 28 land features on the coasts of Victoria and NSW in 1770. Recent published research has shown that six of these are in the wrong place on today's maps, and three others are correctly sited but believed by some to be elsewhere. Now for the first time in 250 years we have an accurate public record of what Cook actually saw and named on these coasts. This presentation will examine how some of these errors occurred and have been perpetuated. It will also raise the question: Given such a high error rate, how many other places named by maritime explorers are not where they should be on today's maps?