RIGHTS IN GEOSPATIAL INFORMATION: A SHIFTING LEGAL TERRAIN

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The growing significance of 'big data' raises new issues for copyright law, not least when the data is presented visually or graphically to generate new and useful information and insights. One such example is the case of digital maps. Maps and written descriptions of geographic information have long presented challenges for the law of copyright, most particularly because they are perceived as factual compilations. The appearance of maps, and the information they contain, has changed considerably over time. However, the last few years has seen an extraordinary transformation in the methods and practices of collecting, storing, representing and disseminating geospatial data and information. This article considers how copyright law applied in the analogue era to regulate the production and dissemination of geographic information, the effects of new technologies and digitisation on how law applies to geospatial data and associated products and systems, and whether either a database right or some other form of protection is required.

CONTENTS

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I Introduction

Australia lies on the fastest-moving tectonic plate on Earth, floating northeast at a rate of about seven centimetres a year.[1] This means that geodesists are faced with the continuing challenge of keeping the coordinates of maps up to date.[2] The appearance of maps, and the information contained therein, has changed over time, influenced by the particular purposes they are designed to serve, developments in adjacent technological and scientific fields, as well as cultural, economic and ideological factors. Until recently, these changes have occurred at rather the same pace as continental drift: slowly and perhaps, to the majority of people, imperceptibly. However, the last few decades have seen extraordinary transformations in the methods and practices of collecting, storing, using, representing and disseminating what was once called geographic information but is now more broadly termed 'spatial data'. Updating Australia's datum so that it reflects a position on the face of the globe that matches satellite positioning systems is an essential step towards modernising Australia's spatial data management. What makes it essential is the centrality of locative technologies in almost every aspect of contemporary society — from government, to industry, to everyday activities such as finding a restaurant or driving a car. Indeed, it has been claimed that Earth Observation currently provides $500 million in direct benefits to Australia, a figure estimated to increase to $1.7 billion by 2025, while

[1] See 'Datum Modernisation in Australia', *Geoscience Australia* (Web Page) <www.ga.gov.au/scientific-topics/positioning-navigation/datum-modernisation>, archived at <https://perma.cc/6A9J-CASZ>.

[2] Chris Rizos and Donald Grant, 'Australia on the Move: How GPS Keeps Up with a Continent in Constant Motion', *The Conversation* (Online, 6 February 2017) <https://theconversation.com/australia-on-the-move-how-gps-keeps-up-with-a-continent-in-constant-motion-71883>, archived <https://perma.cc/Z9H2-CQ6W>.

precise positioning added $2.3 billion to the Australian GDP in 2012, and is estimated to add more than $8 billion by 2020.[3]

Despite the growing importance of spatial data, surprisingly little close attention has been paid to the legal situation of the new, spatially embedded, digital citizenry. In particular, little attention has been directed towards the legal status of the spatial data involved.[4] A recent article in *The Economist* observed that '[d]igital information is unlike any previous resource; it is extracted, refined, valued, bought and sold in different ways. It changes the rules for markets and it demands new approaches from regulators. Many a battle will be fought over who should own, and benefit from, data.'[5] Companies and government bodies that deal with data treat them as property that is capable of being owned, bought, sold and licensed. Yet, as the Productivity Commission has recently noted, in Australia, 'no one "owns" data; in limited circumstances, copyright law can protect the form in which information is expressed, and it may be possible to claim ownership over a processed dataset'.[6]

This article will consider the extent to which existing intellectual property laws in Australia encompass spatial data and associated products or systems, such as digital maps, cybercartography, geographic information systems ('GIS') and other emerging spatial media. It will begin by examining the changing terrain of geographic information and associated digital products and clarifying terminology for a legal audience. It will then turn to consider how the legal landscape has changed. It will look first at how copyright law was used in the past to regulate the ownership, production and dissemination of analogue

[3] *2026 Spatial Industry Transformation and Growth Agenda: Summary of Key Initiatives and Roadmap to Drive the Future of the Australian Spatial Sector* (Action Plan, 29 March 2017) 6 <https://2026agendacom.files.wordpress.com/2017/04/2026-agenda-action-plan-roadmap-for-release-web.pdf>, archived at <https://perma.cc/UU6U-ATZ3> ('*2026 Agenda*').

[4] A notable exception in Canada is the work of Teresa Scassa and collaborators: see Adam Saunders, Teresa Scassa and Tracey P Lauriault, 'Legal Issues in Maps Built on Third Party Layers' (2012) 66 *Geomatica* 279; Teresa Scassa and DR Fraser Taylor, 'Intellectual Property Law and Geospatial Information: Some Challenges' (2014) 6 *WIPO Journal* 79; Teresa Scassa, 'Legal Rights and Spatial Media' in Rob Kitchin, Tracey P Lauriault and Matthew W Wilson (eds), *Understanding Spatial Media* (Sage, 2017) 158. In Australia, George Cho has also noted some of the problems: see George Cho, *Geographic Information Systems and the Law: Mapping the Legal Frontiers* (John Wiley & Sons, 1998); George Cho, *Geographic Information Science: Mastering the Legal Issues* (John Wiley & Sons, 2005). See also Katleen Janssen and Jos Dumortier, 'The Protection of Maps and Spatial Databases in Europe and the United States by Copyright and the Sui Generis Right' (2006) 24 *John Marshall Journal of Computer and Information Law* 195.

[5] 'Fuel of the Future: The Data Economy', *The Economist* (London, 6 May 2017) 22.

[6] Productivity Commission, Australian Government, *Data Availability and Use* (Inquiry Report No 82, 31 March 2017) 65.

maps and spatial data, and the challenges that arose in that context. It will go on to examine how changes in the digital era have affected the way that the law will apply to digital maps and digital spatial data, questioning whether copyright remains an appropriate legal mechanism for assigning ownership and access rights. Next it will consider whether a database right modelled on that in Europe would provide for better processes and outcomes, concluding that it will not. It will finally turn to consider some of the matters that need to be considered when deciding whether a new category of right is required to address this gap.

Before continuing, some explanation of terminology may be of assistance. This article will use the phrases 'spatial data' and 'geospatial data' as meaning essentially the same thing. In other words, the terms will be used in a broad sense to mean data which refers to a specific location or geographical area.[7] Spatial data can thus cover not just datasets that describe physical geography, but also datasets describing topographical features, cadastral or land title information, transport and infrastructure, location of resources, such as groundwater, or utilities.[8]

The words 'data' and 'information' are frequently used interchangeably by commentators, with little significant impact. Here, we will endeavour to treat them as having a subtly different meaning, by reference to the commonly used 'knowledge pyramid'. In the knowledge pyramid, 'data precedes information, which precedes knowledge, which precedes understanding and wisdom'.[9] Without wishing to get bogged down in technical definitions, which have themselves been the subject of scholarly debate,[10] we will seek to use 'data' in the sense of 'raw elements' that have been extracted through observation, computation, experiment or recordkeeping,[11] while the word 'information' will be used here in a broader or less technical sense, to mean an accumulation of data,

[7] This corresponds to the definition given in the INSPIRE Directive, which states '"spatial data" means any data with a direct or indirect reference to a specific location or geographical area': *Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 Establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)* [2007] OJ L 108/1, art 3(2).

[8] To appreciate the broad array of datasets, see the national datasets for NationalMap: *NationalMap* (Website) <https://nationalmap.gov.au>, archived at <https://perma.cc/LY8X-GQV2>.

[9] Rob Kitchin, *The Data Revolution: Big Data, Open Data, Data Infrastructures and Their Consequences* (Sage, 2014) 9.

[10] Ibid 2–4.

[11] Ibid 2.

or 'data plus meaning'.[12] Geospatial, or spatial, data can be understood broadly as 'any data (quantitative and qualitative) which have a location (eg spatially referenced with coordinates) or topology'.[13]

A *A Changing Landscape: From Paper Map to Spatial Media*

For the majority of people, the chief way of obtaining an understanding of one's location in terms of space and place is through the form of graphic representation known as a map. Maps have been made and used by humans since preliterate and prehistoric times, but have only come to be used in any great numbers in the last five centuries.[14] Across history, maps have embodied a vast array of purposes and objectives including wayfinding, religious and sacred, administrative, military and aesthetic. Today, the Oxford English Dictionary defines a map as

> '[a] drawing or other representation of the earth's surface or a part of it made on a flat surface, showing the distribution of physical or geographical features (and often also including socio-economic, political, agricultural, meteorological, etc, information), with each point in the representation corresponding to an actual geographical position according to a fixed scale or projection …[15]

In the past, a map drawn on paper was the main method of conveying geographic information. While paper-based maps of course combined both geospatial data and the representation of that data, the value of the data tended only to be realised through its representation on a map, chart, plan or survey. Today, however, changes in technology have inverted the relationship, such that the greatest value may lie in the spatial data itself.

Around the time that Australia was being settled by the British, the British state was beginning to assert itself as having key responsibility for, and control over, geographic information through state-ordered mapping activities.[16] This situation prevailed for 200 years in both Britain and its former colony Australia,

[12] Ibid 9.

[13] Tracey P Lauriault, 'Open Spatial Data' in Rob Kitchin, Tracey P Lauriault and Matthew W Wilson (eds), *Understanding Spatial Media* (Sage, 2017) 95, 95.

[14] See Denis Wood, *Rethinking the Power of Maps* (Guilford Press, 2010) 18.

[15] *Oxford English Dictionary* (Online), 'map' (n^1, def I1a).

[16] For example, the Ordnance Survey of Great Britain is usually said to have commenced in 1791: Rachel Hewitt, *Map of a Nation: A Biography of the Ordnance Survey* (Granta, 2010) xxv. The Great Trigonometrical Survey of India began in 1817: Matthew H Edney, *Mapping an Empire: The Geographical Construction of British India, 1765–1843* (University of Chicago Press, 1997) 21–2.

with the state controlling the production, collection, dissemination and use of geographic data and information. As Scassa and Taylor point out, 'governments have a natural interest in and need for these data, which have applications for defence, service delivery, land ownership, resource development, environmental protection, planning and other governmental activities'.[17] However, the state's key role flowed not just from these concerns, but also because the costs of producing, collecting and compiling accurate data were such that very few other bodies had the necessary financial resources.

The beginnings of the digital transformation of mapping can be roughly dated back to the 1960s, when the Canadian Geographic Information System was designed to allow the computerisation of land measurement.[18] The United States was not far behind, with the US Bureau of the Census creating digital records of streets to assist with the management of census records.[19] By 1973, the first computer-made map had been published in the United Kingdom, and soon cartographic agencies across the world were putting computers to work in map-making.[20] Alongside these developments in computerised cartography, the emergence of digital remote sensing via satellite began to offer new sources of data on the appearance of the earth, as well as methods of measuring location.[21]

Much of the early literature on developments in this field focuses on GIS and their implications for science, government and industry,[22] with a smaller subset examining their legal implications.[23] In the last 10 years, however, both technology and practice has moved beyond standalone, desktop GIS used by a

[17] Scassa and Taylor (n 4) 80; Cf Cho, *Geographic Information Science* (n 4) 55–6.

[18] Paul A Longley et al, *Geographic Information Systems and Science* (John Wiley & Sons, 2nd ed, 2005) 16.

[19] Ibid 16–17.

[20] Ibid 17.

[21] Ibid 17–18.

[22] See, eg, Harlan J Onsrud and Gerard Rushton (eds), *Sharing Geographic Information* (Rutgers, 1995); Longley et al (n 18).

[23] Cho, *Geographic Information Systems and the Law* (n 4); Arthur Hoyle, Eugene Clark and George Cho, 'Intellectual Property Issues in the Development, Use and Commercialisation of Geographic Information Systems: An Australian Perspective' (1997) 8 *Journal of Law and Information Science* 113. According to National Geographic, '[a] geographic information system (GIS) is a computer system for capturing, storing, checking, and displaying data related to positions on Earth's surface. GIS can show many different kinds of data on one map … This enables people to more easily see, analyze, and understand patterns and relationships': 'GIS (Geographic Information System)', *National Geographic* (Web Page) <http://nationalgeographic.org/encyclopedia/geographic-information-system-gis/>, archived at <https://perma.cc/NGX7-YKRW>.

small number of government or commercial actors. Now, as Kitchin, Lauriault and Wilson have noted, 'a varied set of new, networked and often mobile spatial technologies have been developed that are open to use, contributions and editing by anyone with access to the internet'.[24] These new technologies are spatial in the sense that location and mapping are core to the way in which they operate.[25] The term 'spatial media' was coined by Crampton in 2009 to cover this diverse range of technologies and activities.[26] They include now-familiar examples of online interactive mapping tools, such as Google Maps; interactive globes, such as Google Earth; user-generated spatial databases and mapping systems, such as OpenStreetMap ('OSM'); and locative media such as satnavs.[27] They also extend to applications which can transform other media into spatial media through the provision of applications which allow users to georeference (or geotag) tweets or posts on social media apps.[28] They can include mobile devices that have been location-enabled, algorithms underwriting location-based advertising practices and social review sites which allow users to find services and products on the basis of location.[29]

The transformation of this field has been made possible by the transition to Web 2.0 —a transition from a web which was, at the end of the last millennium, simply a data portal and repository towards a new web of networked, interoperable services and applications.[30] Leszczynski dates the transformation to 2005, when Google launched Google Maps and Google Earth, and then made public the application programming interface ('API') which allowed users to develop their own applications on top of the Google services.[31] These activities contributed heavily to the emergence of the 'geoweb', which can be defined as 'the aggregate of geographically-referenced or "marked-up" information that is increasingly used to organize and deliver content over the Web'.[32] Much of this

[24] Rob Kitchin, Tracey P Lauriault and Matthew W Wilson, 'Understanding Spatial Media' in Rob Kitchin, Tracey P Lauriault and Matthew W Wilson (eds), *Understanding Spatial Media* (Sage, 2017) 1, 1.

[25] Ibid.

[26] See Jeremy W Crampton, 'Cartography: Maps 2.0' (2009) 33 *Progress in Human Geography* 91.

[27] Kitchin, Lauriault and Wilson, 'Understanding Spatial Media' (n 24) 1.

[28] Ibid 1–2.

[29] Agnieszka Leszczynski, 'Spatial Media/tion' (2015) 39 *Progress in Human Geography* 729, 729–30.

[30] Agnieszka Leszczynski, 'Situating the Geoweb in Political Economy' (2012) 36 *Progress in Human Geography* 72, 73.

[31] Ibid 72.

[32] Ibid (citations omitted). Leszczynski defines 'marked-up' as 'annotated, or described, using a machine-readable syntax': at 72 n 1.

geographic data and information is provided by volunteers — users without a cartographical or geographical background — who simply collect and distribute it. This has been labelled by Michael Goodchild as 'volunteered geographical information', or VGI.[33]

These developments have unwound the levels of control previously exercised by government bodies over the collection and dissemination of geographic data. However, while the state must now share the stage with corporations, non-governmental organisations and private citizens as a source of authoritative geographic data, it remains true that the collection, systematisation and maintenance of data continue to be integral to activities that government bodies carry out for public, administrative services. Moreover, they continue to require significant investment in terms of time, labour and expense. The subsequent integration of data into value-added products and services requires further investment in and interactions between hardware and software, and between data and device. At the same time, many other businesses are making locative technologies central to their operations, despite not considering themselves part of the 'spatial industries', with current popular examples including Uber, Facebook and Amazon.

The huge economic costs, and the potential commercial value, of geospatial information, which is now so deeply embedded in such a vast array of daily activities, and so integral to decision-making of individuals, government and corporate bodies, raise a number of legal issues for consideration. Important questions arise relating to confidential information and privacy, the best known example of which is the public outcry over some of the images displayed in Google Street Maps.[34] Legal liability for erroneous or misleading information also raises serious issues.[35] While some information created and collected by government agencies is subject to legal regulation in order to ensure its accuracy, authority and quality (such as requiring certification of land surveyors for cadastral records),[36] data collected by non-state actors will remain unregulated.

[33] Michael F Goodchild, 'Citizens as Sensors: The World of Volunteered Geography' (2007) 69 *GeoJournal* 211, 212.

[34] See, eg, S James Snyder, 'Google Maps: An Invasion of Privacy?', *Time* (New York, 12 June 2007) <http://content.time.com/time/business/article/0,8599,1631957,00.html?iid=sr-link1>; Sarah Elwood and Agnieszka Leszczynski, 'Privacy, Reconsidered: New Representations, Data Practices, and the Geoweb' (2011) 42 *Geoforum* 6.

[35] Cho, *Geographic Information Systems and the Law* (n 4) ch 4; Cho, *Geographic Information Science* (n 4) 356–8. See also George Cho, 'Geographic Data and Legal Liability Issues' in Katleen Janssen and Joep Crompvoets (eds), *Geographic Data and the Law: Defining New Challenges* (Leuven University Press, 2012) 109.

[36] Scassa and Taylor (n 4) 81. See also Cho, *Geographic Information Science* (n 4) 383–8.

These are important issues that must be considered in the search to identify and develop a public infrastructure which will allow the Australian spatial industries to grow and innovate in ways which benefit the Australian public.[37] However, underlying all of them is the legal status of the geospatial data involved. This is the concern of this article. Given the enormous commercial value of geospatial data, it is hardly surprising that its creators and compilers have asserted property rights in their compilations. While the particular property right which is being asserted is not always clear, the chief right implicated is copyright. Copyright's key advantage is that it allows owners of copyright works to exert control over the subject matter in a manner reaching far beyond what can be achieved by either contract or technological restrictions.[38] As noted above, in both Australia and the United Kingdom, governments have been particularly vigilant in asserting proprietary claims over their compilations of spatial data, as well as maps and charts produced from that data, or used to create that data, and have used Crown copyright to exercise control over access and use of their geospatial data and maps.[39]

This restrictive approach has led to some high-profile oppositions and critiques,[40] leading to a change of tack. In the last 10 years there has been a shift in both countries towards an 'open government' model. Under this model, government bodies have begun to adopt policies that enhance access to, and re-use of, public sector information ('PSI').[41] Geospatial data is now released online by various federal and state bodies in Australia. However, while the information is released 'for free', it is most commonly made available pursuant to a

[37] This objective and a framework for its achievement is set out in the *2026 Agenda* (n 3).

[38] Scassa (n 4) 159.

[39] See, eg, *Controller of Her Majesty's Stationery Office v Green Amps Ltd* [2007] EWHC 2755 (Ch); *Copyright Agency Ltd v New South Wales* (2007) 159 FCR 213.

[40] OSM was established in the UK as a response to the high costs charged by the Ordnance Survey: Leszczynski, 'Situating the Geoweb in Political Economy' (n 30) 81. In the 2009 Victorian bushfires, as the Commonwealth Fire Association website struggled to keep up with the demand for accurate information, Google claims that it was prevented from overlaying data on Google Maps which displayed real-time information about fire location and intensity by the Department of Sustainability and Environment's refusal to provide information about fires on public land, relying on its Crown copyright in the data: see David Braue, 'Australia Government Limited Google's Bushfire Map', *CNET* (Web Page, 13 February 2009) <www.cnet.com/au/news/australia-government-limited-googles-bushfire-map/>, archived at <https://perma.cc/QR3C-9QEP>.

[41] See Anne Fitzgerald, *Open Access Policies, Practices and Licensing: A Review of the Literature in Australia and Selected Jurisdictions* (July 2009); Brian Fitzgerald (ed), *Access to Public Sector Information: Law, Technology and Policy* (Sydney University Press, 2010) vol 1; Department of Communications and the Arts, Australian Government, *Guidelines on Licensing Public Sector Information for Australian Government Entities* (Guidelines, September 2016) 3.

licence. It is Australian government policy that the licence used is a Creative Commons ('CC') commercial re-use and attribution licence, being either version 3.0 or, ideally, 4.0.[42] The release of geospatial data under CC licences has been heralded as a welcome development in the campaign to improve public access to geospatial data and other PSI.[43]

However, what is generally overlooked is the fact that these CC licences are predicated upon the assumption that there is a property right, namely copyright, capable of being licensed. The CC licence 3.0 makes clear that it applies only to work already subject to copyright.[44] The 4.0 licence is expressed more broadly, and covers 'the artistic or literary work, database, or other material',[45] raising the question whether the introduction of the words 'other material' aimed to address the changes brought by the knowledge-based industries and data economy.[46] The rights granted under the licence are referred to as 'Copyright and Similar Rights'.[47] The term 'similar rights' is not exhaustively defined and it is not clear what it would mean under Australian law. Commercial bodies which create, collect and disseminate spatial data also use licences to make the material available to other parties. These licences are likewise based upon the assumption that there is a property right that is capable of being licensed.[48]

[42] Department of Communications and the Arts (n 41) 5.

[43] Judith Bannister, 'Open Government: From Crown Copyright to the Creative Commons and Culture Change' (2011) 34 *University of New South Wales Law Journal* 1080; Anne Fitzgerald, 'Juggling Information Policy, Rights to Information and Copyright Licensing to Enhance the Accessibility and Reusability of Spatial Data: The Australian Experience' in Katleen Janssen and Joep Crompvoets (eds), *Geographic Data and the Law: Defining New Challenges* (Leuven University Press, 2012) 53.

[44] 'Attribution 3.0 Australia', *Creative Commons* (Licence) s 1(g) <https://creativecommons.org/licenses/by/3.0/au/legalcode>, archived at <https://perma.cc/4PVB-KAY7>.

[45] 'Attribution 4.0 International', *Creative Commons* (Licence) s 1(f) <https://creativecommons.org/licenses/by/4.0/legalcode>, archived at <https://perma.cc/3R3Q-D3AA>.

[46] 'The "data economy" is characterised by an ecosystem of different types of market players — such as manufacturers, researchers and infrastructure providers — collaborating to ensure that data is accessible and usable': European Union, European Commission, *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: 'Building a European Data Economy'*, COM(2017) 9 final, 10 January 2017, 2 ('*Building a European Data Economy*').

[47] 'Attribution 4.0 International' (n 45).

[48] For example, DigitalGlobe is a company which provides high-resolution Earth imagery, data and analysis to customers from its own satellites. Its Internal Use End User Licence provides that the 'Customer recognizes and agrees that the Products are the property of DigitalGlobe and contains [sic] valuable assets and proprietary information of DigitalGlobe' and 'All right, title and interest in and to the Products, including all corrections, enhancements or other modifications made by DigitalGlobe …, and all Intellectual Property Rights therein are the sole and exclusive property of DigitalGlobe or its suppliers, as applicable': 'Internal Use License', *Digital*

However, in Australia, the only relevant property right would arise as a result of copyright legislation, as there is no database right in Australia and no statutory recognition of 'other' intellectual property rights falling outside the recognised categories of patent, trade mark, plant variety rights and circuit layouts.

This article, however, argues it is far from certain that copyright does in fact subsist in the material being licensed. The next section, therefore, examines how copyright law has protected geographic information in the past, and then turns to consider how the extensive technological changes of the last 30-odd years have affected the ways in which maps are made and spatial data are collected, and the impact this might have on their legal regulation.

II Copyright Law and Geospatial Information

There is a long historical tradition of applying copyright law to geospatial data and information. In the days before 'spatial media', the most popular way of presenting geospatial information was in the form of a map, and maps have been protected as copyright works since the 18th century. However, this protection has not always fitted easily into existing and emerging copyright paradigms. Problems and debates have arisen in relation to the subject matter category, authorship, originality and infringement. In the digital era they continue to do so.

A *Copyright Protection in the Analogue Era: The Paper Map*

In considering how maps and geographic information were created and produced in the analogue era, a simple diagram may be of assistance.

Globe (License, 7 June 2017) cls 4–5 <www.digitalglobe.com/legal/internal-use-license>. Its other End User License Terms use similar terms: 'Legal Information', *DigitalGlobe* (Web Page) <www.digitalglobe.com/legal/information#licenses>, archived at <https://perma.cc/W6FM-B8EK>.

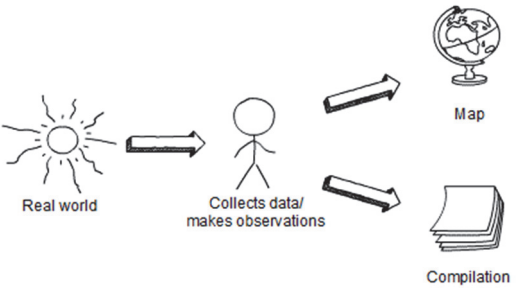

Figure 1: Analogue Map-Making[49]

Making a paper map frequently involved a number of steps, which could potentially involve different people or bodies. The diagram provides a greatly simplified picture of a single person, collecting data based on observations of the real world, and producing a map from those data. Of course, the collection of data may in fact have been carried out by different people at different times; it may have involved actual survey or compilation from different secondary sources, or a combination of the two; the data would have been assessed, calculations made from it, and decisions made about how best to portray that data as a map; an engraver would have been employed to make the engraving; a colourist may have been employed to colour the map; a printer would have been employed to make copies; and the whole endeavour may have been overseen and funded by one or more people who may or may not have also taken on some of the other roles. For copyright purposes, the only thing that mattered was the final output — often a map, but possibly a written description — which was the copyright work.

1 *Subject Matter*

From 1710, the *Statute of Anne* protected the authors and publishers of books, so geographic information was protected against copying if it was published in a book, whether or not it took the format of a map or of some other kind of compilation (such as a roadbook or dictionary).[50] From 1767, maps, charts and

[49] Diagram created using SimpleDiagrams software: see *SimpleDiagrams* (Website) <www.simplediagrams.com>, archived at <https://perma.cc/9Z3B-EPJV>.

[50] *Copyright Act 1710*, 8 Anne, c 21, s 1 ('*Statute of Anne*').

plans were protected against copying under the *Engravings Act*.[51] In 1842, a new literary copyright statute was passed, and the word 'book' was defined to include 'every Map, Chart or Plan separately published'.[52] In *Stannard v Lee*, James LJ approved of the change, stating, '[f]ormerly maps had been considered artistic works, now they were to be brought into their proper place as literary works. And rightly so, in my opinion, for maps are intended to give information in the same way as a book does.'[53]

In 1905, Australia adopted its first federal copyright act. Maps, charts, diagrams and plans were included within definition of 'book', while artistic work was defined to include 'engraving, etching, print, lithograph, woodcut, photograph or other work of art'.[54] There was thus the potential for a map to fall into either category. In 1912, Australia adopted the *Imperial Copyright Act*, already adopted in Great Britain, which replaced the word 'book' with 'literary work' but explicitly included 'maps, charts, plans, tables, and compilations'.[55] 'Artistic work' was again defined to include 'engravings'.[56] In *Robinson v Sands & McDougall*, the first case to consider the question of copyright in maps, Barton J treated a map as a literary work, within the meaning of s 35 of the *Copyright Act 1912* (Cth).[57] Seventy years later, in the UK decision of *Geographia Ltd v Penguin Books Ltd*, Whitford J stated that '[u]nder the *Copyright Act 1956* maps are by definition artistic works'.[58] However, he went on to concede that a map might be entitled to protection under either head, and later referred to the map in issue as being 'a compilation of information which involved a good deal of time and effort'.[59] In Australia, there likewise seemed to be uncertainty under the *Copyright Act 1968* (Cth), with Hill J observing, in a 1989 case involving street directories, that '[i]t is beyond dispute that as each initial base map was prepared, copyright existed in that base map as an original artistic or perhaps

[51] *Engraving Copyright Act 1767*, 7 Geo 3, c 38. Engravings generally, but not maps explicitly, had been protected since 1735: *Engraving Copyright Act 1735*, 8 Geo 2, c 13. The 1767 Act was amended in 1777: *Prints Copyright Act 1777*, 17 Geo 3, c 57.

[52] *Copyright Act 1842*, 5 & 6 Vict, c 45, s 2.

[53] (1871) LR 6 Ch App 346, 349.

[54] *Copyright Act 1905* (Cth) s 4.

[55] *Copyright Act 1912* (Cth) sch s 35(1) (definition of 'literary work').

[56] Ibid (definition of 'artistic work').

[57] *Robinson v Sands & McDougall Pty Ltd* (1916) 22 CLR 124, 126.

[58] [1985] FSR 208, 209.

[59] Ibid. Whitford J later refers to 'a map in the form of a compilation': at 210.

literary work'.[60] By 2008, it was accepted that survey plans were artistic works under the *Copyright Act 1968*.[61]

The confusion, or overlap, in the way that maps were protected over this period is partly the result of the shift that took place over the course of the 18th and 19th centuries from protecting tangible items (such as books and prints) to intangible 'works'.[62] But it also flows from the dual functions that maps perform. As noted in a leading textbook of cartography, *Elements of Cartography,* maps have two purposes: first, to serve 'as a storage medium for information which humanity needs'; and second, to provide 'a picture of the world to help us understand the spatial patterns, relationships and complexities of the environment in which we live'.[63] In other words, they are simultaneously a source of information and a visual image. Yet Anglo-Australian copyright law requires a work to fit into one of the defined categories in order to qualify for protection and the question of whether a work can fall into more than one category at once is yet to be directly addressed in Australia.[64] The question of which subject-matter 'box' a map falls into in Anglo-Australian copyright may also be important to the next issue — the question of originality — to which we now turn.

2 *Originality and Authorship*

When maps are treated as compilations of information, they find themselves enmeshed in debates over how and whether copyright law should protect fact-based works and, in particular, whether they can be considered to be 'original' under copyright law. Since the 18th century, judges have sought ways to limit copyright protection to 'expression' rather than ideas or facts,[65] a principle now

[60] *Universal Press Pty Ltd v Provest Ltd* (1989) 87 ALR 497, 500.

[61] *Copyright Agency* (n 39) 215 [3].

[62] See Oren Bracha, 'The Ideology of Authorship Revisited: Authors, Markets, and Liberal Values in Early American Copyright' (2008) 118 *Yale Law Journal* 186, 224–48.

[63] Arthur H Robinson et al, *Elements of Cartography* (John Wiley & Sons, 6th ed, 1995) 4–5.

[64] The question of whether a work can fall into more than one category has been considered in obiter dicta in several cases in the UK: see *Anacon Corporation Ltd v Environmental Research Technology Ltd* [1994] FSR 659, 662–4; *Electronic Technique (Anglia) Ltd v Critchley Components Ltd* [1997] FSR 401, 412–13; *Sandman v Panasonic UK Ltd* [1998] FSR 651, 658. In Australia, it was not considered problematic for a work to fall into both categories of artistic and literary work in *Kalamazoo (Aust) Pty Ltd v Compact Business Systems Pty Ltd* [1990] 1 Qd R 231, 249.

[65] For example, in *Millar v Taylor* (1769) 4 Burr 2303, 2331; 98 ER 201, 216 Willes J stated: 'The book conveys knowledge, instruction, or entertainment: but multiplying copies in print is a quite distinct thing from all the book communicates. And there is no incongruity, to reserve that right; and yet convey the free use of all the book teaches.' See also *Hollinrake v Truswell* [1894] 3 Ch 420, 426–7.

embodied in art 9 of the *TRIPS Agreement,*[66] and accepted as an axiomatic principle of copyright law.[67] However, maps and other compilations of geographic information, such as roadbooks, have long been protected by copyright law. In the 18th century the question of originality was directed not at whether the map or compilation could be protected at all due to its factual nature, but at whether it could be said to be an infringement. In other words, courts were concerned with whether a map could be protected because it was 'original' in the sense that it was not simply a copy of another map, and whether the same could be said of the allegedly infringing map.[68]

The problem with characterising maps as compilations of factual information is not simply that it raises questions as to whether copyright is the appropriate vehicle to protect such works, but more fundamentally that it mischaracterises maps themselves. The modernist view of maps is that they are 'objective, neutral products of science',[69] which provide 'a mirror, a graphic representation, of some aspect of the real world … the role of a map is to present a factual statement about geographical reality'.[70] However, as the work of Harley and others demonstrates,[71] this modernist approach was debunked some time ago for cartographers, geographers and historians. Rather, as Mark Monmonier has famously observed, it is now generally accepted that '[n]ot only is it easy to lie with maps, it's essential'.[72] It is essential to lie because no map can portray everything and, even if it could, it must do so on a different scale and using

[66] See *Marrakesh Agreement Establishing the World Trade Organization*, opened for signature 15 April 1994, 1867 UNTS 3 (entered into force 1 January 1995) annex 1C ('*Agreement on Trade-Related Aspects of Intellectual Property Rights*') art 9(2), which provides that '[c]opyright protection shall extend to expressions and not to ideas, procedures, methods of operation or mathematical concepts as such'.

[67] See, eg, *IceTV Pty Ltd v Nine Network Australia Pty Ltd* (2009) 239 CLR 458, 472 [28].

[68] See Kathy Bowrey, 'On Clarifying the Role of Originality and Fair Use in Nineteenth Century UK Jurisprudence: Appreciating "the Humble Grey which Emerges as a Result of Long Controversy"' in Catherine W Ng, Lionel Bently and Giuseppina D'Agostino (eds), *The Common Law of Intellectual Property: Essays in Honour of Professor David Vaver* (Hart Publishing, 2010) 45; Isabella Alexander, '"Manacles upon Science": Re-Evaluating Copyright in Informational Works in Light of 18th Century Case Law' (2014) 38 *Melbourne University Law Review* 317.

[69] Rob Kitchin and Martin Dodge, 'Rethinking Maps' (2007) 31 *Progress in Human Geography* 331, 331.

[70] JB Harley, *The New Nature of Maps: Essays in the History of Cartography* (Johns Hopkins University Press, 2001) 35.

[71] See generally ibid.

[72] Mark Monmonier, *How to Lie with Maps* (University of Chicago Press, 2nd ed, 1996) 1.

symbols for the features represented. In this way, all maps 'offer a selective, incomplete view of reality'.[73]

Thus, the central 'lie' that a conventional, geographic map tells to its reader is that it is an objective depiction of a factual reality. In order for this lie to be effective, authorship must be rendered invisible, or anonymous. As Dodge and Kitchin explain, '[n]aming the authors would suggest subjectivity at play in map creation and denude the pretence of objectivity underpinning the correspondence between graphical signs and the territory represented'.[74] Critical cartographers seek to establish the ways in which maps *create* rather than simply *reflect* knowledge.[75] However, lawyers and judges involved in litigation, as well as commentators on the resulting judgments, often oscillate between approaches. At times, they appear to cling to the notion of the map as representing an ascertainable, objective geographical truth, as in the 1866 case of *Kelly v Morris*.[76] Here Wood VC observed that '[i]n the case of a dictionary, map, guide-book, or directory, *when there are certain common objects of information which must, if described correctly, be described in the same words*, a subsequent compiler is bound to set about doing for himself that which the first compiler has done'.[77] Likewise, Barton J in *Robinson v Sands & McDougall* stated that '[n]o man can invent a map, the office of which is to present things ascertained'.[78]

This approach, as mentioned above, has the effect of bringing maps into the debate over the extent of copyright protection for factual works, and forces courts to find ways to justify protecting them despite their supposedly factual nature. In keeping with the 'factual' version of maps, this has led litigants to base their claims for copyright protection upon the labour, effort and expense involved in their creation, hence the emphasis in *Kelly v Morris* on the activities of the surveyor in gathering his facts.[79] However, labour, effort and expense perhaps seeming inadequate in some cases, courts have simultaneously sought to look beneath the apparently objective surface of the map to find a cartographer exercising subjective interpretation and intellectual creativity.

[73] Ibid.

[74] Martin Dodge and Rob Kitchin, 'Crowdsourced Cartography: Mapping Experience and Knowledge' (2013) 45 *Environment and Planning A* 19, 26.

[75] Kitchin and Dodge, 'Rethinking Maps' (n 69) 331–7.

[76] (1866) LR 1 (Eq) 697.

[77] Ibid 701 (emphasis added).

[78] *Robinson* (n 57) 133.

[79] See *Kelly* (n 76).

Thus, while Barton J focused on the factual elements of the map in *Robinson v Sands & McDougall,* looking at 'points of difference from previous maps',[80] he also emphasised the role of the cartographer, in this case Robinson himself, noting he 'not only did a great deal of the artistic, but all the intellectual work involved'.[81] This was the work relevant for copyright, and was distinguished from 'the manual work not done by himself' but which was 'carried out by his staff under his instructions'.[82] While Barton J does downplay the role of the 'staff', as well as the Education Department, which made suggestions and provided information, it is noteworthy that he pays attention not just to the factual information in the map but also its purpose, namely its 'suitability for use in Public Schools'.[83]

A similar sensitivity can be discerned in the appeal judgment. The Full Court said that Robinson, by

> taking the common stock of information in Australia and, by applying to it personal, that is, independent, intellectual effort in the exercise of judgment and discrimination, had produced a map that was new in the sense that, in respect of its size and outlines, its content and arrangement and its general appearance, it presented both in its totality and in specific parts distinct differences from other existing maps.[84]

Similarly, when referring to what had been copied, the Court considered that there were similarities 'of size, of draftsmanship, of style, of printing type, and geographical selection and general appearance' between the two works.[85] Here, the Court is clearly paying attention to elements of the map beyond the mere portrayal of facts or information, a point that has sometimes been downplayed by those depicting the appeal decision as authority for labour and judgment in the selection and compilation of factual information.[86]

[80] Ibid 133.

[81] Ibid 129.

[82] Ibid.

[83] Ibid.

[84] *Sands & McDougall Pty Ltd v Robinson* (1917) 23 CLR 49, 52.

[85] Ibid 52–3.

[86] *Desktop Marketing Systems Pty Ltd v Telstra Corporation Ltd* (2002) 119 FCR 491, 532–5 [160]–[167].

Similarly, 70 years later in the UK decision of *Geographia v Penguin*, consideration of effort and labour was combined with a recognition of a cartographer's 'personal style' conferring 'individual identity'.[87] Whitford J placed considerable emphasis on the work carried out by the cartographer, Mr Middleditch. It is notable that he accepted the evidence of the expert witnesses that 'individual cartographers can be regarded as craftsmen',[88] and that Mr Middleditch was 'highly skilled'.[89] However, most attention was devoted to the work carried out by Mr Middleditch in selecting and using his source material, and assessing the accuracy or otherwise of his choices. Whitford J concluded that the greatest evidence of similarity could be found in the colours chosen, which it characterised as 'of very minor significance'.[90]

In any event, it is, without doubt, apparent in the cases that there is a tension between the factual elements of a map and its non-factual elements, whether driven by artistic considerations, questions of purpose, or other factors. Emphasis on the cartographer as the 'author' can resolve these tensions to some extent but has the further effect of erasing other contributions — whether in the form of source material being employed, or collaborating parties such as surveyors, engravers, colourists or printers. Again, to quote Dodge and Kitchin, this involves

> an attempt to position the cartographic representation as the single objective voice speaking onto space and not a polyvocal, subjective recantation that actually brings the space into being and which acknowledges the full range of multiple authors, with different skills and diverse subjectivities, that have contributed to processes of specification, data collection, checking, processing, drawing, labelling, deleting, designing, and so on. Such an acknowledgement exposes the map to suggestions of fallibility.[91]

In order to avoid undermining the authority of the map, copyright law must therefore insist on both its objectivity and its authored status. No wonder, then, that the protection of maps 'poses serious problems for both copyright theory and practice'.[92]

[87] *Geographia* (n 58) 210.

[88] Ibid.

[89] Ibid.

[90] Ibid 218.

[91] Dodge and Kitchin, 'Crowdsourced Cartography' (n 74) 26.

[92] Dennis S Karjala, 'Copyright in Electronic Maps' (1995) 35 *Jurimetrics* 395, 395.

3 *Ownership*

Once it is accepted that a map is a copyright work, it is capable of being owned as an item of intangible property. However, as already noted, this can give rise to tensions between private, public and state interests. If the data in question has been collected by the government, in pursuance of its public duties, then should maps produced with that data be the property of the government (under the Crown copyright provisions),[93] or should they be in the public domain, since public funds were used to create them? This issue arose as early as 1801, when John Cary was employed to survey the post roads on behalf of the British Post Office. He was allowed to sell the maps he created to cover his costs, but when he brought an action against Francis Newbery for copying them, Newbery responded that he had assumed that the survey in question was the property of the public 'for whose use and at whose expense it had been made'.[94] Over 200 years later, the defendant in a case brought by the UK Ordnance Survey over the copying of its maps attempted to argue it had a 'God-given right of access' to the maps.[95]

While in both cases this argument could be viewed as a cynical attempt to avoid liability, they nonetheless raise a serious issue as to the tension between Crown copyright, private rights and public access. This tension was illustrated more recently in Australia in relation to surveyor's plans. In 2005 two state governments made submissions to the Copyright Law Review Committee, seeking clarification that Crown copyright would apply to survey maps and plans under the *Copyright Act 1968*.[96] However, two years later the Federal Court rejected New South Wales' claim that it held Crown copyright in surveys carried out to satisfy statutory requirements, holding that copyright was in fact owned by individual surveyors.[97]

[93] See *Copyright Act 1968* (Cth) s 176.

[94] Daniel Paterson, *A New and Accurate Description of All the Principal Cross Roads in England and Wales, and Part of the Roads of Scotland* (Longman and Rees, 13th ed, 1803) xvi. See also Alexander, '"Manacles upon Science"' (n 68).

[95] *Controller of Her Majesty's Stationery Office* (n 39) [12]. See also Estelle Derclaye, 'Of Maps, Crown Copyright, Research and the Environment' (2008) 30 *European Intellectual Property Review* 162, 162–4.

[96] Copyright Law Review Committee, *Crown Copyright* (Report, 2005) 71–2 [5.32]–[5.33].

[97] *Copyright Agency* (n 39) 241 [141]–[142], 243 [153]. See also Judith Bannister, 'Public Access to Copyright Works Submitted to Government: *Copyright Agency Ltd v New South Wales* and the Implications for Information Access' (2008) 36 *Federal Law Review* 383.

4 *Infringement*

Finally, establishing infringement can also present challenges for the application of copyright to maps. As a factual matter, it can be difficult to establish that one map has been copied from another where both have drawn on the same or similar sources for their creation. Since the 19th century, litigants have pointed to mistakes in maps (originally accidental but increasingly deliberately inserted as 'map traps') to provide evidence of copying.[98] Still more complex questions arise, as Judith Bannister has noted, in relation to objective similarity and indirect copying when what is copied is reproduced in a different form.[99] In *Copyright Agency Ltd v New South Wales*, the government had copied data from the surveyors' plans (artistic works) into the Digital Cadastral Database.[100] The Federal Court treated this as a question of insubstantial copying and the High Court refused leave to appeal on the point,[101] but if more data had been copied this issue might not have been so quickly dismissed.

B *The Digital Map*

It is suggested in the previous section that some of the perceived problems in protecting maps using copyright law stem from an over-commitment to the modernist view of maps as a simple 'mirror' of the world,[102] reflecting objectively ascertainable geographic facts using conventional signs. Yet, if we adopt a more nuanced and sophisticated view of maps as artificial artefacts, just as beholden to individuality and to underlying motives both expressed and unexpressed, conscious and unconscious, as any other text, then some of these problems fall away. Just as a writer of fiction who sets her story in the streets, stations and cafes of Melbourne cannot prevent another writer from setting a story in the same streets, stations and cafes, a mapmaker cannot prevent others from mapping the same places. Both cartographer and writer, however, can prevent another from using their 'expression'. In the case of the writer this may extend

98 For 18th-century examples, see *Sayre v Moore* (1785) 1 East 361; 102 ER 139 and unreported cases *Steel v Moore* (1789), *Heather v Moore* (1798), discussed in Isabella Alexander, '*Sayer v Moore* (1785)' in Jose Bellido (ed), *Landmark Cases in Intellectual Property Law* (Hart Publishing, 2017) 59. For a more recent example, see *Geographia* (n 58) 214.

99 Bannister, 'Public Access to Copyright Works Submitted to Government' (n 97) 388.

100 *Copyright Agency* (n 39) 244–5, [160]–[162].

101 Ibid 245 [165]–[167]; Transcript of Proceedings, *Copyright Agency Ltd v New South Wales* [2007] HCATrans 700.

102 See Harley (n 70) 35.

beyond words to characters, scenes and atmosphere; in the case of the cartographer we can also look to the expressive choices made to assess whether infringement has occurred — what was included, what was omitted, what visual techniques are used, what is the objective of the creator and the impression gained by the viewer. As Monmonier explains, 'a single map is but one of an indefinitely large number of maps that might be produced for the same situation or from the same data'.[103]

However, even this recognition may not achieve the level of protection desired, if the object is to protect the information or data contained in the map from being copied. Have these problems improved or worsened in the age of digital maps? To analyse this, it is necessary to consider in more detail how map-making has changed.

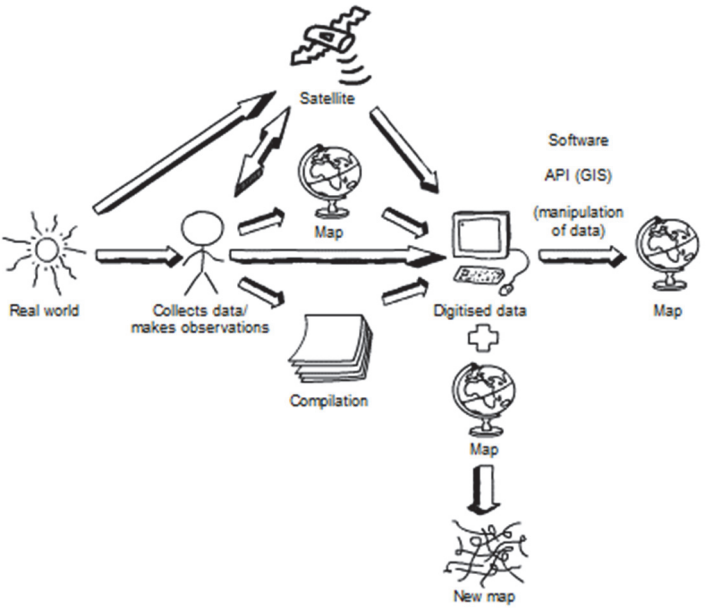

Figure 2: Digital Map-Making[104]

[103] Monmonier (n 72) 2 (emphasis omitted).

[104] Diagram created using SimpleDiagrams software: see *SimpleDiagrams* (n 49).

The diagram in Figure 2, as in Figure 1, markedly simplifies the processes and people involved, but it does demonstrate how the collection and treatment of geographical data has changed. This occurs, broadly, in one of two ways: directly from the environment, or by digitising an analogue map that already contains that data. Data can be gathered from the environment either by ground survey, or using remote sensing. Remote sensing involves collecting images of features on the ground (land or sea) using devices not in direct contact with those features.[105] Platforms containing remote sensing devices include aircraft, ships, submarines and satellites.[106] While humans are still involved in this collection, their role is less direct. They may be involved in programming or operating the remote sensors, or in enhancing the data once it has been gathered. Much of the process, however, is now automated.

Once gathered, this data will be stored in an electronic database. This database is the key to mapping today. The database will contain co-ordinate data, which is necessary for drawing a graphic product, as well as information about the features that will be on that map. Features will include things like buildings, bridges, roads or rivers. Thus a spatial dataset consists of locational and non-locational information about features, the attributes of those features and the relationships between those features.[107] Data from this database might then be turned directly into the visualisation commonly considered a map, using software (such as a GIS), including APIs. Or it might be added to an existing digital map (a base layer) to create a new, mashup map.

The term 'digital mapping' broadly covers all these activities, such that a 'digital map' could mean a digital file, a digital file imported into a GIS, the output of that file, or a networked collaboration taking place online, as part of the 'geoweb'.[108] Any legal analysis will therefore depend to some extent on the particular activities or outputs in question. For the purposes of a more general analysis, however, this article draws on the view of the authors of the sixth edition of *Elements of Cartography* that contemporary cartography provides two distinct products: 'digital database[s] replacing the paper map as the storage medium for geographic information'; and 'cartographic visualizations on … different media' which provide 'a picture of the world' and 'help us understand … spatial patterns, relationships and … the environment' in the same way as paper maps do (or have done).[109] Thus, there are two potential items of

[105] Robinson et al (n 63) 127.

[106] Ibid.

[107] Ibid 169.

[108] Jeremy W Crampton, 'Digital Mapping' in Rob Kitchin, Tracey P Lauriault and Matthew W Wilson (eds), *Understanding Spatial Media* (Sage, 2017) 35.

[109] Robinson et al (n 63) 5.

value: the stored geospatial data, and the visual presentation of that data. This article will refer to the cartographic visualisation as the 'digital map', notwithstanding its conceptually broader sweep. We now turn to consider whether copyright applies either to the digital map or to the geospatial data.

1 *The Cartographic Visualisation (or Digital Map)*

The first question to address is whether copyright law can protect the cartographic visualisation or output commonly known as the 'map'. Once again, we will consider whether this digital map meets the criteria for copyright protection, namely: subject matter; material form; originality and authorship.

(a) Subject Matter

Digital maps present similar issues for categorisation to those for paper maps, with additional layers of complexity arising from the different ways in which the map might be produced. We can start by considering a familiar, albeit complex, map — a Google Map, displayed on a mobile device. It would seem that such a map could potentially be characterised as a computer program as defined in s 10 of the *Copyright Act 1968*, namely 'a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result'.[110] However, this would be to focus on the instructions producing the map, rather than the map (output) itself. Can the displayed map therefore be considered an artistic work (as a drawing) or a literary work (as a compilation)? In *StatusCard Australia v Rotondo*, Chesterman J rejected the plaintiff's argument that the screen display in question was either a literary or an artistic work.[111] However, *StatusCard Australia* might be distinguished as the display in that case, absent the information contained therein (which was provided by another party), was simply a table of coloured columns or rectangles. It was thus not a literary work and, in the sense that it could be considered a 'drawing', the judge found it was so simple and so much compelled by the functionality of the program, that it could not be considered 'original'.[112] In the UK decision of *Nova v Mazooma*, it was accepted that the more detailed screen displays of pool tables were 'graphic works' within the meaning of the *Copyright, Designs and Patents Act 1988* (UK).[113] Similarly, in the earlier decision of *Navitaire*,

[110] *Copyright Act 1968* (Cth) s 10(1) (definition of 'computer program'); *Dais Studio Pty Ltd v Bullet Creative Pty Ltd* (2007) 165 FCR 92, 101–8 [23]–[42].

[111] [2009] 1 Qd R 559.

[112] Ibid 582 [110]–[111].

[113] *Nova Productions Ltd v Mazooma Games Ltd* [2007] Bus LR 1032, 1037 [12] (EWCA Civ).

Pumfrey J had little trouble in holding that the graphical user interface screens in question were artistic works, as were the icons.[114]

Determining which subject matter category is appropriate may well turn on what exactly has been copied. If the act complained of were a screenshot of the map, it would be best to characterise the map as an artistic work; if the allegedly infringing act involved copying of the written information on the map, one would opt for the literary work category; and if it were the source code in issue, then computer program would be the appropriate choice. There may be only one copyright work, but identifying the relevant category of subject matter will be a strategic decision depending on the particular facts at hand.

(b) Material Form

A second problem for some kind of digital maps is the question of whether they have been reduced to 'material form'.[115] In *StatusCard Australia v Rotondo*, Chesterman J noted that there is 'a real question whether something as evanescent as a computer screen display can be a work for the purposes of the Act'.[116] He identified as important the fact that 'the information displayed on the screen is constantly changing and is not the product of the plaintiff's work'.[117] While some digital maps will likely be considered fixed works, in that they have a permanent, or semipermanent form, others are constantly updated. While map applications like Google Maps are given minor edits on what is probably a daily basis (or similar), with major edits (like redrawing country boundaries) occurring less frequently, others like OSM are subject to constant minor variations by users. Moreover, it is also important to distinguish between the less-frequently updated base map, and any overlay, such as traffic updates being streamed in real-time. Even if such maps are considered sufficiently stable for 'material form' purpose in copyright law, further issues are raised as to when the map has been sufficiently altered for it to amount to a 'new' work — thereby acquiring a new copyright term of protection.[118]

[114] *Navitaire Inc v Easyjet Airline Co Ltd* [2006] RPC 3 111, 153 [98]–[99] (EWHC Ch).

[115] *Copyright Act 1968* (Cth) s 22(1).

[116] *StatusCard Australia* (n 111) 577 [89].

[117] Ibid 578 [94].

[118] The difficulties posed by this have been noted in the analogue context: *Universal Press* (n 60) 503–4.

(c) Originality and Authorship

Following the 2009 decision of *IceTV,*[119] the question of whether a work is sufficiently original to attract copyright protection has come to turn on whether the work originates with a human author (or authors) who exercised 'independent, intellectual effort',[120] or 'sufficient effort of a literary nature'.[121] The emphasis that the courts placed on the key role of human authors in *IceTV*,[122] as well as in the subsequent cases of *Phone Directories,*[123] and *Acohs Pty Ltd v Ucorp Pty Ltd*,[124] has reopened debate about copyright protection of computer-generated works.[125] The impact of these decisions has been analysed in detail by Jani McCutcheon.[126] She observes that the mere use of software will not invalidate authorship, but that '[t]here is 'a continuum between, at one extreme, "computer-assisted" works, and at the other extreme, autonomously-generated works', where the midpoint is 'particularly problematic'.[127]

The continuum will apply in the case of digital maps. In some situations, it will be possible to identify an author who has made a sufficiently authorial contribution. An example from the United States can be found in *City of New York v GeoData Plus LLC*.[128] In this case, the Court paid particular attention to how the maps in question were made. It described the process as follows:

[119] *IceTV* (n 67).

[120] *Sands & McDougall* (n 84) 52 (Isaacs J).

[121] *Telstra Corporation Ltd v Phone Directories Co Pty Ltd* (2010) 264 ALR 617, 684 [340]. See also *Telstra Corporation Ltd v Phone Directories Co Pty Ltd* (2010) 194 FCR 142, 189 [163], 191 [173] (Yates J) ('*Phone Directories*').

[122] *IceTV* (n 67) 470–1 [22]–[26].

[123] *Phone Directories* (n 121) 171 [89]–[90] (Keane CJ), 173–4 [104] (Perram J), 181 [130] (Yates J).

[124] (2012) 201 FCR 173, 184–5 [56]–[58].

[125] See Peter Knight, 'Copyright in Databases and Computer Programs: Why Is It So Hard to Understand?' (2010) 21 *Australian Intellectual Property Journal* 118; Cameron Andrews, 'Copyright in Computer-Generated Work in Australia Post-IceTV: Time for the Commonwealth to Act' (2011) 22 *Australian Intellectual Property Journal* 29; Jani McCutcheon, 'The Vanishing Author in Computer-Generated Works: A Critical Analysis of Recent Australian Case Law' (2013) 36 *Melbourne University Law Review* 915; Jani McCutcheon, 'Curing the Authorless Void: Protecting Computer-Generated Works following *IceTV* and *Phone Directories*' (2013) 37 *Melbourne University Law Review* 46; Anne Fitzgerald and Tim Seidenspinner, 'Copyright and Computer Generated Materials: Is It Time to Reboot the Discussion about Authorship?' (2013) 3 *Victoria University Law and Justice Journal* 47.

[126] McCutcheon, 'The Vanishing Author' (n 125).

[127] Ibid 929, 931.

[128] 537 F Supp 2d 443 (ED NY, 2007).

> In creating COGIS, the predecessor to the Bytes Files, DCP programmers took paper maps from the DOF and the Borough Presidents' offices, scanned them into a computer, and manually 'traced' the outlines of the tax lots from the DOF maps. In doing so, the programmers made numerous independent decisions concerning the number and location of coordinates used to depict various shapes in the maps, such as the curved lines in tax lots. Furthermore, they made decisions concerning which features to incorporate and which to exclude.[129]

The Court later commented that the process 'involved a distinctly human element in which many independent decisions had to be made concerning how best to reflect selected shapes given the limited nature of the digitized "drawing" tool'.[130] In such a situation, the involvement of computers could be characterised as giving 'assistance' to a human author. In the words of the UK's Whitford Committee, the computer is 'a mere tool in much the same way as a slide rule'.[131] The Copyright Law Review Committee ('CLRC'), in its 1994 report on computer software protection, concluded such works could be granted copyright protection in the same way as works created using more traditional means.[132]

However, it is also possible to imagine a situation in which the translation of geographic data from the database where it is stored is carried out entirely or largely by software. *Phone Directories* suggests that where humans have been involved only at the collection stage of the geographic data, but where it is software that has made the necessary selection and transformation of that data into cartographic form, there may be an insufficient authorial role. It is also possible that the human role at the collection stage will be minimal, in the cases where data is collected by remote sensing via aircraft, drones or satellites. This had also been considered in the CLRC's report on computer software, which included amongst its examples of works not produced as a result of human labour 'programs which facilitate the presentation of financial, statistical, *meteorological* and *seismic geological* information' and 'satellite images of things such as weather patterns, vegetation, and geological formations'.[133]

If the map is considered to be a computer program rather than a literary or artistic work, then the decision in *Acohs* further indicates that programmers of any source code might also not be considered as authors of a map produced in

[129] Ibid 451.

[130] Ibid 452.

[131] Justice Whitford et al, *Copyright and Designs Law: Report of the Committee to Consider the Law on Copyright and Designs* (Cmnd 6732, 1977) 132 [514]–[515].

[132] Copyright Law Review Committee, *Computer Software Protection* (Report, 1994) [13.07].

[133] Ibid [13.01], [13.11] (emphasis added).

response to users instructing a program to produce a map of a particular area or with particular features (for example, a Google Map displaying local features of interest such as ATMs or restaurants). In that case, the Full Federal Court upheld the decision of Jessup J that neither the person who entered the data in the system, nor the programmers who wrote the routines or instruction tags could be considered authors for the purpose of copyright law. It approved Jessup J's statement that

> it would be artificial to regard the programmers as involved in the task of writing the source code for thousands of MSDSs yet to take a material form merely because they wrote, and amended, the program which, when prompted, would put together a selection of the fragments of source code which they did write with other fragments later contributed by the authors and transcribers.[134]

Even in cases where human authors have been sufficiently involved in the digital map's creation for it to be an original copyright work, further issues arise where that map is used as a 'base layer' upon which users can add additional geographic information to create a new, mashup map.[135] There are many different types of base layer maps and providers, two of the best known commercial providers being Google and Esri, which offer commercial mapping tools and services, providing access to base layers and mapping software for free, through APIs.[136] OSM is a crowdsourced mapping project which also offers street network maps for free,[137] while GeoScience Australia provides official, authoritative data, including base maps, also available for free.[138] In each case, users seeking to add to and build on these base layers do so by agreeing to certain conditions under licences. Google and Esri have their own individual end user licences, OSM requires users to agree to the Open Data Commons Open Database Licence, while Australian government bodies generally use the Creative Commons Licence CC-BY 3.0 or 4.0.[139]

134 *Acohs* (n 124) [39].

135 Saunders, Scassa and Lauriault (n 4).

136 Ibid 280.

137 Ibid. See also 'About', *OpenStreetMap* (Web Page) <www.openstreetmap.org/about>, archived at <https://perma.cc/P64F-TCDW>.

138 See 'Our History', *Geoscience Australia* (Web Page) <http://www.ga.gov.au/about/history>, archived at <https://perma.cc/KM2E-PRXK>; 'Data and Publications', *Geoscience Australia* (Web Page) <http://www.ga.gov.au/data-pubs>, archived at <https://perma.cc/FDJ6-DLJX>.

139 For example, spatial data from Australian government agencies is released through NationalMap: *NationalMap* (n 8). See also Department of Communications and the Arts (n 41) 5. The data derived from data.gov.uk is released under CC Attribution 3.0 licence but the base map is subject to the Microsoft Bing Maps Platform APIs Terms of Use: see

Untangling the interactions of different licences governing different materials is one problem for copyright users, and can prove mind-bendingly complex.[140] However, a further problem for assessing copyright subsistence in a mashup map produced via a mingling of user-provided data with proprietary base layers is whether the new work can be said to have an author, or authors, or whether authorship has become so diffuse that it no longer has any meaning in copyright terms. This is particularly the case for crowdsourced maps and volunteered geographic information. In the case of OSM, the most advanced and best known of crowdsourced mapping projects, all of the geospatial data is contributed by registered users, and authorship information is publicly available as part of the technical history, with authors — called users, but perhaps better thought of as prosumers[141] — being listed against each section of the map explaining what they have contributed and on what date. The strength of crowdsourced maps lies in the number of contributors and the checks or corrections of data that they perform. However, this creates legal problems in terms of tracing lineage as well as the proper attribution of authorship.[142] While each part of the map has an extensive record of the human authors involved in its creation, further interrogation would be necessary to ascertain whether each contribution was sufficiently significant, in terms of contribution and 'independent, intellectual effort', for that user to be considered a joint author of the finished product. For example, it would seem insufficient to add the location of an ATM, but what of the person who added in details of a national bike and horse trail?

Moreover, even if a user has added enough of their own creativity, and independent intellectual labour, for a new work to be produced, they are unlikely to be the owner of that work. Any rights they acquire will be subject to the

'Open Government License for Public Sector Information', *National Archives* (Web Page) <www.nationalarchives.gov.uk/doc/open-government-licence/version/3>, archived at <https://perma.cc/W8CE-32NW>; 'Microsoft Bing Maps Platform APIs Terms of Use', *Microsoft* (Web Page, December 2017) <www.microsoft.com/en-us/maps/product/terms>, archived at <https://perma.cc/7Y92-PEXS>.

140 See Saunders, Scassa and Lauriault (n 4) 286.

141 A prosumer is a person who both consumes and produces media. The term is attributed to futurist Alvin Toffler: see, eg, Alvin Toffler, *The Third Wave* (Bantam Books, 1980). See also David J Coleman, Yola Georgiadou and Jeff Labonte, 'Volunteered Geographic Information: The Nature and Motivation of Produsers' (2009) 4 *International Journal of Spatial Data Infrastructures Research* 332.

142 For further discussion on VGI in the Australian context, see Alister Clark, 'Where 2.0 Australia's Environment? Crowdsourcing, Volunteered Geographic Information, and Citizens Acting as Sensors for Environmental Sustainability' (2014) 3 *ISPRS International Journal of Geo-Information* 1058.

licence agreements they have entered into simply, in most cases, by starting to work with the base layer. Further complications arise when one considers who might own the underlying data, and it is this question we turn to now.

2 *The Digitised Data (or Database)*

While the digital map product presents certain problems for copyright law, potentially the more valuable product is the database containing the spatial data in question. Today, the database containing the geographic or spatial data is the product which is the most costly, laborious and time-consuming to create and which provides the essential foundation for all the products built upon it. Indeed, Crampton identifies one of the key features of digital mapping to be the 'de-emphasis on the map as end product'.[143] However, this product presents even greater problems for copyright law.

The question of whether a compilation of geographic data could be protected by statutory copyright arose as long ago as 1786, when Thomas Carnan brought a suit against Carington Bowles and Daniel Paterson, claiming they had copied a roadbook of which he was the copyright proprietor.[144] A roadbook was a list of towns and distances between them, arranged according to popular travelling routes, and containing some information about the places a traveller might pass. It was geographic data in a fairly basic form, although with some accompanying information about the locations in question.[145] There was no problem in offering statutory protection to such a work at the time because it was a 'book' and therefore protected under the *Statute of Anne*. Today, the category in Australian copyright law that would accommodate this data would be that of 'literary work'.[146]

Since the 18th century, the format and collection of geographic data has changed significantly. Where distances and directions were once calculated by a surveyor, travelling on foot with a waywiser and a theodolite, spatial data is now created using remote sensing, radar or photography and is often also collected by means ranging from satellites, aircraft and drones through to traffic cameras, mobile communication devices, wearables, in-vehicle navigation systems, credit cards, loyalty cards, social media applications and surveillance systems.[147] It can be stored in different formats — vector (meaning representations

143 Crampton, 'Digital Mapping' (n 108) 41.

144 *Carnan v Bowles* (1786) 2 Bro C 80; 29 ER 45.

145 For a detailed discussion of early roadbook cases and copyright law, see Alexander, '"Manacles upon Science"' (n 68).

146 *Copyright Act 1968* (Cth) s 10(1) (definition of 'literary work').

147 Lauriault (n 13) 95.

of the world using lines, points and polygons), raster (meaning data made up of a matrix of cells or pixels, such as a photograph), text or video.

Could a database of geospatial data, therefore, be protected by copyright as a compilation? As already noted, there seems to be a common assumption that such compilations are copyright works, particularly at the state and federal government level, where spatial databases are commonly licensed under a CC licence. However, considered more carefully there are two potential problems. First, it is debatable whether a compilation of geospatial data is protectable either because it is simply facts rather than expression, or because it lacks a human author in the copyright sense. Second, even if the compilation as a whole is a copyright work, this may not extend to the particular data contained therein, such that extraction or utilisation is not a copyright infringement if no elements of the compilation are in fact copied. In the case of a compilation, copyright protects the individual intellectual effort that goes into making the compilation, which will be the collation, selection and organisation of the data, rather than the creation of the data itself.[148]

This question has recently arisen in the United States, in ongoing litigation brought by PhantomALERT against Google and Waze in relation to GPS-based applications which PhantomALERT developed for drivers to inform them of relevant driving conditions.[149] PhantomALERT had registered both the applications' source code and its 'Points of Interest' database with the US Copyright Office in August 2015, and it alleged that Waze had copied that database. Initially, the Court dismissed PhantomALERT's claim, one of the bases being that it had not sufficiently alleged a copyright infringement claim and that the database was not protectable by copyright because it was 'inherently factual'.[150] PhantomALERT amended its claim by providing additional facts to support its case that the database was not entirely factual, including an explanation of the way it created the 'points of interest', the role played by human judgment, and the originality of its system of categorisation. The Court found that sufficient facts had been alleged to show that the database involved some creativity and was therefore entitled to copyright protection.[151] It noted that this finding was

[148] *Data Access Corporation v Powerflex Services Pty Ltd* (1999) 202 CLR 1, 35 [94]–[97] (Gleeson CJ, McHugh, Gummow and Hayne JJ); *IceTV* (n 67) 494–5 [99], 505 [139], 512 [170] (Gummow, Hayne and Heydon JJ).

[149] *PhantomALERT Inc v Google Inc*, 117 USPQ 2d 1433 (ND Cal, 2015).

[150] Ibid 1441 [26]–[27].

[151] *PhantomALERT Inc v Google Inc* (ND Cal, 15-cv-03986-JCS, 2016) slip op 15.

supported by cases which had found that maps could be protected by copyright.[152] However, the Court also found that PhantomALERT had not demonstrated a plausible inference of copying by Waze, because it had not shown that the defendants did more than merely extract factual information.[153]

Likewise, a decision of the Court of Queen's Bench of Alberta found that compilations of raw and processed seismic data was a literary work, and that seismic sections were artistic works, under the Canadian *Copyright Act*, RSC 1985, c C-42.[154] Indeed, the judge observed that the seismic sections (or, 'squiggly or zebra lines') were 'similar to a map, plan or chart'.[155] In making this finding, the court emphasised the knowledge or skill used by the seismic crew, whom it considered to be the authors of the works, in carrying out the surveys which produced or collected the data, as well as the skill and judgment that went into processing the data to create a 'usable product'.[156]

In Australia, the *Phone Directories* decision may not directly answer the question of whether a database of geographic data is a copyright compilation, as it is notable that the parties in that case were not directing their inquiries to the database in question, but rather to the directories created from the database.[157] Both Keane CJ and Perram J did, however, refer to the database obliquely. Keane CJ dismissed its relevance apparently on the basis that it merely contained facts, observing that '[t]he name and address of the subscriber does not relevantly "originate" with an employee who takes a note of these details from the subscriber. This information is factual in its nature: it is not "created" by the person who merely records it.'[158]

Perram J split the effort involved in making the directories into three phases: the Collection Phase, which involved maintaining, editing and updating a database; the Extraction Phase, which involved extracting the information from the database and sublimating it into electronic form for the directory; and the

[152] Ibid 16.

[153] Ibid 17–19.

[154] *Geophysical Service Inc v Encana Corporation* [2016] ABQB 230, [75]–[78].

[155] Ibid [76].

[156] Ibid [83].

[157] 'No claim was made for copyright in the database of the Genesis Computer System or the software which is used in its operation': *Phone Directories* (n 121) 151 [29].

[158] Ibid 163 [59].

Production Phase, which involved typesetting and physical production.[159] Having dismissed the third phase as being irrelevant to copyright,[160] Perram J focused on the Collection Phase. He conceded it involved considerable intellectual effort by humans, but that that did not count as authorial since they were not directed at the material form of the directory.[161] He explained that '*[t]he travels reduced to a touring guide*, the toils in the library underpinning a substantive work of history and the life led which finally results in an autobiography are not authorial activities however essential they might be to the creation of the work in question'.[162] This approach seems to ignore the stage between the 'travels' and the directory creation, which is where the database would fall and where Perram J conceded human effort is involved. While Telstra sought in its special leave application to direct the Court's attention to the Collection Phase, which resulted in the creation of the database, the High Court refused leave, with Gummow J commenting: 'I think your client really needs something like a database directive which you do not have at the moment.'[163]

The problem with entering into commercial arrangements upon the assumption that geospatial data is protected by copyright law is illustrated in the recent decision of the Canadian Federal Court of Appeal in *Nautical Data International Inc v C-Map USA Inc.*[164] In this case the Canadian Hydrographic Service ('CHS') entered into a licensing agreement with Nautical Data International ('NDI') pursuant to which CHS would provide data and data source materials that it had used to produce paper charts (the 'CHS Works') to NDI, which would reproduce the paper charts in digital formats.[165] The defendants copied the paper charts, or CHS Works. It was agreed that the Crown owned the copyright in the CHS Works, but the defendants alleged that NDI did not have standing to sue because the licence from CHS to NDI did not authorise them to do anything at all with respect to the CHS Works. It only authorised them to make use of the CHS data. And, as the Court pointed out, 'there can be no copyright in information'.[166] The Court went on to say:

159 Ibid 173 [102].

160 Ibid.

161 Ibid 173–4 [104].

162 Ibid 174 [104] (emphasis added).

163 Transcript of Proceedings, *Telstra Corporation Ltd v Phone Directories Co Pty Ltd* [2011] HCATrans 248, 266–7.

164 [2013] FCA 63.

165 *Nautical Data International Inc v C-Map USA Inc* [2012] FC 300, [3]–[6].

166 Ibid [11].

> NDI's statements of claim allege that the Crown 'owns' the CHS Data. That allegation presents the same ambiguity. If it is intended to mean that data can be owned in the same way as property can be owned, then there is some question as to whether it is correct as a matter of law. Generally speaking, data — mere information — cannot be 'owned' as though it were property.[167]

A final point to note briefly is that if maps and data made available on the internet are treated as copyright works, when they are copied or otherwise transmitted this may engage not just the reproduction right but also the right of communication to the public.[168] This can widen potential liability to include all those who provide the technical infrastructure that allows copyright material to be disseminated, including internet hosts of the information and those who create the software or apps that could facilitate unauthorised information sharing. These parties may be implicated as authorising infringement of either the maps or the data they contain.[169] In cases where data has been gathered from a variety of sources, under an array of licence conditions, this has the potential to generate considerable uncertainty and risk for hosting services and those who develop geospatial platforms and apps.[170]

3 *Copyright and the Digital Map: Conclusion*

It appears from the above that copyright law is not the most appropriate way of protecting digital maps. In the case of the cartographic visualisation, or map in digital format, copyright may offer protection as a computer program, literary work or artistic work, but only if a human author who has exercised intellectual effort can be identified — something that is becoming increasingly rare in the age of remote sensing and computerisation. In the case of the geospatial data, it seems unlikely that the data itself will be protected as a copyright work, despite the fact that bodies and individuals offering access to such information are treating it as such. Has this led to a gap in protection that could be filled by a database protection, as suggested by Gummow J? It is this question to which we now turn.

[167] Ibid [14].

[168] *Copyright Act 1968* (Cth) s 31(1)(a)(iv).

[169] Ibid s 36(1A).

[170] We are grateful to Professor Kathy Bowrey for this point.

III Database Right

In 1996, the European Union introduced a regime for the protection of databases in *Directive 96/9/EC*.[171] This occasioned some discussion in Australia as to the advisability of following suit, but to date no action has been taken.[172] However, the application and judicial interpretation of the *Directive 96/9/EC* over the last 11 years has highlighted some areas of uncertainty. Looking in more detail at the drafting of the *Directive 96/9/EC*, and at the cases which have interpreted it, reveals that a legislation protecting databases, at least drafted in similar terms to the directive, would not offer sufficient protection to geospatial data.

The importance of the *Directive 96/9/EC*'s definition of a protected database is plain to see, particularly following the 2015 decision in *Ryanair v PR Aviation,* in which the Court of Justice of the European Union ('CJEU') confirmed that only those databases which fulfilled the criteria set out at arts 1(2) and 7(1) of the *Directive 96/9/EC* would be granted the protection of the sui generis right.[173] To summarise, therefore, a database that may be granted sui generis protection is a database that is:

1 'a collection of independent works, data or other materials';

2 'arranged in a systematic or methodical way';

3 'individually accessible by electronic or other means'; and

4 the result of 'qualitatively and/or quantitatively a substantial investment in either the obtaining, verification or presentation of the contents' of that database.[174]

The definition of database in the *Directive 96/9/EC* has garnered considerable criticism over the years for being too broad, too ambiguous and for failing to

[171] *Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the Legal Protection of Databases* [1996] OJ L 77/20.

[172] Mark J Davison, 'Sui Generis or Too Generous: Legislative Protection of Databases, Its Implications for Australia and Some Suggestions for Reform' (1998) 21 *University of New South Wales Law Journal* 729; Sandra Gosnell, 'Database Protection Down Under: Would a "Sweaty" Australia Be Better Off with a Northerly Change?' (2003) 26 *University of New South Wales Law Journal* 639.

[173] *Ryanair Ltd v PR Aviation BV* (Court of Justice of the European Union, C-30/14, 15 January 2015) [35].

[174] *Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the Legal Protection of Databases* (n 171) arts 1.2, 7.1.

conform to understandings of the term within informatics communities.[175] Several references have been made to the CJEU for assistance in elucidating some of their elements, while others remain unconsidered. The first three criteria set out above relate to the definition of database found in art 1 and two German cases have considered them directly in relation to topographic maps. In a decision of the Regional Court of Munich (Landgericht München) of 2005, that Court held that data within a map is 'individually accessible as the user can focus on one point on the map and can determine the coordinates of that specific point'.[176]

A more recent CJEU decision, *Freistaat Bayern v Verlag Esterbauer,* considered whether topographic maps could fulfil this definition, although the Court focused only on the question of the independence of materials, in response to the question referred to it by the Bundesgerichtshof (Federal Court of Justice) ('BGH').[177] The case was filed by the Land of Bavaria which published an analogue topographical map created by the Landesamt für Vermessung und Geoinformation (Regional Office for Surveying and Geographic Information).[178] It argued that Esterbauer Verlag, a publishing house established in Austria specialising in the publication of maps, scanned and used this map without permission with the purpose of using the data to produce their own maps.[179] Whereas the Regional Court in Munich (Landgericht München) found in favour of the plaintiff,[180] the Higher Regional Court (Oberlandesgericht München) found it hard to answer the question of whether the disputed map fell under database protection.[181] Therefore, it granted leave to appeal the decision only on grounds related to the application of the provisions

[175] See Estelle Derclaye, 'What is a Database? A Critical Analysis of the Definition of a Database in the European Database Directive and Suggestions for an International Definition' (2002) 5 *Journal of World Intellectual Property* 981; Lee A Bygrave, 'The Data Difficulty in Database Protection' (2013) 35 *European Intellectual Property Review* 25; Marlena Jankowska, 'Cartographic Work as a Database after the Court of Justice Judgment of 29 October 2015' (2016) 2 *Prace z Prawa Własności Intelektualnej* 56.

[176] Janssen and Dumortier (n 4) 205.

[177] *Freistaat Bayern v Verlag Esterbauer GmbH* (Court of Justice of the European Union, C-490/14, 29 October 2015) [9].

[178] Ibid [6].

[179] Ibid [7].

[180] Landgericht München [Munich Regional Court], 7 O 18006/07 ZUM-RD 20, September 2012, 277.

[181] Oberlandesgericht München [Munich Higher Regional Court], 29U 4267/12, BeckRS, 13 June 2013 reported in (2013) 13574 GRUR, 75.

on the protection of databases. The BGH referred the matter to CJEU with the preliminary question:

> In relation to the question whether a collection of independent materials exists within the meaning of Article 1(2) of Directive 96/9 because the materials can be separated from one another without the value of their informative content being affected, is every conceivable informative value decisive or only the value which is to be determined on the basis of the purpose of the collection and having regard to the resulting typical conduct of users?[182]

To put this another way, the question asked whether data extracted from a topographic (hard-copy) map could be considered 'independent' after it had been extracted. The CJEU had earlier defined 'independent materials' as 'materials which are separable from one another without their informative, literary, artistic, musical or other value being affected'.[183] Verlag Esterbauer and the European Commission argued that the material in question was made up of two pieces of information: the 'geographical coordinates point', or numbered code corresponding to a certain coordinates point of a two-dimensional grid network; and, a 'signature', or 'numbered code used by the mapmaker to signify a unique feature, such as a church'.[184] They then argued that once the information was extracted from the topographic map, its 'informative value' was 'reduced almost to zero' because one can no longer tell where any particular feature, such as the church, is located.[185]

The CJEU disagreed. It took the position that the informational value should not be assessed by the pattern of a typical user's need, but in terms of third-party interest in the extracted material.[186] It reasoned that art 1(2) of *Directive 96/9/EC* must be understood in the sense that

> geographical information extracted from a topographic map by a third party so that that information may be used to produce and market another map retains, following its extraction, sufficient informative value to be classified as 'independent materials'" of a 'database' within the meaning of that provision.[187]

[182] *Freistaat Bayern* (n 177) [10].

[183] *Fixtures Marketing Ltd v Organismos prognostikon agonon Podosfairou AE* (Court of Justice of the European Union, C-444/02, 9 November 2004) [29] ('*Organismos*').

[184] *Freistaat Bayern* (n 177) [18].

[185] Ibid.

[186] Ibid [27].

[187] Ibid [29].

This approach can be criticised for its circularity: if the information is extracted it must have informative value and therefore be independent. It also seems that the Court was focusing on the data as part of a dataset, and not truly considering the situation of data removed from a dataset.

Even then, it is important to consider the data in question at an appropriate level of abstraction. For example, a building which appears on a map is represented as a polygon, which is in turn formed by at least five nodes (where the start and end node is counted twice). Each node contains information on its location in the form of coordinates, and tags with information about the object (eg that it is a building, the type of building, the address). The building is formed by lines joining each node. Each node contains no information value because it is not useful in isolation, and so to have any meaning it must be extracted along with other data.[188] If this is considered, then the question of whether materials are 'independent' or not may end up turning on what has been extracted, which seems to reverse the approach to deciding whether a threshold definition has been satisfied. The CJEU's decision in this case can therefore be said to provide little general guidance on how the information in maps is protected by the *Directive 96/9/EC* beyond its application in this particular case. It also gives little guidance as to which level of abstraction shall be applied in deciding the premise of 'independence' of data. Therefore, the CJEU can be criticised for neither taking the opportunity to give the interpretation of this premise nor establishing policy rules for database protection in the digital word.

Even if the definitional requirements of a database in art 1 are met, a database must also meet the criteria in art 7 of the *Directive 96/9/EC* (point 4 above) in order to gain the protection of the sui generis right. A group of four references to the CJEU sought guidance on elements of these criteria.[189] In its decisions, the CJEU drew a distinction between the investment in 'creating' data and 'obtaining and verifying' data, and confirmed that the sui generis right would only apply where the substantial investment was directed at the latter.[190] The Court also explained that investment in presentation of the database refers

[188] For more detail, see Jankowska, 'Cartographic Work as a Database after the Court of Justice Judgment of 29 October 2015' (n 175) 10–17.

[189] *Fixtures Marketing Ltd v Svenska Spel AB* (Court of Justice of the European Union, C-338/02, 9 November 2004) ('*Svenska*'); *Organismos* (n 183); *Fixtures Marketing Ltd v Oy Veikkaus Ab* (Court of Justice of the European Union, C-46/02, 9 November 2004) ('*Oy Veikkaus*'); *British Horseracing Board Ltd v William Hill Organization Ltd* (Court of Justice of the European Union, C-203/02, 9 November 2004).

[190] See *British Horseracing Board* (n 189) [28]–[42].

to the 'resources used for the purpose of giving the database its function of processing information, that is to say those used for the systematic or methodical arrangement of the materials contained in that database and the organisation of their individual accessibility'.[191]

It is not clear whether these criteria would present problems for databases of geospatial information. It has been argued that the derivation of data from naturally occurring phenomena, such as meteorological observations, is a creation of data, rather than an obtaining of it.[192] One could make a similar argument in relation to geographical, geodesic and other geo-data, namely that recording a location is to create data not obtain it. However, Sir Robin Jacob gave such arguments short shrift in the 2013 decision of *Football Dataco v Sportradar*, noting he was 'entirely confident that a scientist who takes a measurement would be astonished to be told she was creating data. She would say she is creating a record of a pre-existing fact, recording data, not creating it.'[193] In relation to the suggestion that the CJEU would consider recorded measurements as creating rather than obtaining data Sir Robin Jacob took the view that there was no prospect of that happening: 'I do not think this Directive is concerned with deep abstract aspects of informational theory or that the court would consider it to be so concerned.'[194] While this may well be the approach that the CJEU and other courts would take, it does point to the potential for problems to arise where the law that regulates a sector is expressed in terms that do not reflect the way a sector thinks about itself and its operations.

The question of what will amount to '*substantial* investment' has not received much discussion in terms of the threshold of time, effort and money that would need to be met, although the CJEU has explained that it can relate to 'human, financial or technical resources'.[195] The question of whether substantial investment has been made in obtaining, verifying or presenting data in geospatial databases could be difficult in some cases. For private companies which operate their own drones or satellites for the purpose of gathering and pro-

[191] *Svenska* (n 189) [27]; *Organismos* (n 183) [43]; *Oy Veikkaus* (n 189) [37].

[192] See Mark J Davison and P Bernt Hugenholtz, 'Football Fixtures, Horseraces and Spin-Offs: The ECJ Domesticates the Database Right' (2005) 27 *European Intellectual Property Review* 113, 115. Cf Estelle Derclaye, 'Databases "Sui Generis" Right: Should We Adopt the Spin-Off Theory?' (2004) 26 *European Intellectual Property Review* 402.

[193] *Football Dataco Ltd v Sportradar GmbH* [2013] Bus LR 837, 851 [39]; see also at 853–6 [49]–[60].

[194] Ibid 855–6 [60]. This had been suggested by Lee A Bygrave in an article the Court considered: see at 855 [59]; Bygrave (n 175).

[195] *Svenska* (n 189) [28]–[29] (emphasis added).

cessing such information, the threshold would likely be met, even if high. However, in the case of crowdsourced data, where data is gathered by users or consumers, it might be difficult to show that a substantial investment has been made in obtaining or verifying that information.

Similar questions might arise in relation to cadastral databases, where an analogy might be drawn with the British Horseracing Board's database of horse racing. In *British Horseracing Board,* investment directed at organising the races did not count as investment directed at creating the database.[196] Here considerable investment and effort goes into creating property boundaries, suburb and local government areas, road corridors and forest boundaries, but once those decisions have been made, little additional investment is needed to record them on the database, while strata plans and property surveys are created by independent surveyors and deposited in the database, with little further effort needed or made by the administration body.[197] While a database creator might then seek to rely on their investment in 'presentation', Aplin has pointed out difficulties in separating the database from the underlying software (which is not protected as a database according to art 1(3)): 'it is difficult to envisage what kind of investment could be applied to presentation of the contents in an electronic database that does not relate to the design of the underlying software'.[198]

One final problem that can be identified in relation to the provisions of the *Directive 96/9/EC* as it applies to geospatial databases relates to the term of protection that would apply in the case of a dynamic, or live-stream, database. When the data is being continually refreshed, new periods of protection would continue to arise, leading to effectively perpetual protection. The level of uncertainty that has been generated over the *Directive 96/9/EC*, both in general terms and in relation to geospatial databases, suggests that this would not be the best model for Australia to pursue if it wished to offer explicit protection to geospatial data.

IV Conclusion

Maps have long presented challenges to the law of copyright. In the mid-18th century it may have seemed appropriate to apply the model of literary copyright to maps because, like books, they were capable of being reproduced and sold by those who had not invested in their production. However, almost immediately a model founded upon authorship threw up problems for a work which,

196 *British Horseracing Board* (n 189) [38].

197 See Janssen and Dumortier (n 4) 218.

198 Tanya Aplin, 'The ECJ Elucidates the Database Right' [2005] *Intellectual Property Quarterly* 204, 214.

in the Age of Enlightenment, was increasingly presenting itself as scientific, rational and objective — and, therefore, un-authored. The model pursued from the 19th century of fitting products into categories of work is also a poor fit for paper maps, which can be characterised in different ways depending on whether one focusses on their mode of production (engraving, drawing, photography etc) or their perceived purpose or value (aesthetic, informational or functional). Even if the map is conceded to fit within the scope of copyright law such as to be capable of ownership, the question of who owns a map produced from a mix of public domain, proprietary and publicly funded materials is not an easy one to answer.

All of these problems persist in the digital age, and are compounded by uncertainty over new methods of data capture and the growing importance of the geospatial data as a separate source of commercial value. It is now the case that copyright law, as it currently stands in Australia, does not offer appropriate protection to digital maps and geospatial data. It is further argued that the situation would not be improved by introducing a database right along the lines of that adopted in the European Union. However, this is an area which needs to be addressed. It is far from satisfactory to continue to treat digital maps and geospatial data as being protected by copyright if this is not in fact the case. While the use of CC licences might have alleviated many of the concerns surrounding access to geospatial data, in particular that gathered by the state at the taxpayer's expense,[199] this is not a sufficient reason to continue the charade. Indeed, continuing to treat geospatial data as copyright runs the risk of over-protecting this material through offering it the broad and long-lasting protection of copyright, while failing to demand that it meet the threshold requirements for such protection to subsist. It is, for example, deeply unpersuasive to contend that Google Maps, updated daily, or a live stream of digital spatial data, should be protected for the life of any actual or assumed author and an additional 70 years.

Instead, one of two approaches should be adopted: either digital form maps (not created by humans) and geospatial data should be expressed clearly to fall in the public domain; or, a new sui generis right should be created which is tailored to the particular conditions in which they are created, used and disseminated. It is worth noting here that the European Commission has recently

[199] See Anne Fitzgerald, *Open Access Policies, Practices and Licensing* (n 41); Anne Fitzgerald, Neale Hooper and Brian Fitzgerald, 'Enabling Open Access to Public Sector Information with Creative Commons Licences: The Australian Experience' in Brian Fitzgerald (ed), *Access to Public Sector Information: Law, Technology and Policy* (Sydney University Press, 2010) vol 1, 71.

observed that '[t]o build the data economy, the EU needs a policy framework that enables data to be used throughout the value chain for scientific, societal and industrial purposes'.[200] One of the options that is being considered in this context is the creation of a data producer's right.[201]

It is beyond the scope of this article to explore in detail the advantages and disadvantages of either option.[202] Arguments in favour of protecting geospatial data and digital maps include: incentivising their production because of the economic and/or social value of the data itself and of products and resources generated from using it; rewarding those who have invested time, effort and expense in its production; the need to ensure integrity, quality and authoritativeness of data and data sources; and the need to recover costs or generate profits.[203] Such arguments apply to both state and non-state actors. Arguments against intellectual property rights in geospatial data emphasise public access, particularly in relation to government data sets. Proponents of open data policies point to success stories involving rapid response mapping, such as the use of OSM to create a map of streets following the 2010 Haitian earthquake,[204] or disaster stories, such as the way in which Crown copyright was said to hamper Google's efforts to display fire maps and emergency warnings in the devastating Victorian fires of 2009.[205] They might also point to new modes of data production and collection such as VGI and crowdsourcing, and the blurring of boundaries between users and creators, which do not align well with intellectual property law's traditional approaches to ownership and control.

In considering whether a new intellectual property right in spatial data should be introduced, it would be necessary to consider a number of factors. Chief amongst these are the extent to which it is necessary to provide incentives to collect, produce or analyse geospatial data and the extent to which governments, members of the public, other users and potential competitors need to

200 *Building a European Data Economy* (n 46) 18.

201 Ibid 13.

202 Marlena Jankowska proposes a change to law by introducing a new neighbouring right granting the producer a right to geo-data: see Marlena Jankowska, 'Geodata: A New Object of Intellectual Property?' (2017) 3 *Jagiellonian University Journal of IP Law* 76.

203 See David Rhind, 'Data Access, Charging and Copyright and Their Implications for Geographical Information Systems' (1992) 6 *International Journal of Geographical Information Systems* 13, 13, 17–18.

204 See, eg, Barbara S Poore and Eric B Wolf, 'Metadata Squared: Enhancing Its Usability for Volunteered Geographic Information and the Geoweb' in Daniel Sui, Sarah Elwood and Michael Goodchild (eds), *Crowdsourcing Geographic Knowledge: Volunteered Geographic Information (VGI) in Theory and Practice* (Springer, 2013) 43, 55.

205 Braue (n 40).

access and use such data.[206] It would also be important to think about the nature of the right in question (ie what exclusive rights would be granted to owners and what exceptions to such rights would be appropriate) and to define the types of spatial data to which it would apply, and the duration of any such right. A limited right, more akin to a neighbouring right such as the broadcast right, with a tailored term of protection and restricted scope, might offer a way to reconcile some of the arguments on both sides of the debate.

While some have heralded recent developments as the rise of the democratisation of information and welcomed a 'neogeography' that disrupts and devolves established, centralised structures of geographic knowledge control,[207] this new world of openness and interaction has not swept away inequalities of access and control, although it has enabled greater levels of individual participation. Rather, as Kitchin, Lauriault and Wilson point out, the new spatial media 'enrol[s] users within new markets and subjugate[s] them within new relations of control and power'.[208] It is of central importance that we recognise that the changes in technology and associated practices mean that existing legal structures are no longer appropriate, and that we engage actively in exploring new options for legal and regulatory mechanisms that reflect the new conditions and help direct government, industry and individuals towards mutually beneficial engagement and collaboration.

[206] In this respect, it is interesting to note that the Court of Queen's Bench of Alberta found that copyright can subsist in seismic data compilations: *Geophysical Service* (n 154) [75]–[78], [115]. However, it went on to find that the relevant regulatory regime's submission and public disclosure requirements for seismic exploration create a compulsory licence regime with the result that the defendants were not in breach of the *Copyright Act*, RSC 1985, c C-42 when copying seismic data.

[207] See Kitchin, Lauriault and Wilson (n 24) 13. Cf Mordechai (Muki) Haklay, 'Neogeography and the Delusion of Democratisation' (2013) 45 *Environment and Planning A* 55.

[208] Kitchin, Lauriault and Wilson (n 24) 14.