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## WHERE PEOPLE MOVE AND WHEN: TEMPORARY POPULATION MOBILITY IN AUSTRALIA

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*Nearly one million Australians (one in 20) were away from home on census night in 2006. Thus population estimates based on people's usual place of residence provide an incomplete picture. This article uses the Australian national visitor survey (NVS) to supplement these estimates and outline a picture of the seasonal undulating movement of Australians across the landscape each year.*

### INTRODUCTION

Australia's population is conventionally characterised as spatially concentrated, highly urbanised and oriented towards the coast.<sup>1</sup> Seldom acknowledged are the more ephemeral aspects of Australia's population geography, such as the annual surge of people to coastal towns during the summer months or the constant churn of temporary workers throughout the interior. Yet the magnitude of these movements is extraordinary. For instance, almost one million Australians, one person in 20, were away from their place of usual residence on the night of the 2006 census. Over the year as a whole, Australians aged 15 and over spent over 285 million nights away from home.<sup>2</sup>

This constant flux of population has diverse and far-reaching implications. It alters the demand for goods and services at both origins and destinations: for water and energy, for housing, for food and consumables, for roads and parking, for rubbish collection. It impacts on fragile ecosystems and contributes to local environmental pressures. It calls for careful, targeted planning on the part of business and service providers, such as police and health care. In some cases it can place considerable financial burdens on local communities, especially in destination regions.

Australia's official population estimates, based on a usual residence concept, are deliberately framed to exclude

visitor movements. Yet the significance of these temporary population flows and counter-flows is now widely recognised, not only in Australia<sup>3</sup> but in North America<sup>4</sup> and elsewhere.<sup>5</sup> The result is a small but rapidly growing literature concerned, not only with understanding the volume and spatial pattern of these movements, but with developing a new form of estimates that encompasses the whole of the population requiring services at any given time in a particular locality or region.

This paper aims to advance that agenda by examining the geography of temporary population mobility in Australia using data from the Australian national visitor survey (NVS). In contrast to the census, the NVS is implemented as a continuous survey, thereby providing more detailed information on the timing of population movements, as well as their spatial pattern. Despite its longstanding availability, this source of information has received surprisingly little attention outside the tourism community. Here, we use these data to explore the continually shifting feast that is temporary population mobility in Australia, focusing both on variations in intensity over time, and their changing spatial distribution. Data are resolved by purpose of trip—tourism, business, and visits to friend and relatives—to explore the reasons for the observed variations in the timing and spatial distribution of moves.

Drawing these findings together, we

then sketch a geography of temporary population mobility in Australia, as the first step in moving beyond conventional population estimates.

### **DEFINING TEMPORARY MOBILITY**

Temporary population mobility has long been part of Australia's cultural and economic landscape. While the circulation of Aboriginal Australians and of the folkloric swagmen were the early embodiments of this mobility, contemporary forms of temporary population mobility are highly varied—ranging from short-term tourist mobility, through the cross-country circuits of elderly grey nomads,<sup>6</sup> to the work-related mobility of fly-in fly-out miners.<sup>7</sup> Not everyone has a fixed abode, but common to all measures of temporary movement is the assumption that each individual has a place of usual residence.

For the purpose of this study, we define temporary population mobility to encompass those moves of at least one night in duration that do not entail a change in usual residence.<sup>8</sup> This definition is consistent with previous studies based on data from the census, although the collection procedures used for the NVS result in the exclusion of some groups.

### **DATA**

In comparison with permanent migration, temporary population mobility remains poorly served by conventional statistical collections. The NVS is a dwelling-based survey that has operated on a continual basis since 1998 and therefore provides a unique perspective on this form of movement. The survey currently samples approximately 120 000 Australians aged 15 and over (up from 80 000 in 2004) with interviewing spread throughout the year.<sup>9</sup> Respondents are questioned on their domestic travel behaviour (both day and overnight trips) over the previous four weeks with in-

formation sought on a range of topics including duration, timing and frequency of movement, the origin and destination(s) of travel, and purpose of trip. The basic unit of temporary population mobility in the NVS is the overnight trip, defined as travel involving a stay away from home for at least one night (but less than one year) at a place more than 40 kilometres from home.<sup>10</sup> The stipulation of a minimum distance excludes local moves; however, given that the median distance of temporary moves captured by the 2001 census was 126.2 kilometres<sup>11</sup> this is unlikely to result in significant distortion in the measurement of temporary population mobility.

Despite its advantages, the NVS has a number of limitations. First, because it is a dwelling-based survey, the more mobile members of Australian communities are less likely to be enumerated than are sedentary individuals.<sup>12</sup> Second, some forms of temporary mobility, such as of school students (under the age of 15) temporarily away at boarding school, or children with bi-residential living arrangements arising from parental separation, are not included in the sampling population. Third, excessive sampling variability, particularly when cross-classifying data, means it is sometimes difficult to estimate visitor numbers reliably, even at the regional level. In the work presented here, smaller and less populous regions had to be excluded from various stages of the analysis. Despite this, the results reveal new and intriguing insights into the undulating nature of Australia's population geography. The analysis is based on data from the 2005 NVS with Australian Tourism Regions adopted as the basic geographical unit (Figure 1).

### **HOW MANY TRIPS?**

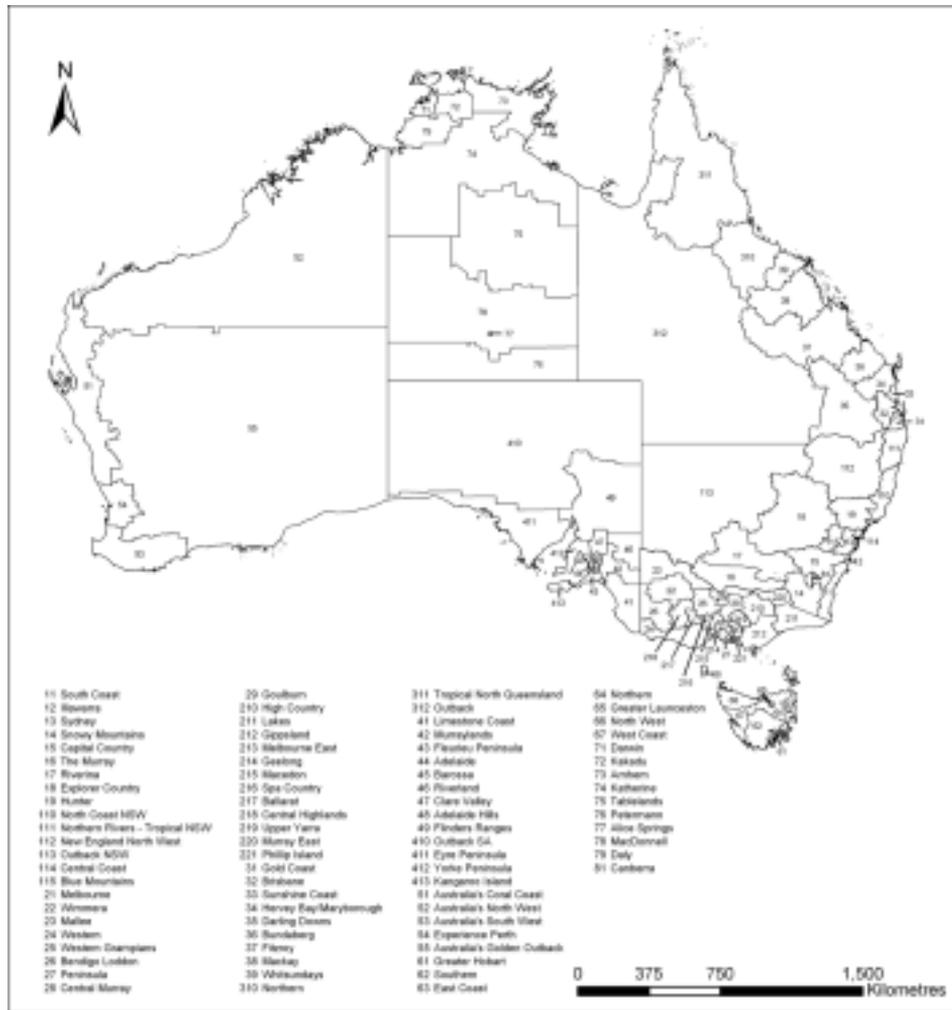
In 2005, Australians aged 15 years and over undertook some 69.9 million domestic overnight trips—equivalent to just over four

trips per person, per annum. While the annual incidence of mobility (the total number of moves per population) is recorded, the annual prevalence (the total number of people within the population who moved) is not. We do know, however, that in any given month at least 23 per cent of Australians took an overnight trip, rising to 35 per cent in January. There is also evidence of a subset of chronic movers within the Australian population: on average, 17 per cent of movers accounted for around 36 per cent of total

trips. It is unclear how these monthly prevalences translate into an annual figure—while we would expect the cumulative incidence to increase in a linear fashion, the prevalence of this mobility is likely to increase at a declining rate, as an increasing proportion of moves are undertaken by repeat movers.<sup>13</sup>

An important feature of temporary population mobility is that its intensity varies over time. In Australia, temporary mobility follows a seasonal trend, measured

**Figure 1: Australian Tourism Regions**

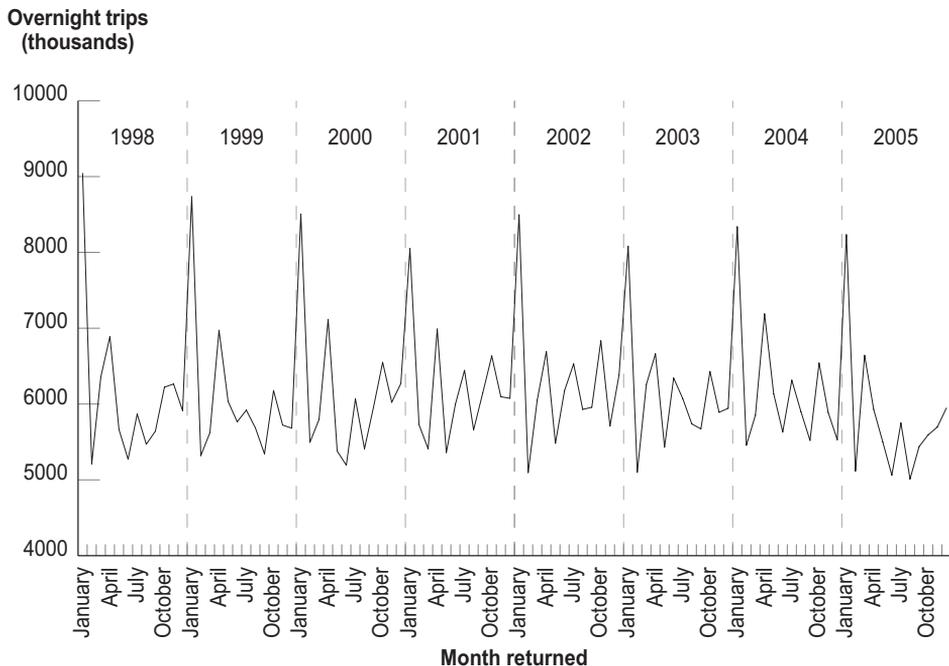


by reference to the month returned, that has remained stable since the NVS began collecting data in 1998 (Figure 2). Temporary movements tend to peak in January (12 per cent, 2005), with subsidiary peaks in March/April, and in July and October. In absolute terms there were an extra 3.2 million trips taken in January 2005 compared with August 2005, the month with the lowest number of recorded moves. The stability of the monthly pattern suggests that this variability has an inherent structure reflecting a number of factors that underpin movement across the Australian landscape. These factors may variously reflect the attractiveness of different destinations over time, or conditions at the place of origin (affecting the supply of movers) and are likely to vary according to the purpose of movement.

### WHY PEOPLE MOVE?

Temporary population movements are undertaken for a multitude of purposes—both for production, for example business travel; and for consumption, including tourism and health-related moves. The NVS collects data on trip purpose split into 17 categories ranging from visits to friends, through trips for business, to travel for health-related reasons. These are commonly distilled into four categories: tourism, visits to friends and relatives (VFR), business and other. Each of these encompasses a variety of trip activities and spatio-temporal behaviours. For example, tourism-related moves include weekends away at the beach, winter trips to alpine resorts, and cultural tourism to major cities, along with other more extended trips. Inevitably, much of this finer detail is lost through aggregation, but the broad categories share a commonality of purpose that also preserves key dimensions of spa-

**Figure 2: Overnight trips (thousands) by month returned from trip, 1998 to 2005**



Source: NVS, Tourism Research Australia

tio-temporal behaviour.

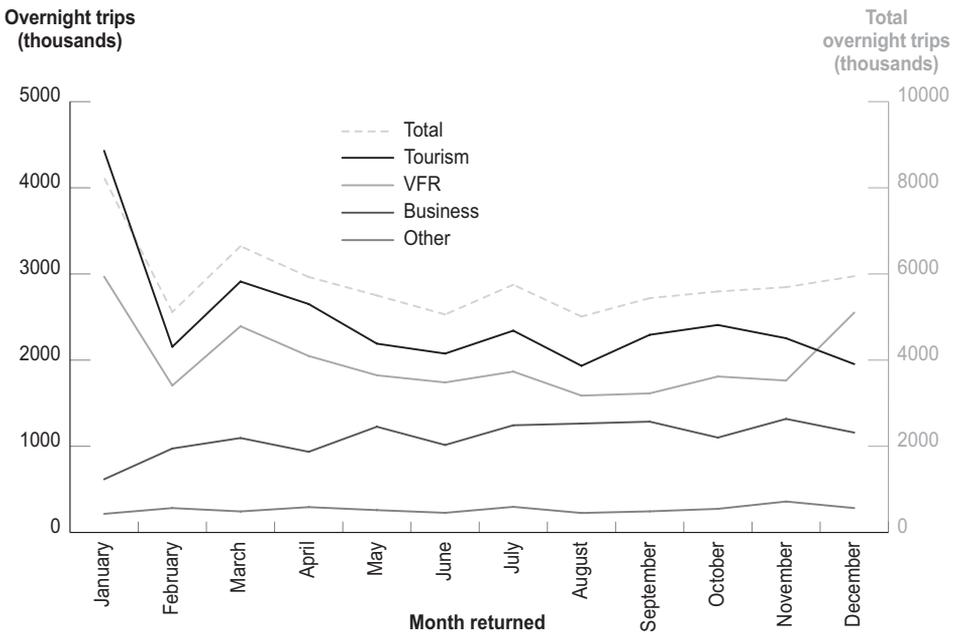
In 2005, tourism movements comprised 42.3 per cent of all overnight trips, VFR 34.1 per cent, business 18.9 per cent, and other 4.6 per cent. In Figure 3, the seasonal profile of temporary moves for 2005 is split by purpose. It is clear that tourism underlies much of the variation present in the aggregate seasonal profile. VFR mobility mimics this tourism profile with the addition of a Christmas (December) peak. Conversely, business movements—less seasonal than both tourism and VFR mobility—follow a convex profile which is at a nadir over the summer months. Other trips, including trips to access health-services and personal appointments, vary little over the course of the year.

These differences in the temporal profile of trips by purpose would be of only passing interest if the composition of temporary moves was uniform across Australian

regions. However, this is not the case—tourism constitutes a large proportion of the total visitation to many coastal regions, while work-related moves are an increasingly important economic strategy in remote and rural Australia.<sup>14</sup> Because their annual profiles vary, these compositional differences profoundly influence the seasonal profile of visitation to individual regions.

To explore spatial variations in the composition of movement by purpose to Australian regions a k-means cluster analysis was performed in SPSS 15.0, with the percentage type of travel (tourism, VFR, and business) as the clustering criterion. Trips taken for other purposes were excluded as they account for only a small percentage of all movements. Three classes of regions emerged from the cluster analysis: a class dominated by tourism flows, a class with a high proportion of VFR

**Figure 3: Overnight trips (thousands) by purpose and month returned from trip, 2005**



Source: NVS, Tourism Research Australia

movement, and a third class with an above average proportion of business moves. These are shown in Figure 4.

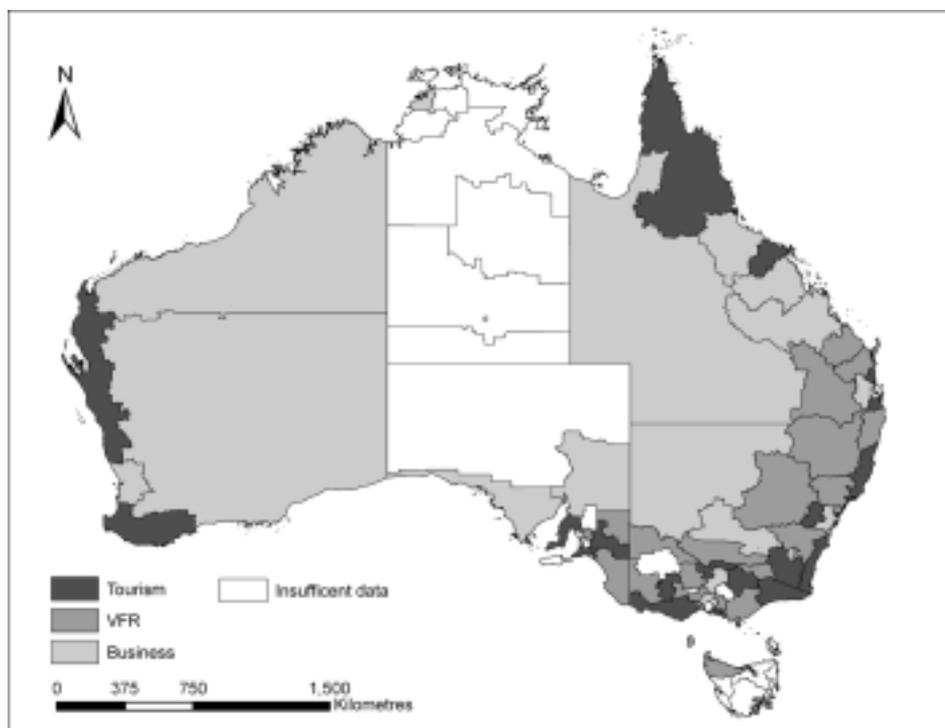
Marked spatial divisions exist between the three classes of Australian regions. Membership of the tourism class is concentrated in coastal locations and high amenity rural areas, including the alpine ski resorts of the Snowy Mountains (NSW) and High Country (Victoria); regions in the VFR class stretch in a north–south band through Queensland and New South Wales; while the business cluster is comprised of regions located across inland and northern Australia, along with all mainland state and territory capital cities. This spatial arrangement variously confirms the importance of the beach as a tourist destination, the substitution of permanent labour migration by work-related temporary movements

throughout the interior,<sup>15</sup> and the economic and urban primacy of Australian capital cities. Membership of the VFR cluster appears to reflect both historic patterns of out-migration from many parts of rural Australia,<sup>16</sup> as well as recent high levels of in-migration to high amenity rural and coastal locations.<sup>17</sup>

The significance of the observed spatial (and temporal) bias of temporary population mobility is that it points to a clear systematic structure underlying the ebbs and flows of temporary population mobility across the Australian settlement hierarchy. Building on what we know of why people move, where, and when, this offers a useful foundation on which to construct a geography of temporary population mobility, envisaged here as a mobility surface.

## POPULATION SURFACES

**Figure 4: Classes of tourism regions from k-means cluster analysis**



Source: NVS, Tourism Research Australia

Temporary population mobility is best conceived of as an undulating surface in which waves, currents and tides of movement produce a continuous ebb and flow of people across the Australian settlement system. This population surface can be imagined as stratified according to purpose, with absolute and relative changes in the size of the respective layers producing the undulations visible at the surface. These can vary in size from minor peaks in visitor numbers to periodic surges threatening to overwhelm host communities. While data and cartographic issues limit our ability to represent this complex image, we can deduce some aspects by examining a series of snapshots of this surface, and relating these to the temporal and spatial signatures of different purposes of movement.

Figures 5 to 8 reflect the population surface at four points during 2005, using in-movement rates standardised by population at the destination zone. The population surface in January 2005 (Figure 5) is characterised by high rates of movement to regions in southern and coastal Australia. The seasonal profile of temporary movements (Figure 2) implies that visitor numbers to these regions are primarily tourism-driven. Support for this is provided by the earlier analysis of movement trip composition (Figure 3) which reveals a strong spatial bias in tourism movements towards southern and coastal parts of Australia. High rates of in-movement were also recorded in a number of regions composed primarily of VFR flows—which also peak in January—however, not all regions were uniformly affected. This is perhaps due to the amplification of in-migration rates in regions where surges in tourism and VFR movement occur simultaneously.

The corollaries of high-rates of in-migration to southern and coastal regions in January are low rates of in-migration to large swathes of inland Australia. This

trough in visitation is the product of a number of factors, including the hostile climatic conditions (detering tourism-related mobility), the higher relative attractiveness of coastal regions at this time and the low incidence of business-related moves which comprise a significant percentage of mobility to many parts of inland Australia (Figure 4).

By April (Figure 6), the surge of movement to southern and coastal areas has subsided, reflecting the overall decline in the total number of movers (Figure 2) and this is accompanied by increased flows to inland Australia. The rate of visitation to most inland regions by this time has risen to match that in many coastal areas. The exceptions are regions close to capital cities and along the New South Wales/Victorian border, which record persistently high rates of mobility. These localised peaks in mobility are likely to be caused by tourism and VFR mobility tied to the Easter period. The net effect at this time is an overall evening out of the population surface across the continent.

Further flattening of the population surface is evident in July 2005 (Figure 7), reflecting lower levels of temporary mobility, and greater balance in trip composition, as the incidence of tourism-related mobility declines relative to business and VFR movements. Tracking the different strata of movement at this time is difficult, but a slight northward drift of tourism-related movement, including groups such as grey nomads, appears to accompany the circulation of business movers throughout the north and inland.

The October snapshot (Figure 8) shows a resurgence of localised peaks in visitor numbers in several distinctive regions including the Whitsundays (Qld), the Snowy Mountains (NSW) and High Country (Vic), along with other isolated localities in Victoria and South Australia.

Movements here are probably dominated by tourism-related flows and, in the case of the Snowy Mountains and High Country, by both work-related and tourist movements connected to the alpine ski season. Smaller surges in visitation across parts of northern and inland Australia are a product of work-related moves as well as of high volume tourism flows attracted by the more amenable climatic conditions.

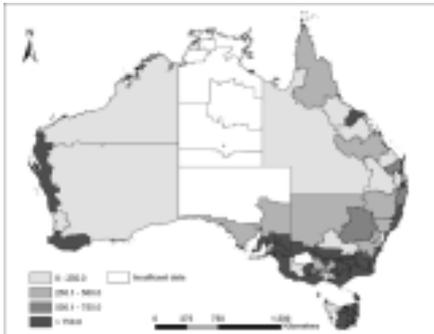
The endpoint of this annual undulation is the retreat of visitors from inland and northern Australia with the onset of the wet season in the north, and the hotter weather in the south. Simultaneously, the temporal rhythm across Australia slows with the approach of summer, causing work-related mobility to lessen in intensity. VFR mobility again increases with many individuals

returning home for Christmas, and finally the annual migration to the beach begins again—producing a population surface perhaps more closely aligned to Australia’s national psyche than is reflected in the country’s permanent settlement pattern.

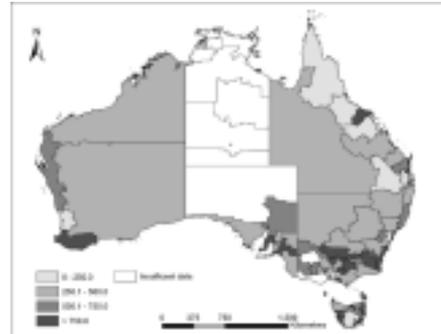
### CONCLUSION

The temporary population surface described in this paper is an attempt to sketch an important, yet previously undefined, aspect of Australia’s population geography. While the impact of temporary population mobility for the planning and provision of services is well recognised, little is understood about the temporal and spatial structure of this mobility. This neglect can be traced, in part, to the move by many National Statistics Agencies to a usual-resident framework for

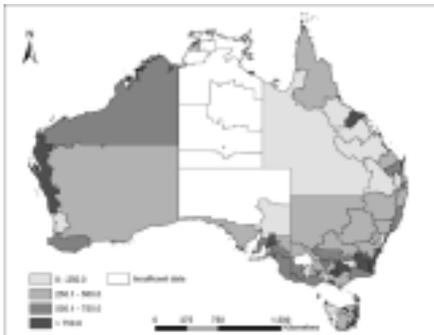
**Figure 5: In-movement rates, January, 2005**



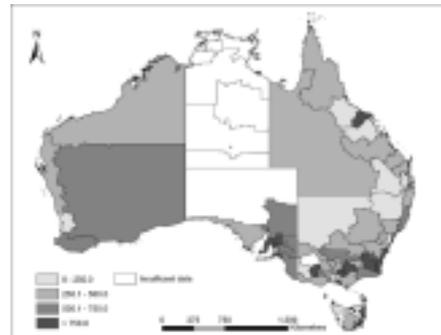
**Figure 6: In-movement rates, April, 2005**



**Figure 7: In-movement rates, July, 2005**



**Figure 8: In-movement rates, October, 2005**



Source: NVS, Tourism Research Australia

population statistics. While this is consistent with international best practice, the outcome has been an almost exclusive concern with where people live, not with where people are. To meet the demand for estimates created by rising levels of temporary population mobility we need to return to some form of de facto enumeration of population.

It is clear from the analysis presented here that this is a demanding agenda. The undulating population surface produced by various streams of temporary movers is complex and in a constant state of flux. While identifiable patterns in space and time are present, for example the January surge to the coast comprised of holiday makers, the temporal and spatial resolutions available in aggregate data sets are too coarse to identify much detail. What does

emerge, however, is a sense of the overall structure of the temporary population mobility surface in Australia and it is this that may hold the key to the development of small-area temporary population estimates. Complete enumeration of the temporary population surface is a remote possibility, especially given concerns over data privacy. A more promising approach may be to supplement sample profiles of temporary populations with synthetic data, especially in regions for which comprehensive information is unavailable. This approach calls for a robust understanding of the ways in which temporary populations are constructed by the various ebbs and flows of movement that comprise Australia's undulating population surface, a goal to which this paper has sought to contribute.

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