Another Snapshot for the Album: A Decade of Australian Archaeology in Profile Survey Data

Geraldine Mate[a,b] and Sean Ulm[b]

a Cultures and Histories Program, Queensland Museum Network, South Brisbane, QLD, Australia

b College of Arts, Society and Education, James Cook University, Cairns, QLD, Australia

Abstract

A comprehensive survey of Australian professional archaeologists undertaken in 2015 is used to explore key aspects and emerging trends in the state of the archaeological profession in Australia. Comparisons are made with data collected using the same survey instrument in 2005 and 2010 to allow consideration of longer-term disciplinary trends related to working conditions, changing participation and access, trends in qualifications and workplace confidence and re-evaluating skills gaps identified in previous surveys. Substantial changes in the archaeological workplace are identifiable with deterioration in employment conditions and an increasingly casualised workforce, contrasting with a growth in professionalisation observed through an increasingly qualified workforce. Restructuring of the discipline observed in previous surveys, showing increases in Indigenous archaeology and a corresponding decrease in other subfields, are less pronounced. Survey data demonstrate the Australian archaeological workforce to be a highly qualified discipline by world standards but also a discipline that is being reshaped by downsizing of government regulation of heritage issues and volatility in the private sector related to external economic factors.

Introduction

Since the last Profiling the Profession survey in 2010, there have been large-scale changes in archaeological workplaces across Australia, closely linked with changing commodity prices (especially iron ore and coal) and a general slow-down in economic activity subsequent to the 2008 global financial crisis. Some of the largest companies in consulting archaeology have faltered (Evans 2015) or significantly down-scaled. Anecdotal evidence suggests varied individual responses to these changes, ranging from people returning to postgraduate study or leaving the profession altogether.

In this third iteration of the Profiling the Profession survey series we explore a range of quantitative and qualitative data to describe and evaluate changes in the professional landscape. The data provided allow insights into the way archaeology conducted in and from Australia is changing. Comparisons with international data and previous surveys are beginning to allow longitudinal trends to be assessed.

Methods

The Australian Archaeology in Profile 2015: A Survey of Working Archaeologists (also known as the Profiling the Profession survey) was carried out under the auspices of the Australian National Committee for Archaeology Teaching and Learning (ANCATL), which includes representatives from Australian universities teaching archaeology, professional associations, Indigenous groups, industry groups and public sector employers. The survey adds to data acquired in 2005 (Ulm et al. 2005) and 2010 (Ulm et al. 2013). While the 2005 survey was originally conceived of as a benchmarking tool (Ulm et al. 2005: 11, 22), the ongoing survey allows longitudinal analysis. The original survey architecture drew on similar approaches used in the United Kingdom (Aitchison and Edwards 2003, 2008) and United States (Association Research Inc. 2005; Zeder 1997). Subsequent surveys have built on these and other surveys (Aitchison and Rocks-Macqueen 2013; Aitchison et al. 2014; Smith and Burke 2006) and have also been further modified to reflect the different shape of the profession in Australia.

The survey instrument comprised four sections: demographic profile (20 questions); employment information (14 questions); professional activities (12 questions); and learning and training issues (4 questions), as well as an open comments field. The full survey instrument is included in the Supplementary Material as Appendix S1. As the aim of the survey was to build a profile of professional archaeology in Australia, eligibility to complete the survey was limited to anyone who:

- used archaeological skills in *paid* employment during the calendar year preceding the survey (i.e. 2014); and,
- worked in Australia, or was based in Australia and worked overseas.

In the 2015 survey additional questions were included on workplace employment tenure, recent workplace changes and the nature of volunteer work. A call for submissions on the survey instrument was made to stakeholders in the survey, the result of which was the inclusion of five additional workplace skills to questions on skills valued and experience: dating techniques, remote sensing, computer modelling and simulation, ancient DNA analysis and isotope analysis. Two additional salary brackets were also added to the question on income to provide finer-grained detail on higher salary brackets ('$170,000 or greater' was further divided to '$170,000–$180,000'; '$180,000–$190,000'; and '$190,000 or greater'). The final survey was vetted and tested by members of ANCATL prior to the survey being released.

With the cooperation of the major archaeological associations in Australia, the online survey was distributed using the social media channels of the Australian Archaeological Association (AAA), Australasian Society for Historical Archaeology (ASHA), Australasian Institute for Maritime Archaeology (AIMA) and Australian Association of Consulting Archaeologists Inc. (AACAI). In addition, the survey was widely promoted on major archaeology list-servers and social media platforms.

SurveyMonkey® was used to gather survey responses in 2010 and 2015, providing ease of distribution and access nationally (and internationally where necessary). Use of an online survey tool does however have the potential to create inherent biases in the type of respondents, as outlined in Evans and Mathur (2005:201). For example, people with limited computer literacy may disengage with the survey, particularly given the length of the questionnaire. As computer literacy was one of the higher ranked skills in the results (see below), this is unlikely to have had a profound impact on skewing the distribution of respondents.

In Australia, the field-based nature of archaeological work combined with a proportion carried out in remote locations with limited or no internet access may also have had an impact on response rates from people undertaking prolonged or regular remote fieldwork. While the survey period ran from 3 March–3 May 2016, this may still have excluded archaeologists in the field at this time. Anecdotally, we received several personal emails from colleagues with apologies for inability to complete the survey due to fieldwork commitments.

Results

The survey covers many facets of the profession, and in the following analysis we focus on access and participation rates, the archaeological workplace, qualifications and experience, and skill sets and skill gaps. Results from 2015 are presented with, where appropriate, comparisons drawn with the 2005 and 2010 surveys and the findings of previous Australian studies and some overseas surveys.

There is a continuing trend of strong response rates for surveys. The 2015 survey received 358 responses. Three responses were excised as they did not meet the criteria of earned money in 2014. Overall the final number of responses (n=355) was in line with the strong response rates received in previous surveys (2005 n=301; 2010 n=399; also see Table 1).

As has previously been reported for the 2005 and 2010 surveys, the responses again included a range of qualitative comments (4210 words), this time mostly focused on the state of the market, quality of product in the discipline, use of volunteers and graduate skill levels and needs.

Table 1 Survey response rates versus estimated number of archaeologists, 2005–2015.

Survey Year	# Responses	Estimated No. of Working Archaeologists in Australia	Response Rate*
2005	301	~ 600	50.00%
2010	399	500–600	66.50%
2015	355	735	48.30%

* Percentage Response rate based on estimated size of profession.

Access and Participation

Anecdotally, the size of the archaeological profession has been volatile over the last 10 years, with perceived impacts from the global financial crisis, the downturn in the mining sector in Australia and changing legislative imperatives for archaeological work. In past surveys the ordinary membership base of peak associations (AAA, ASHA, AACAI and AIMA) was used as a basis for estimation of the total population of working archaeologists. This approach requires adjustment for the large proportion of avocational and student members of AAA, ASHA and AIMA who may not be working in the discipline and are therefore ineligible to complete the survey. In the 2010 survey, it was estimated that the under-representation of the archaeological population in the survey was between 25 and 50% (Ulm et al. 2013:35). This was based on extrapolating from an indicative response percentage calculated using the number of respondents based in academia for the survey year (2009) in comparison with Smith and Burke's (2006) estimate of academics in archaeology.

For the 2014 census period estimates of the profession have been further refined. Association membership has once again been used as the basis for the estimated population with the combined membership of the four peak associations calculated at 894 members (including 499 members of AAA, the largest association). This number was then adjusted proportionally using information from the survey. In particular adjustments took into account (i) the proportion of respondents typically not members of the four main associations, and (ii) any overstatement of population based on multiple association memberships, reducing the total estimate to 735. Despite anecdotal claims of continued tightening of employment prospects and a reduction in the size of the discipline as a result of economic and legislative contexts, the estimated number of archaeologists in Australia has increased by approximately 22.5% since 2010. Confidence in the sector also seems to be improving (see 'Archaeological Workplace'), despite responses to the contrary in free text answers.

It should also be noted that regular membership of the archaeological associations does not necessarily equate with qualification for the survey. Members may not have earned a salary in archaeology in the census year, may be retired but not self-identifying as a concessional member, or may have earned a salary in a job

which they did not regard as using their archaeological skills. Thus the calculated response rate may be artificially low due to a potential over-estimation of the gross number of *working* archaeologists.

Given this is the third survey in 10 years, a lower rate of response may also be attributable to survey fatigue, not just for this survey but as a result of the increasing number of online survey requests received electronically. The survey also is relatively lengthy and some respondents may have chosen not to participate this time round.

Based on an estimated total working population of 735 people, our sample of 355 respondents will give an estimated error margin of ±3.74% and a confidence level of 99% (after Raosoft 2004).

In addition to consideration of response rate, a number of other factors in participation can be explored in more depth through the demographic information, including age, gender and cultural background, most particularly indigeneity.

Age profile

Following on from observations in the 2005 and 2010 surveys, the trend towards a younger discipline continues, with 67.3% of respondents aged 45 years old or younger (Figure 1). This represents a substantial increase in the proportion of under 45s in the discipline, with an increase of 5.6% on 2010 (61.7%) and a 10% change over the last 10 years (57.2% in 2005). With an apparently growing discipline, based on estimated numbers in the profession, an increase in the net number of respondents of 45 and under is to be expected, however the growing *proportion* of those 45 and under indicates a changing demographic across the sector.

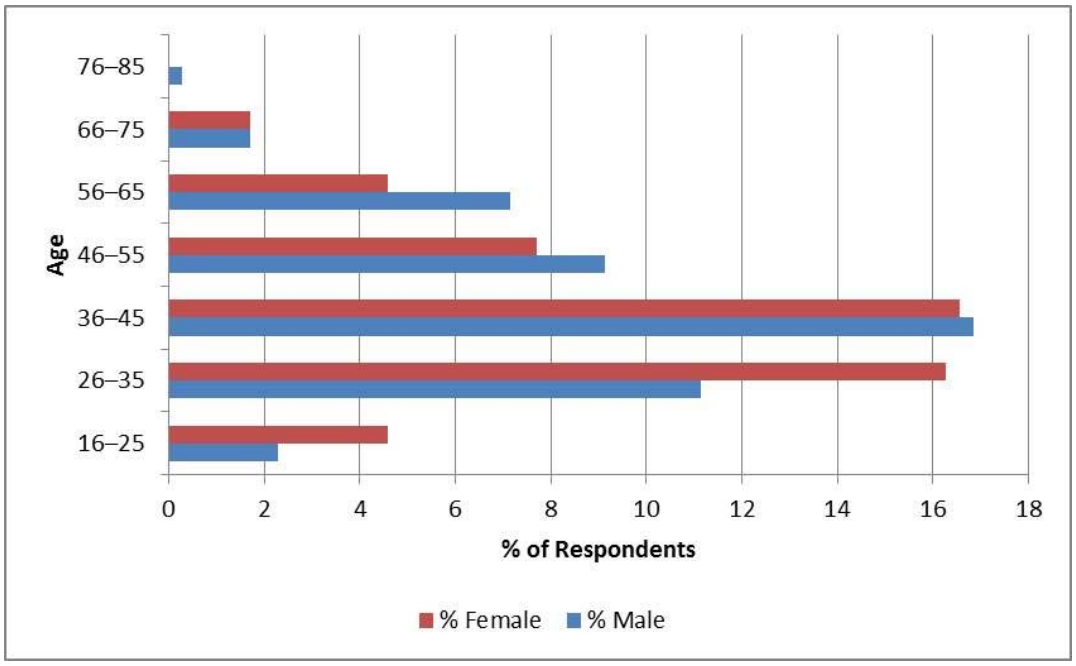

Figure 1 Respondents by age and gender (n=350). Note that the number of respondents indicated on graphs does not always equal the maximum number of respondents to the survey (n=355) as some questions were left unanswered or a subset of data is employed.

University participation rates in Australia have grown dramatically over the last 25 years, with domestic students increasing from 400,000 in 1988 to 1,000,000 in 2013, aided by easing in caps on undergraduate enrolments over the last five years (Norton and Cherastidtham 2014:20–21). Over an extended period Arts students have comprised ca 30% of all enrolments (Norton and Cherastidtham 2014:23). To give an indication of these trends specific to archaeology, single degree archaeology programme enrolments at La Trobe University expanded from 118 in 2006 to 190 in 2010 and at Flinders University from 112 to 131 in the same time period (Gannaway and Sheppard 2012:Table 1). Growth in the discipline, with new positions filled through an uptake in graduates, may account for the high proportion of under 45s.

The average age of practitioners may also be influenced by a trend towards early, with recent retirees (in the last five years) having an average age of 61.5 (ABS 2014), the physical nature of archaeological fieldwork may impact on a tendency to early retirement in the discipline.

The average working age of men and women in the sector is somewhat variable but has nevertheless shown some difference; the average age of women has fallen by two years in the last 10 years while the average age of men has increased marginally overall following a large jump in the 2010 survey (Table 2). This accords with the higher representation of women in the age brackets below 36. In Britain, this trend appears to differ with a steady rise in the average age for both men and women over the last 15 years (Aitchinson and Rocks-Macqueen 2013:95). However, the average age for British archaeologists can be seen as comparative to those of Australia with results in Britain indicating the average age of men at 44, women at 39 and an overall average age of 42.

Table 2 Average age of respondents in all three surveys, using census year.

Year	2004	2009	2014
Men	42.5	44.3	42.9
Women	41.4	39.2	39.3
Overall Average Age	42	41.6	41

Gender Participation

Gender participation figures show a continued trend of more women in the sector than men (2.8% difference). There are proportionally more women in the archaeological workplace than men (female 51.4% vs male 48.6%), continuing the trend observed in 2010 (Figure 2). While this difference is less pronounced than that observed in 2010 (female 53% vs male 47%), it is still in direct contrast to other countries, for example Britain, where the proportional prevalence is inverted (male 54% vs female 46%) (Aitchinson and Rocks-Macqueen 2013:93), or the United States, where approximate figures indicate 60% male vs 40% female participation (Altschul and Patterson 2010). Aitchinson and Rocks-Macqueen (2013:97) suggested that gender parity will be reached in the UK by around 2017–18.

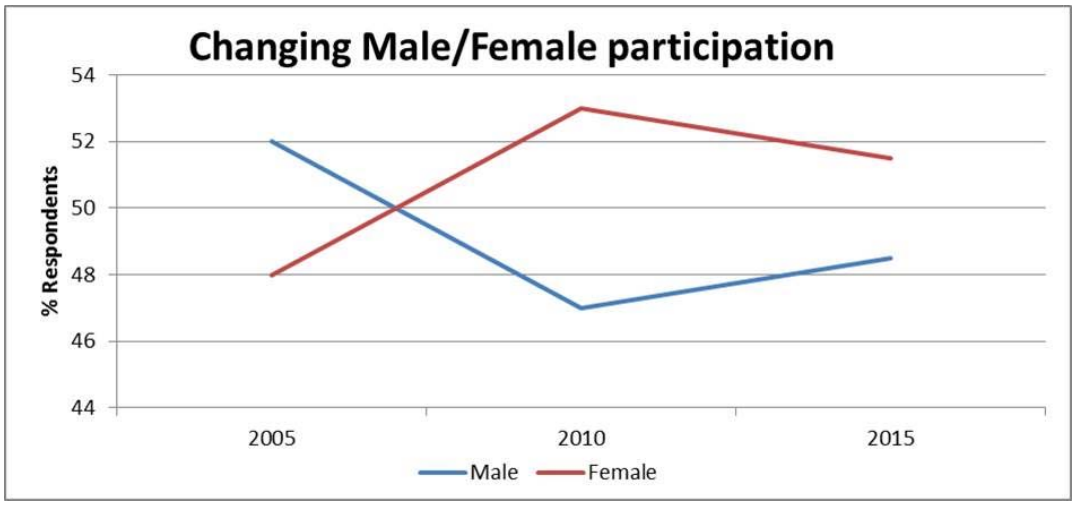

Figure 2 Changing proportion of males and females participating in Australian archaeology through time, 2005–2015.

The overall proportion of women in Australia is particularly influenced by their larger representation in the younger age groups; concomitantly there are more men in the profession aged 36 and older (Figure 1). This distribution reflects the changing demographic of the profession over the last 20 years, presupposed on observable differences in the female / male proportions in university courses in archaeology, and impacts the average age of men and women in the discipline, most pronounced in 2010 results. The lower average age of women could also be influenced by other lifestyle factors such as women leaving the workforce / profession with family responsibilities or to pursue careers outside of archaeology that provide a different work-life balance.

Indigenous and International Participation

Indigenous participation rates in professional archaeology as reported by previous surveys have appeared changeable over the last 10 years. In 2015, 2.8% of respondents identified as Indigenous. In comparison in 2010, 0.8% of respondents identified as Indigenous and in 2005 2.3% of respondents. The 2010 survey results are thought to represent the impact of low participation rates for the survey by Indigenous respondents, rather than a reduction in involvement in the sector (Ulm et al 2013:5). While the number of respondents in the 2015 survey appear to reflect the proportion of Aboriginal and Torres Strait Islander people in the broader Australian population (ABS 2011), it still appears to under-represent participation of Indigenous archaeologists in the survey. Based on an informal estimate of Indigenous archaeologists active in Australia (>20, see Perry 2010), the number of respondents (n=10) reflects proportionally fewer respondents than the overall response rate of 48.3% across the discipline.

The proportion of overseas-born archaeologists has continued to decline over the last five years (Table 3 and Figure 3). In previous surveys overseas born archaeologists dominated some age groups, particularly in the older age ranges. However in the 2015 survey, for the first time, Australian-born archaeologists are predominant in all age groups. This appears to be a result of older (predominantly British-born) archaeologists retiring. In the younger age groups, Australian-born archaeologists far exceed non-Australian born. Nevertheless, this proportion still shows a high level of imported expertise. In comparison, Aitchinson and Rocks-Macqueen (2013:100) reported only 7% of archaeologists practicing in Britain as being from outside the UK.

Table 3 Proportion of overseas born archaeologists working in Australia.

Year	% Overseas Born Archaeologists
2005	32.1
2010	28.3
2015	24.1

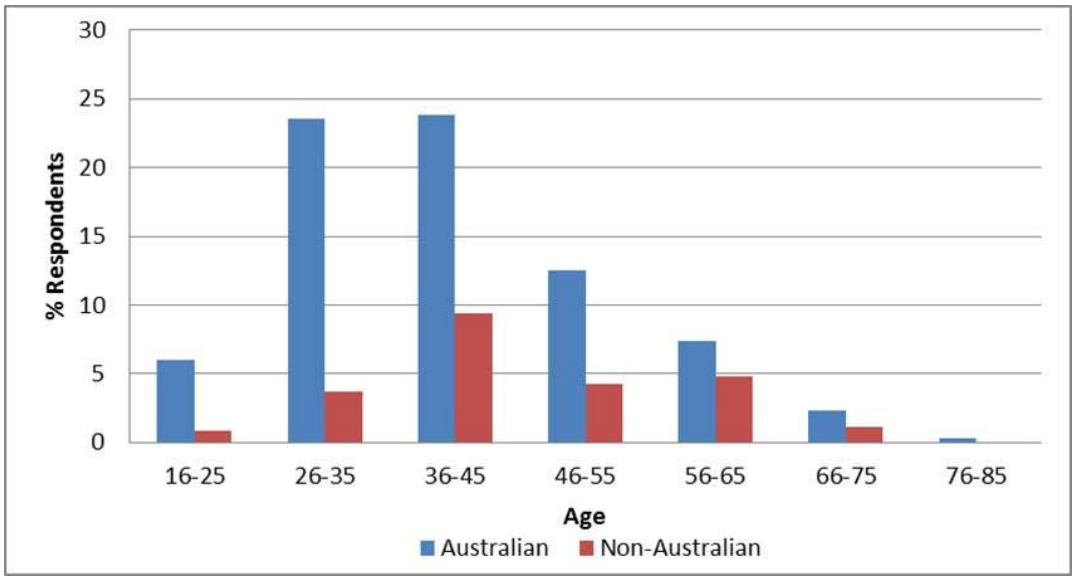

Figure 3 Age profile for Australian vs non-Australian archaeologists in 2015 (n=352).

The Archaeological Workplace

While archaeologists are employed across Australia, the majority are employed on the eastern seaboard (Vic, NSW, Qld and ACT accounting for where 71% of respondents work and where 74.2 % of respondents are based), with WA the fourth biggest population, having 15% of respondents based there (Figure 4). The proportion of archaeologists in the east has, however, fallen in comparison to past surveys (75.9% in 2005, 75.4% in 2010 and 74.2% in 2015 – Table 4). Analysis shows a divergence in the field in which archaeologists are employed, with stark contrasts in different the states. A larger proportion of NSW and Vic archaeologists work in historical archaeology, while in Qld and WA, those working in Indigenous archaeology predominate. The greater representation of historical archaeologists in NSW and Vic may be related to heritage legislation which prescribes mitigative actions and also infrastructure development, while the greater representation of Indigenous archaeology practitioners in QLD and WA reflect those states' focus on the resource sector. Overall the vast majority of archaeologists are still based in capital cities (72% – down from 78% in 2010 and 75% in 2005) or regional centres (19% – up from 14% in 2010 and 17% in 2005). There is a continued small but sustained drift to regional, and rural areas with 7% of respondents based rurally (up from 6% in 2010 and 5% in 2005) and away from remote areas (2% in 2015, unchanged from 2010 and down from 3% in 2005).

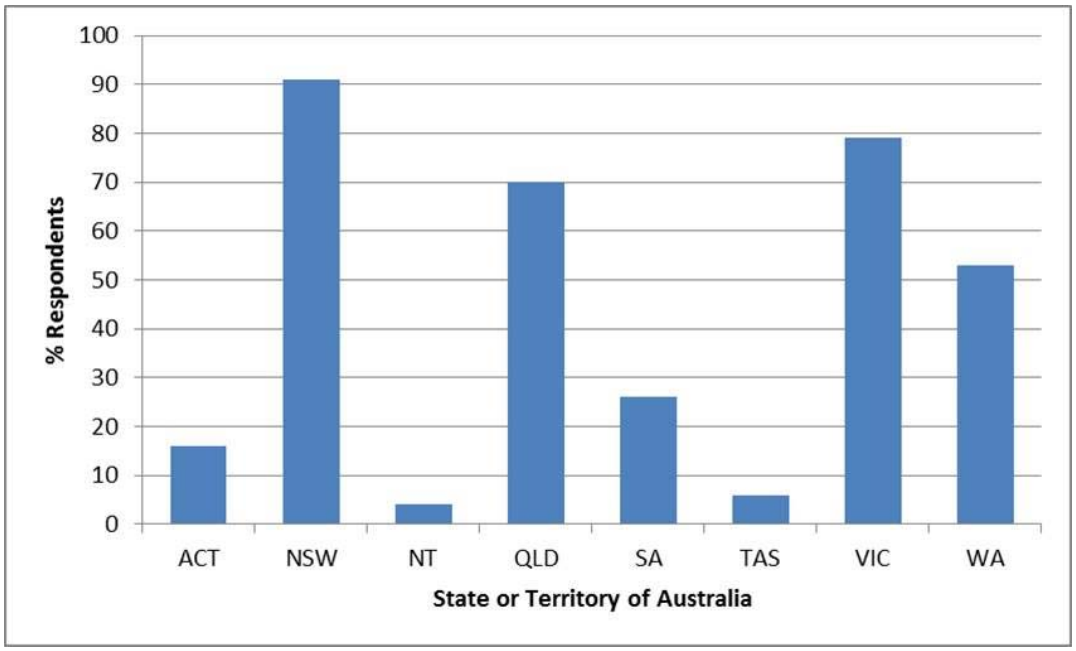

Figure 4 Respondents based in Australia by State and Territory (n=345).

Table 4 State and Territory of Australia where respondents are based, changes through time.

State	2005	2010	2015
ACT	6.8	6.4	4.6
NSW	37.3	31.3	26.4
NT	2	1.5	1.2
QLD	17.8	15.1	20.3
SA	9	6.2	7.5
TAS	4.1	2.3	1.7
VIC	14	22.6	22.9
WA	9.2	14.6	15.4

Over the discipline as a whole, 63.9% of all respondents identified Indigenous archaeology as their primary subject focus (Figure 5). This has fallen slightly since 2010 when 66.4% of respondents worked primarily in Indigenous archaeology. A further 16% of respondents active in other subject foci indicated they were also active in Indigenous archaeology, representing in total 80% of the discipline. The reduction in respondents active in Indigenous archaeology is matched with an increase in those primarily active in historical archaeology, moving from 19% in 2010 to 23% in 2015. Overall, slightly more men than women primarily work in Indigenous archaeology while in historical archaeology there are proportionally more women. Once again, classical archaeology appears to be under-represented as only six respondents identified this as their primary subject focus. There may be a number of factors influencing this relatively small sample. Given a further 17 respondents reported working in this area some of the time, it may be more illustrative of the range of work and multidisciplinary focus of archaeologists working in the classics rather than an under-representation. It could also be a reflection on the need to work in other fields as a result of a lack of opportunities in the field of classical archaeology in Australia, or even an artefact of which associations classical archaeologists belong to, impacting awareness of the survey.

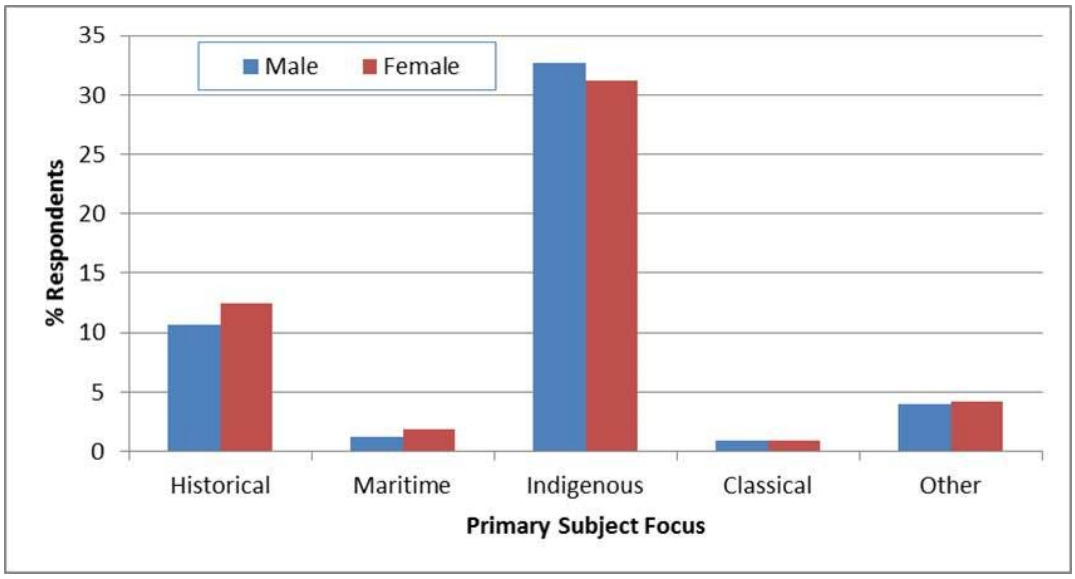

Figure 5 Distribution of respondents by primary subject focus and gender (n=330).

Respondents across all these subfields engaged in Cultural Heritage Management (CHM) activities, with 61% of all respondents reporting that they spent at least half of their time undertaking such work. Comparative data from 2010 (59%) indicate a slight upward trend. This trend correlates with perceived workplace confidence across the sector based on expectations of changing employee numbers seen in Figure 6, with 64.7% of respondents expecting the workforce to maintain current numbers or increase archaeological staff in the coming year. This contrasts with the data from the survey year, which saw 74.1% of respondents in a workplace that remained the same or contracted. The perceived workplace confidence is nevertheless down in comparison the figures in 2010 which saw 71% of respondents expecting their workplace to maintain current numbers or expand. In contrast to the sector as a whole in 2015, in the private sector respondents showed a pronounced lack of confidence, with 70.2% of respondents expecting the coming year to see no change or a reduction in the number of archaeological staff. This is despite the private sector respondents reporting a smaller reduction in staff during the survey year (70.2 % the same or less) than the sector as a whole.

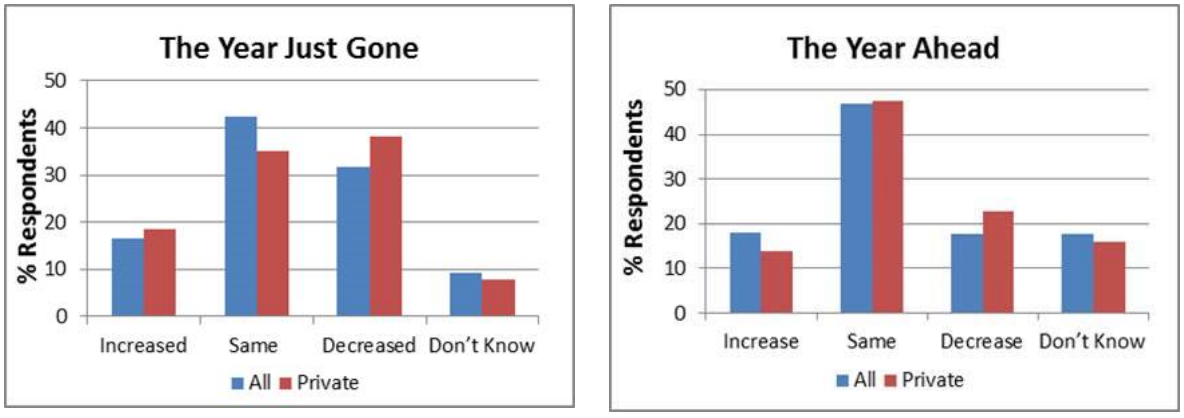

Figure 6 a) Changes in workforce numbers for 2014; b) Expected change in workforce for coming year.

As foregrounded in the 2010 survey (Ulm et al. 2013:37), the private sector ('consulting'), provides the main employment opportunity for archaeologists in Australia. In 2015, 55% of respondents were employed in the private sector, continuing the strong upward trend seen in 2010 (52%) from 2005 (47.9%) in contrast to results for workplace confidence (Figures 7 and 8). The next biggest employers are universities (24%, down from 25.3% in 2010) and government (12%, trending substantially down from 15.9% in 2010 and 22.7% in 2005) (Figure 7). These data highlight the ongoing trend across the last decade of growth in the private sector, a reduction or stasis in the university and museum sectors, and substantial downsizing of cultural heritage functions of government agencies. The trend in government employment reflects changing policy and employment security across both federal and state government. Local government employment appears to be more volatile based on changes between 2005 (1.7%), 2010 (0.5%) and 2015 (1.4%), but is also proportionally a very small element of government employment.

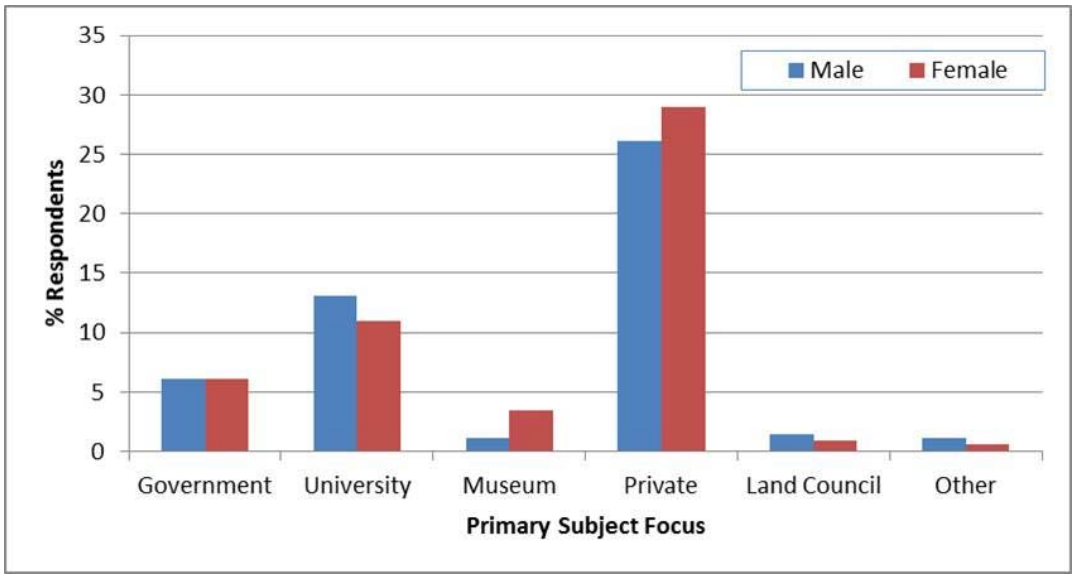

Figure 7 Distribution of respondents by primary employer and gender (n=345).

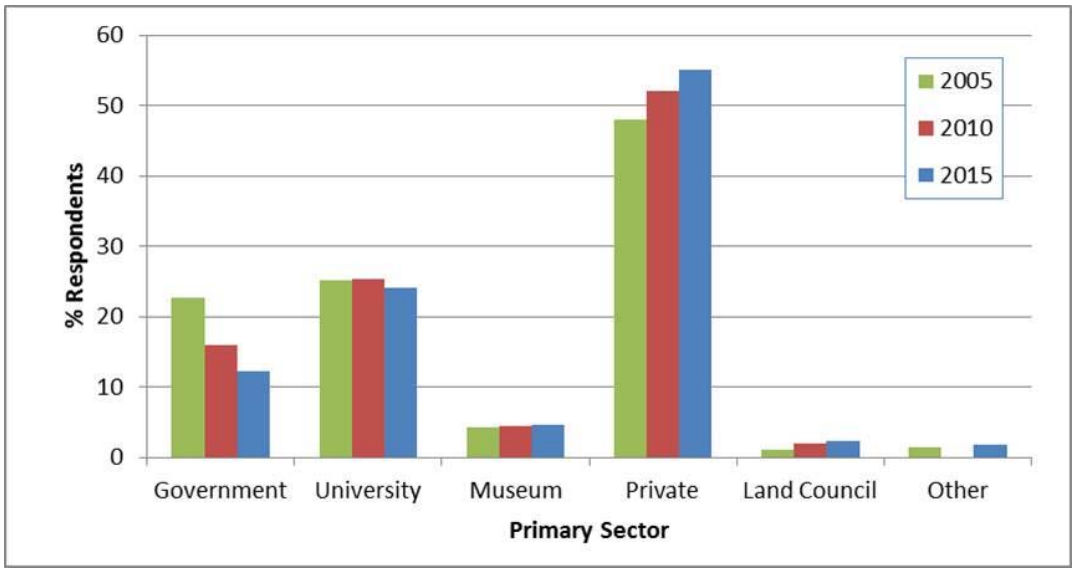

Figure 8 Employment sector trend through time.

There are still some discernible gender differences in particular employment sectors. In universities there are slightly more men (54.2%) than women (45.8%), although this is a continuation of the trend towards parity observed in 2010 (Figure 7). In the private sector there continue to be more women (52.6%) than men (47.4%), although this gap has closed slightly (54.9% women in 2010). Government employment shows gender equity.

Employment Conditions

In assessing employment conditions, analysis has included employment type – i.e. how many employed on permanent/contract/casual basis – as well as the proportion employed either part time or full-time. Analysis has also considered salary, looking at trends related to gender, subject focus, and sector of employment.

The average salary commanded in archaeology now sits at AUD$96,171, with a distribution ranging from AUD$0–$10,000 up to greater than $190,000 and a median salary range of AUD$80,000–90,000 (Figure 9). This average salary continues the upward trend previously observed (Ulm et al. 2013:37), increasing by 12% in the last 5 years (up from AUD$85,636 in 2010) but the upward trend is less pronounced than previous years when compared to the 31% increase between the 2010 and 2005 surveys (up from AUD$64,973 in 2005). The increase of 12% is also substantially below the nationally observed salary increase which has risen 21% from 2009 to 2014 (Australian Bureau of Statistics 2010, 2015). It should be noted that our archaeological average salaries are minima, as we did not collect precise income data for respondents earning above AUD$100,000 in 2005, above AUD$170,000 in 2010, and above $190,000 in 2015.

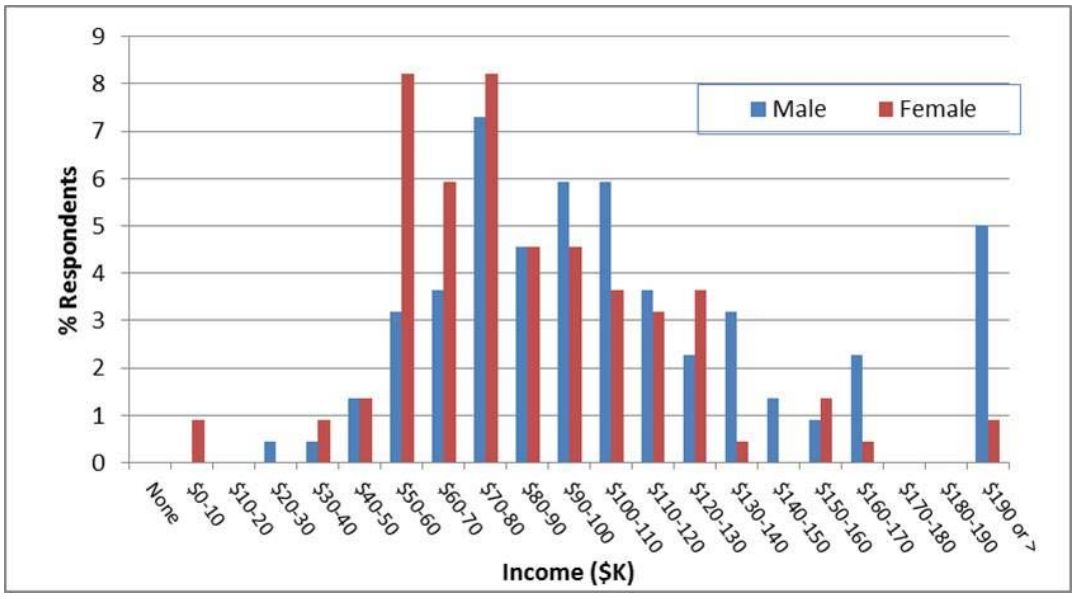

Figure 9 Full-time gross income from archaeologically-related employment during 2014 by gender (n=219). Average income AUD$96,171 (Male: AUD$105,796; Female AUD$84,906). Average income based on all income data, including those with no gender nominated. Average income based on salary mid-point; mid-point of top category taken as AUD$195,000. Salaries in bottom ranges represent part year full-time employment.

Nevertheless, in comparison to the national average salary in 2014 of AUD$80,049 (Australian Bureau of Statistics 2015), archaeologists now sit at 20% above the national average. In contrast, in 2010 archaeologists earned almost 30% (29.6%) above the national average. However, overall these data do indicate an erosion of the better working conditions experienced by Australian archaeologists over the last 10 years. When set against salaries in the discipline for other countries, archaeologists in Australia still command excellent salaries. In Britain, the average salary was £27,814 (AUD$53,584) in 2012–13 (Aitchinson and Rocks-Macqueen 2013:107), while the top end salary reached £60,000 (AUD$115,000). For Europe the highest average salary reported was €56,916 (AUD$84,706) in Denmark (Aitchson et al. 2014), still well below the average of AUD$96,171 for Australian archaeologists. While not directly comparable, a recent survey in the US examining salary data for practitioners in cultural resource management (equivalent to CHM in Australia) collated data regarding hourly rate which suggests a salary range of US$20,800 (AUD$28,400) to US$85,000 (AUD$116,000) and an average salary of approximately US$34,600 (AUD$47,250) (Rocks-Macqueen 2014).

The average salary for men in the discipline of AUD$105,796 has increased by $13,000 (14%) in the last 5 years (up from AU$92,796). In comparison, the average female salary (AUD$84,906) has risen by only 8% since 2010 (up from AUD$78,475), an increase well below the national average of 20%. This indicates a significant and growing disparity in the distribution of full-time income by gender, with women in archaeology earning an average of AUD$21,070 less than men (or put another way, men earning 25% more than women). This gap has widened since 2010 where the disparity was AUD$14,321, amounting to 18.2% difference (Ulm et al. 2013:38), while in 2005 the disparity was AUD$8,393 or 14% (women AUD$60,000 and men AUD$68,393). These observations might be partly attributable to the changes in the age profile of the discipline rather than a true weakening of income. Women dominate the younger age brackets and so the average income could be distorted by an expanding number of lower paid entry opportunities taken up by women.

Consideration of average salaries does mask the some of the detail related to the range of employment conditions. The proportion of survey respondents receiving high-end salaries has risen significantly. In 2005, approximately 9% of respondents earned over AUD$100,000, in 2010 17.5 % earned AUD$100,000 or more, and in the 2015 survey 27.9% of respondents reported a salary over AUD$100,000. This is partially due to continuing salary rises across Australia but is also influenced by a small but significant proportion (8.7%) of respondents who reported earning over AUD$160,000. Men dominate these higher salary brackets, with 16 out of 19 respondents earning above $160,000 being male (Figure 9). This is clearly partially responsible for the disparity between average male and female salaries; however men also dominate seven of the nine salary brackets above the median.

There are also differences observable in the average salary across the identified sectors of archaeological employment. Universities command the highest average salary (Table 5) followed by government employees. The figures from previous surveys indicate a trend with average salaries for those working in the private sector and museums seeing a smaller increase than average, while government has remained congruent with increases across the discipline. Land Council archaeologists report a reduction in average salary although the accuracy of this finding is impugned by the relatively small number of respondents (n=8). Universities alone showed an above average increase in salaries.

Table 5 Comparative average salary by primary employer.

Primary Employer	2015	2010	% Increase
Government	$94,189	$79,000	19.20%
University	$116,961	$85,143	37.40%
Museum	$85,000	$83,182	2.20%
Private	$89,359	$83,540	7.00%
Land Council	$79,000	$80,000	-1.30%
All	$96,171	$85,636	12.00%

Across the discipline there is a frequent narrative of increasing casualisation of workforces, both in Australia and overseas (see Schlanger and Aitchison [2010] for a range of discussions). In 2015, 69.3% of respondents were employed full-time (Figure 10). This could be regarded as a slight downward move from 71.1% in 2010 and 71.6% in 2005. These figures suggest that still less than one-third (30.7%) of respondents are employed on a part-time or casual basis (although the 2015 figures do represent a rise from 28% in 2005 and 28.9% in 2010). The major change in casualisation has been a rise in casual employment from 15.4% in 2005, to 17.8% in 2010 and up to 19.1% in 2015.

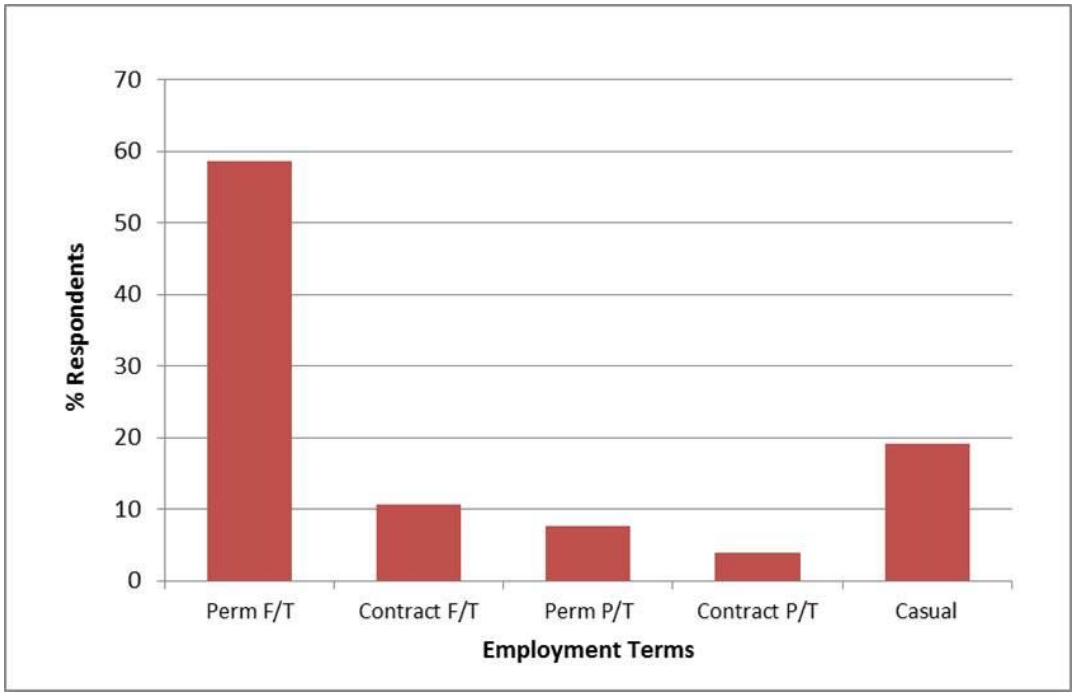

Figure 10 Employment conditions for archaeologists working in Australia in 2014 (n=329).

Interestingly, along with 19% of respondents working casually in 2015, the number of respondents working five or more days a week has fallen to 61%. This compares with 66.4% in 2010 and 65% in 2005. The increase in 2010 was seen as indicative of a trend to a more regularised workforce in larger workplaces (with 46.5% of respondents in 2010 working in workplaces with five or fewer archaeologists). Yet the falling proportion of respondents in full-time employment is accompanied by a continuing increase in the proportion of archaeologists employed in organisations of more than five archaeologists, up to 51% (cf. 47.2% in 2010 and 45.5% in 2005). This suggests a polarisation of labour with people moving from small or sole operator employment to either larger organisations or into casual work.

Qualifications and Experience

The trend towards an honours (or four year) degree as the 'minimum industry standard' for professional archaeologists in Australia (e.g. Beck 2008; Beck and Balme 2005; Colley 2004:198), is continuing, with the percentage of respondents working in archaeology with an undergraduate pass degree or less steadily falling from 15% in 2005, 12.8% in 2010 and 9.7% in 2015. The continued trend in professionalisation has also seen the percentage of respondents working in archaeology without formal university qualifications remain low with 6.2% in 2005, 2.5% in 2010 and 3.5% in 2015.

This professionalisation also continues in the comparative number of degree-qualified archaeologists. Of respondents working full-time in archaeology in Australia in 2015, 97.4% had a minimum of a degree qualification, with 93.5% of respondents holding an Honours Degree or higher, and 55% report holding postgraduate qualifications. In comparison, in the UK 94% of respondents had degree qualification or higher and 47% had postgraduate qualifications (Aitchinson and Rocks-Macqueen 2013:102), while in Europe, the *Discovering the Archaeologists of Europe 2012–14: Transnational Report* indicates overall 94% of archaeologists were degree qualified and 69% of archaeologists had postgraduate qualifications (Aitchson et al. 2014:36). [The combined data for Europe masks 10 countries that report in excess of 80% of archaeologists with post graduate qualifications and 10 countries with 99% or more of archaeologists with degree qualifications.]

Across the sector as a whole, there continues to be a marked representation of postgraduate degree qualifications (above honours level), with 55% of respondents holding postgraduate (PhD, research masters or coursework masters) degrees in 2015 (cf. 50.5% in 2005; 49.9% in 2010). However, there is some gender imbalance, with 37.7% of PhD recipients in full-time work being women and 62.3% being men (n=77). When all respondents are analysed, this is more equitable with 46.6% being women and 53.3% being men (n=103). This variance suggests a greater proportion of highly qualified women working in casual and part-time roles in comparison to men. When viewed across the qualification range (Figure 11) men dominate the research postgraduate qualifications in full-time work.

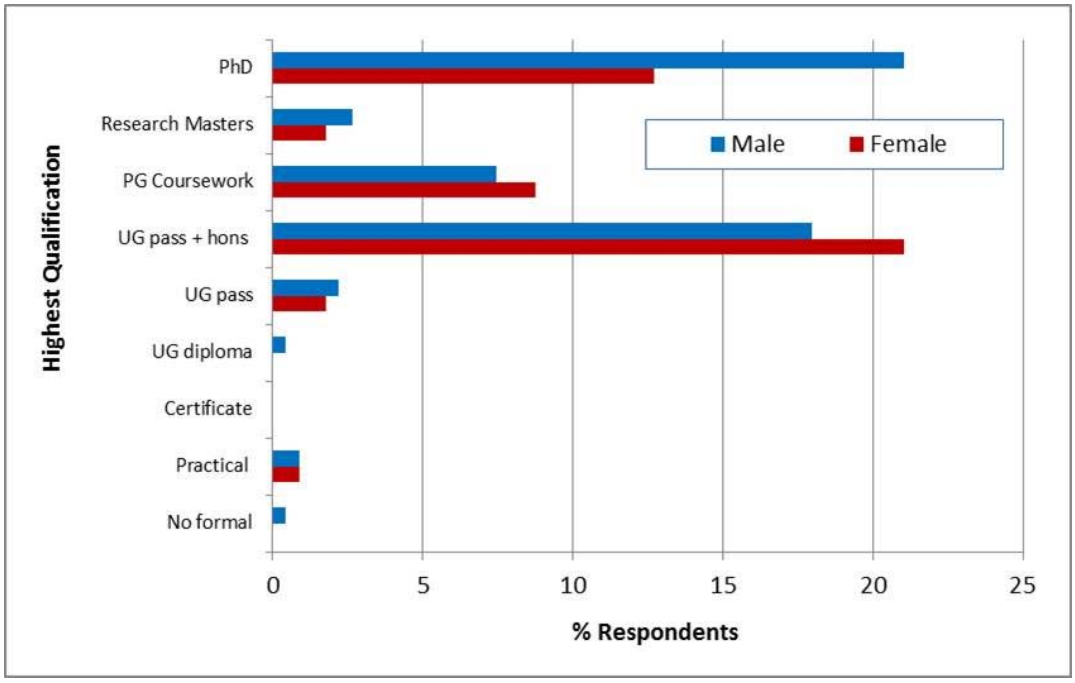

Figure 11 Highest qualification by gender, limited to those people working full-time (n=231).

The participation of overseas born and trained doctoral archaeologists is also declining with declining numbers of overseas born archaeologists. Of the 106 PhDs in Australia, 20 (19%) were received from outside Australia. A total of 40 holders of PhDs (37.7%) are from outside of Australia. This points to a continuing downward trend: in comparison, 53% of holders of PhD in 2010 were born outside Australia. Overall 21.1% of respondents had completed formal academic training in archaeology outside Australia, a minor reduction from previous surveys (23.2% in both 2010 and 2005).

As with previous surveys, primary subject focus sees some influence from university course structure. The field of maritime archaeology continued to have Masters as the most frequent qualification. In Indigenous and historical archaeology, PhD qualifications are second to Bachelor degree qualifications (including Honours) although PhD qualifications are proportionally higher in historical archaeology, possibly reflecting the smaller size of that discipline (Figure 12). PhD qualifications dominate in classical archaeology, attributable to both the seniority of those in the field and their exclusive employment through universities. Other specialised archaeology subject areas including rock art studies, archaeological science, geoarchaeology, Pacific archaeology, human evolution and pre-modern hominin archaeology, and environmental archaeology are similarly dominated by PhD qualifications.

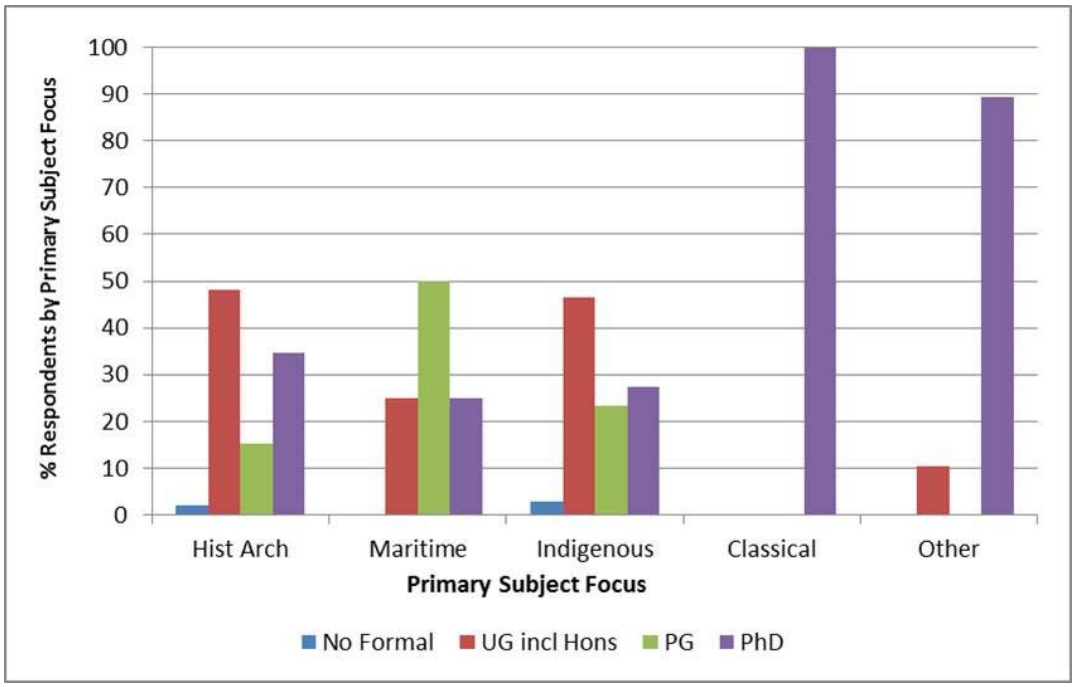

Figure 12 Highest qualification by primary subject focus, full-time only. PhD degrees are shown separately to indicate proportion of postgraduate degrees which are PhDs (n=228).

Employment sectors show differentials in qualifications of employees. PhD qualified respondents dominate for those employed in universities. Honours graduates dominate government, private and land council positions, while museums continue to show a range of qualification levels (Figure 13).

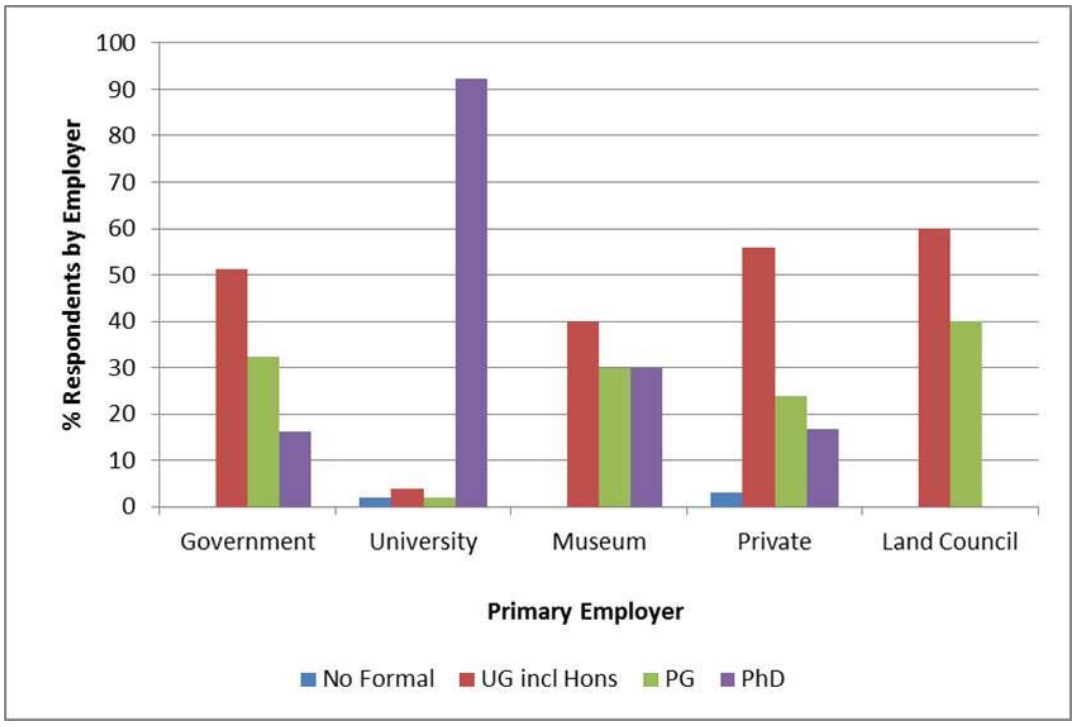

Figure 13 Highest qualification by primary employer, full-time only. PhD degrees are shown separately to indicate proportion of postgraduate degrees which are PhDs (n=229).

Qualifications continue to influence remuneration, with respondents having doctoral qualifications again dominating salary brackets of AUD$100,000 and above (Figure 14 and Table 6). Overall, PhD qualifications have equated with an above average change in salary from 2010 to 2015, while a lack of formal qualifications has resulted in an erosion of salary conditions. Those with Masters and postgraduate certificates have seen stagnation in salary. As previously observed, a significant number of Honours graduates are also represented in the highest salary brackets (AUD$160,000 and above). These data represent Director, Principal Archaeologist or other senior positons in the private sector. Unsurprisingly, given the proportion of Bachelor and Honours qualified employees, the private sector shows a lower average salary than other sectors and dominates the salary brackets below AUD$80,000–$90,000 (median) (Table 5 and Figure 15). There is also a salary disparity between disciplinary areas (Table 7).

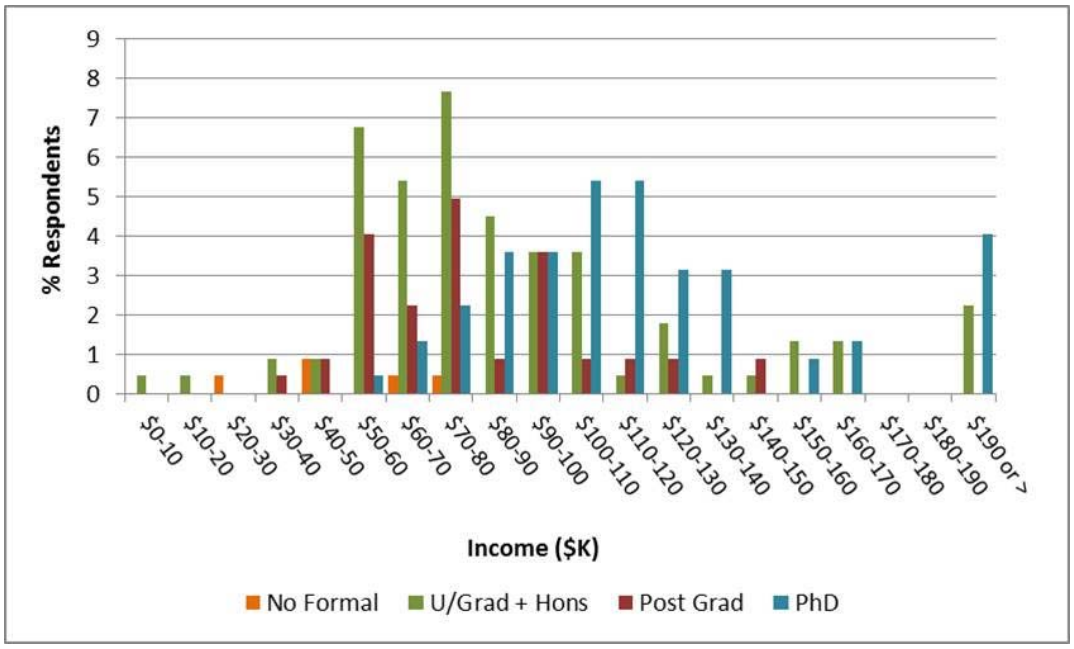

Figure 14 Relationship between highest qualification and income, full-time only. PhD degrees are shown separately to indicate proportion of postgraduate degrees which are PhDs (n=222).

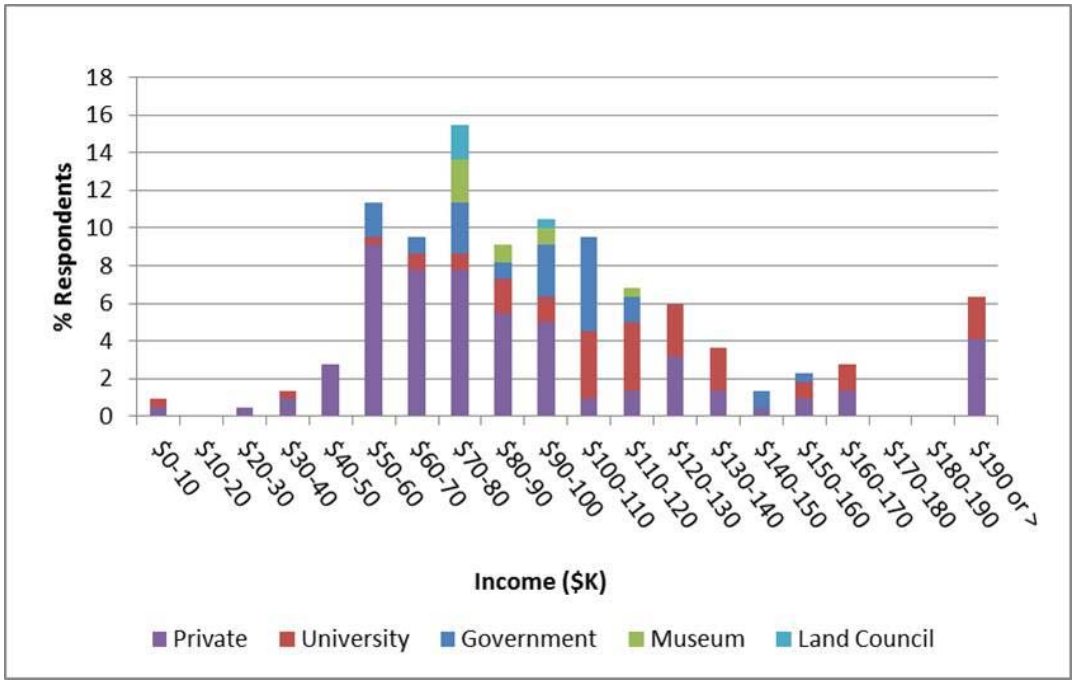

Figure 15 Relationship between primary employer and income (n=220).

Table 6 Average salary by highest qualification, full-time only.

Qualification Level	Average Salary 2015	Average Salary 2010	% Increase
No Formal	AU$51,000 (n=5)	AU$72,500 (n=10)	-29.60%
Undergraduate + Honours	AU$88,723 (n=94)	AU$80,463 (n=190)	10.30%
Postgraduate (exc. Doctorate)	AU$80,000 (n=46)	AU$81,977 (n=74)	-2.40%
PhD	AU$117,987 (n=77)	AU$94,268 (n=120)	25.20%

Table 7 Average salary by employment sector, full-time only.

Discipline	# Respondents	Salary
Historical	51	$91,863
Maritime	8	$82,500
Indigenous	145	$98,517
Classical	3	$108,333
Other	19	$114,473

Finally, volunteering continues to be an important element in qualifications and experience in archaeology in Australia (cf. Smith et al. 2015:306) and an overwhelming majority of archaeologists participate as a volunteer at some time (Figure 16). Overall, 304 respondents volunteered at some point, equating to 91.7% (n=332). Of those that volunteered, 45% volunteered for periods of 6 months or longer. This is considerably higher than previous surveys (42.8% in 2005, and 39.8% in 2010) demonstrating perhaps more restrictive employment opportunities. Volunteering covered such activities as fieldwork, laboratory work, museum work, work in libraries and administration, and outreach including talks, seminars and teaching. The majority of volunteer work (75.5%) was field-based (excavating and surveying) or in laboratories, reflecting perhaps that universities are the main providers of volunteer opportunities. The engagement of volunteers in the commercial archaeology sector is highly contested with concerns about insurance, unfair competition and ethical issues surrounding exploitation of workers (AACAI 2016).

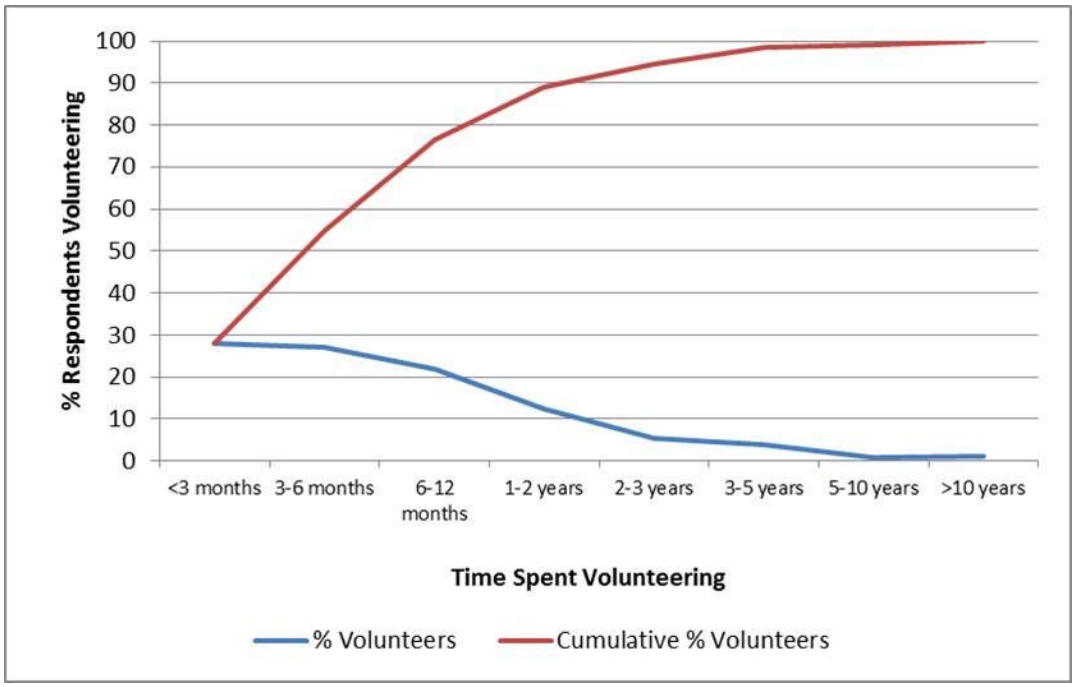

Figure 16 Time spent volunteering (n=304).

Learning and Training

Results from previous surveys have provided critical data for use in discussions regarding approaches to teaching, vocational learning, and skill levels. Overall the sector continued to support practical, vocational learning and the role of universities in providing thinking, well-qualified graduates. There is a strong support (98.7% respondents agree or strongly agree) for the need for practical *field-based* training for undergraduates. Responsibility for *undergraduate* teaching is seen to rest with universities: there is commitment by professionals to continue training *graduates* (76.4%) but not for *undergraduate* training (51.1% disagree they have a responsibility). This is matched with support for vocational experience (92.4% think a coordinated response is needed; 89.3% respondents willing to place students) and support for an increase in short-course training and professional development workshops (95%). There was also continued emphasis on the need for collaboration between universities, government and industry for teaching and learning of archaeology in Australia.

Specific skills identified in the qualitative statements of the survey were differentially rated. There was a perceived need for critical thinking skills (91.5%) but surprisingly less emphasis on Indigenous courses and teachers than on cross-institutional study. Undergraduate training is not the only area where skills are being learned at universities. Although less than previous surveys, 17.2 % of respondents undertook formal study in 2014. While this is less than for previous surveys (22.7% in 2005 survey; 22.6% in 2010 survey), of those that studied (n=60), the vast majority (82%) were undertaking postgraduate studies, and the proportion of study at doctoral level is climbing (47.1% undertaken in 2004, 48.8% undertaken in 2009 and 53.3% undertaken in 2014). However, as a number of respondents commented, university qualifications are not the only training and do not provide all the skill sets required for archaeological work. The low number of respondents undertaking formal study relative to previous surveys is at odds with anecdotal evidence of people returning to study as one response to tightening employment options.

Skill Sets and Skills Gaps

Building on analysis from the previous two surveys, an extended range of skills was surveyed again in 2015, with five additional categories included (Table 8). Skill gaps were determined by calculating an index for each respondent for each question (i.e. the gap between how valuable respondents perceived a skill to be in their workplace versus their personal level of experience).

Table 8 Skill areas used to define gaps in training. (*New for 2015 survey.)

Non-Archaeology Specific Skills	Archaeology Specific Skills
General business	Field survey techniques
Interpersonal communication	Excavation techniques
Leadership	Stone artefact identification and analysis
Human resource management	Faunal analysis
Occupational health and safety	Residue and use-wear analysis
Sales/marketing	Archaeological theory
Advocacy/public relations	Rock art recording and analysis
Report writing	Ceramic analysis
Library/archival research	Human skeletal identification and analysis
Computer literacy	Knowledge of legislation
Geographical Information Systems (GIS)	Significance assessment
Statistical analysis	Heritage management planning
Cross-cultural communication	Conservation of artefacts
Knowledge of intellectual property issues	Policy development
Photography	Understanding of research ethics
Critical thinking	Drawing/illustration
Time management	Sediment analysis
Project management	Floral analysis
Negotiation/mediation	Cataloguing of artefacts
Diving	Dating techniques *
Four-wheel driving	Remote sensing *
Teaching/training	Computer modelling and simulation *
Indigenous consultation	Ancient DNA analysis *
	Isotope analysis *

As has been observed in previous years, the most valuable skills identified are again predominantly transferable, non-archaeological skills (Table 9), field survey techniques and significance assessment the only two archaeology-specific skills in the top ten. Overall, eight of the ten skills gaps identified were archaeology specific (Table 10) and four of these skills were introduced in the 2015 survey.

Table 9 Top-10 most valuable skills (all respondents). Archaeology-specific skills shaded.

Survey #	Skill
2	Interpersonal communication
10	Computer literacy
17	Time management
8	Report writing
18	Project management
16	Critical thinking
33	Knowledge of legislation
3	Leadership
24	Field survey techniques
34	Significance assessment

Table 10 Top-10 skill gaps (all respondents). Archaeology-specific skills shaded. (*New for 2015 survey.)

Survey #	Skill
28	Residue and use-wear analysis
11	Geographical Information Systems (GIS)
27	Faunal analysis
41	Floral analysis
32	Human skeletal identification and analysis
45	Computer modelling and simulation*
44	Remote sensing*
47	Isotope analysis*
46	Ancient DNA Analysis*
12	Statistical analysis

In comparison to 2010 results, residue and use-wear, floral analysis, GIS and human skeletal analysis all remain common high priorities (top five of the skills gaps). Several of the skills identified as gaps in 2015 represent specialised skills that would not necessarily be in the toolkit of the average archaeologist. This gap may reflect a business need and an attendant opportunity for specialised skills, rather than a skills gap to be addressed by standard undergraduate training. However, given ready access to equipment and software packages it seems GIS, computer modelling and statistical analysis are areas where wider training might be advantageous.

When these results are further analysed with respect to sector and subject focus there is marked commonality in skills gaps across subject focus (Table 11) and primary employer (Table 12). In particular GIS, faunal analysis, floral analysis, residue and use-wear analysis and human skeletal identification and analysis recur in a number of sectors.

Table 11 Top-10 skill gaps by primary subject focus. Shaded cells indicate skill gaps common across all primary subject focus areas.

Indigenous	Historical	Maritime	Classical	Other
Human skeletal identification and analysis	Residue and use-wear analysis	Isotope analysis	Indigenous consultation	Ancient DNA analysis
Residue and use-wear analysis	Geographical Information Systems (GIS)	Ceramic analysis	Floral analysis	Residue and use-wear analysis
Floral analysis	Faunal analysis	Faunal analysis	Isotope analysis	Computer modelling and simulation
Geographical Information Systems (GIS)	Rock art recording and analysis	Sediment analysis	Ancient DNA analysis	Geographical Information Systems (GIS)
Faunal analysis	Dating techniques	Computer literacy	Significance assessment	Remote sensing
Computer modelling and simulation	Stone artefact identification and analysis	Stone artefact identification and analysis	Residue and use-wear analysis	Faunal analysis
Remote sensing	Remote sensing	Remote sensing	Geographical Information Systems (GIS)	Isotope analysis
Ceramic analysis	Floral analysis	Dating Techniques	Statistical analysis	Indigenous consultation
Isotope analysis	Sediment analysis	Rock art recording and analysis	Faunal analysis	Statistical analysis
Ancient DNA Analysis	Human skeletal identification and analysis	Ancient DNA analysis	Sediment analysis	Floral analysis

Table 12 Top-10 skill gaps by primary employer/sector. Shaded cells indicate skill gaps common across all sectors.

Government	University	Museum	Private	Other
Geographical Information Systems (GIS)	Residue and use-wear analysis	Leadership	Residue and use-wear analysis	Policy development
Computer modelling and simulation	Floral analysis	Indigenous consultation	Human skeletal identification and analysis	Geographical Information Systems (GIS)
Leadership	Ancient DNA analysis	Geographical Information Systems (GIS)	Faunal analysis	Leadership
Faunal analysis	Geographical Information Systems (GIS)	Computer modelling and simulation	Floral analysis	Ancient DNA analysis
Remote sensing	Isotope analysis	Advocacy/public relations	Geographical Information Systems (GIS)	Computer modelling and simulation
Advocacy/ public relations	Computer modelling and simulation	Human skeletal identification and analysis	Remote sensing	Ceramic analysis
Residue and use-wear analysis	Faunal analysis	Cross-cultural communication	Advocacy /public relations	Human skeletal identification and analysis
Dating techniques	Statistical analysis	Heritage management planning	Rock art recording and analysis	Negotiation/mediation
Conservation of artefacts	Human skeletal identification and analysis	Human resource management	Statistical analysis	Four-wheel driving
Floral analysis	Remote sensing	Residue and use-wear analysis	Isotope analysis	Stone artefact identification and analysis

Conclusion

The 2015 Australian Archaeology in Profile survey show the shifting profile of the profession over the last 10 years and changing employment conditions. Indigenous archaeology remains the largest subject focus, although there is some movement towards historical archaeology. However, the continued low participation rates of professionally qualified Indigenous archaeologists remains a challenge for the discipline. There is a continued strong participation of women, matched to an increasingly young age profile with women continuing to dominate younger age brackets.

The Australian archaeological workforce is highly qualified, with increasing numbers of professionals holding a minimum of an honours degree and fewer practitioners holding only an undergraduate pass degree or no formal university qualifications. There is continuing expansion in the numbers of professionals holding postgraduate qualifications. Skill gap analysis continues to show that non-archaeological skills are highly valued, however common skill gaps were identified across subject areas which are a prime target for professional development opportunities (Geographical Information Systems and Faunal analysis). Specialised niche archaeological skills are also in demand including (e.g. Residue and use-wear analysis, Human skeletal identification and analysis, Isotope analysis and Ancient DNA analysis).

Results show continued growth in the profession as a whole and the private sector in particular, a result at odds with a perceived reduction in employment opportunities anecdotally attributed to the global financial crisis and its aftermath. However, income growth is weak and there is a notable trend towards a more casualised workforce. Most problematic is the widening disparity in employment conditions between men and women, with women experiencing lower salaries and greater proportions of casual, part-time and contract employment.

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