NAWS at 30: Farmworker Employment and Earnings

(Preliminary Conference Draft)

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Abstract:
Drawing from experience with both the confidential and public use forms of these data, I provide recommendations concerning current and future challenges to understanding what's important about the U.S. agricultural workforce. I suggest specific changes (some of these aspirational) to the survey design and questionnaire of the National Agricultural Workers Survey (NAWS) to better meet informational needs associated with the U.S. farmwork population and its characteristics which have evolved over time. I bring the perspective of a researcher from Colorado, a state which is embedded (buried) within the sampling regions as they currently stand. I thus focus on employment and earnings, the topic of this panel, through intersections with geography. I conclude with miscellaneous comments pertaining to emerging issues in agricultural work associated with safe and healthy work.

Introduction

My love affair with the National Agricultural Workers Survey (NAWS) from the U.S. Department of Labor started around 2004 when I stumbled across these data as a possible source of information on undocumented workers in America for my dissertation in Economics at Stanford University. I was interested in undocumented status broadly, and these data offered some of the only microeconomic data around with self-reported (and detailed) information on legal status. Agriculture's labor sector became a research passion over time, continuing when I moved to a land-grant institution to start my professional career. While my dissertation used the confidential version of NAWS (via agreement with the Department of Labor and its then contractor Aguirre International (now JBS Aguirre Division)), my work using NAWS since that point has primarily utilized the public use version. As the public use realm is that in which many academic economists using these data are currently operating, I bring the public use perspective to these comments by providing comparisons across geographic identifiers across the two versions of data. In this paper therefore, I summarize (some of) what "we" have learned in the 30 years of NAWS, drawing most specifically from what I have learned in my 15 years of loving (and sometimes hating) these data. I hope that my comments in conjunction with those from colleagues at this conference support both the continuation of the survey into the years ahead and modifications of NAWS to better elicit information about what's important to modern agricultural work and our understanding of it.

This paper proceeds as follows. I start my summarizing my past work with NAWS which illustrates how these data can be used to answer farm labor questions (many of which are questions relating to employment and earnings). I then detail features of the employment and earnings data and of geography using the confidential version of the dataset provided for this conference. I make suggestions based on interests of myself and others in modeling the effects of the various types of public policies that applied microeconomists often study using developments in quasi-experimental methodologies in econometrics over time. I then discuss other emerging issues pertaining to farm labor which are inspired by discussions with researchers, growers, and other stakeholders in my home region.

Summary of my Research on Agricultural Labor Markets and Economic Policy with NAWS

Much of my research has examined economic issues surrounding the special population of farmworkers in the U.S. My most recent work using these data has examined public health considerations, aspects of labor supply and relevance to labor law, and participation in public programs and services. At the intersection of economics and public health, I recently examined demographic and work-related characteristics and worker exposures to health-related risk associated with poor field sanitation (Pena and Teather-Posadas, 2018). Despite a relatively low risk on average nationally, our research documents substantial regional variation through the current period and how socioeconomic characteristics related to disadvantage (e.g., low education, limited English language background, and being an immigrant worker from Mexico (documented and otherwise)) are predictive of remaining gaps in access to basic sanitation which correlates with food safety that affects consumers broadly. As such, this research was featured this fall on NPR (showing the usefulness of NAWS toward informing discussions of public interest). My continuing work in the area of farmworker health examines correlates of disease and injury (Pena, 2019), and compensating wage differentials associated with pesticide application (Pena and Dixon, 2019).

Two other recent papers with co-authors have examined trends in agricultural labor employment aspects and relevance to understanding dynamics of labor supply as relevant to the food economy. Our work has examined how follow-the-crop migration has decreased substantially over time since the late 1990s and early 2000s and how these patterns relate to structural change in the agricultural sector (Fan, Gabbard, Pena, and Perloff, 2015), and how the Great Recession affected agriculture and impacted agricultural workers differently from what was the experience in other sectors (a pattern interrelated with relatively inelastic demand for food items) (Fan, Pena, and Perloff, 2016). In addition, we show that the recession had a distributional effect of increasing the wage gap associated with legal status. Since these papers indicate significant temporal change in worker characteristics and their experiences (labor supply composition) and labor market returns (structural change), they are suggestive that the 1989 original survey design and questionnaire may become increasingly dated as trends continue.

Other previous work in the area of agricultural employment and earnings examined business practice such as farm labor contracting (Pena, 2012), compensation practice such as piecerate pay schemes in comparison to hourly rates (Pena, 2010a), anticipated impacts of legalization and work authorization proposals (Pena, 2010b), and geographic sorting (Pena, 2009). Finally, I have used NAWS to examine the effects of public policies and services available and utilized by farmworkers ranging from continuing education (Pena, 2015) to welfare programs more generally (Pena, 2014), and of labor law pertaining to child labor (Fan, Houston, and Pena, 2014). These papers are relevant for understanding how public policy impacts farmworker populations and for dispelling myths about response dynamics (e.g., showing how workers who participate in job training programs see higher wages and hours worked (and decreased incidence of poverty) and have higher attachment to the U.S. workforce; documenting the absence of welfare migration in undocumented worker populations; and documenting the extent of non-compliance with current child labor regulation, thus providing support for labor law amendments to protect vulnerable children). Continuing work at the intersection of public policy and farm labor examines covered and uncovered workers and minimum wage legislation (Fan and Pena, 2019).

While this agenda research has been successful and engaging for me, substantially changing supply side dynamics suggest limitations to the extent to which these data can be used to further build understanding of the evolution of the farmwork population and for the purpose of future forecasts and policy analysis. In other words, the extent to which we are achieving the original primary purpose of the survey ("to monitor the terms and conditions of agricultural employment and describe the demographic characteristics of hired crop workers" (https://www.doleta.gov/naws/pages/overview/primary-purpose-and-uniqueness-of-the-survey.cfm)) may be inconstant. I therefore welcome the opportunity to contribute to this important discussion.

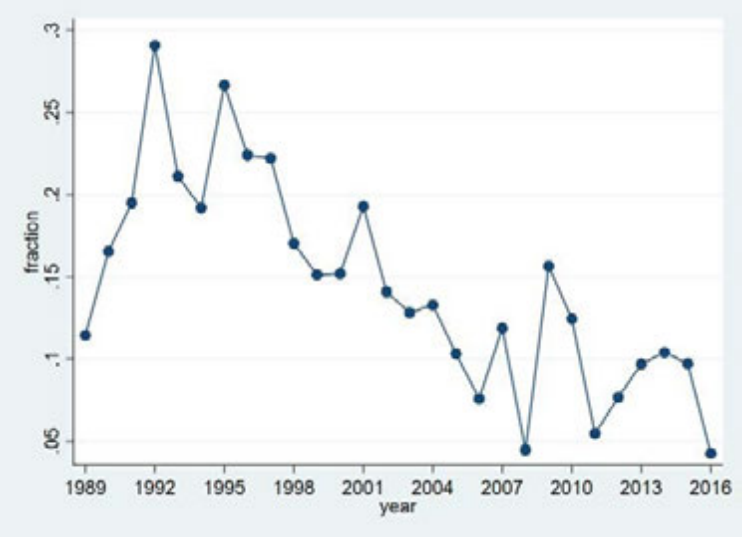
NAWS Going Forward: Employment and Earnings

Using the full confidential NAWS data including the household, work-grid, and health files, I study current limitations to our abilities to use the survey for the purposes of understanding farm worker employment, earnings, and other outcomes (e.g., health). In what follows, I pay attention to questionnaire and survey design/representativeness in recent periods in comparison to the past and across geographies and with respect to variation in firm (farm) characteristics.

Employment
All NAWS workers are employed which makes questions of the act of employment itself less interesting in these data. The sample is by definition "selected" on work status since the design is based on sampling from work sites. Researchers therefore need to remain cognizant of this feature of these data and the limitations implied. Still, we may use these data to ask and answer questions as to where people are employed and what is the focus of their work. The confidential data, for example, allow for the ability to examine crop and task allocations at a more detailed level than what has been available in public use data.

Earnings
Earnings, on the other hand, are more complex and are arguably more interesting in these data than elsewhere. Researchers using the public use dataset are most likely to focus on "waget1," a constructed variable based on wages in the primary task at the time of the interview. For timerate workers, this is effectively the hourly wage rate. For piecerate workers, there is a detailed construction behind the scenes (constructed variable provided by DOL with the public use data). Because a large fraction of agricultural workers are paid piece rates (i.e. wages based on output) instead of time rates (i.e. wages based on time input), hourly-equivalent wages are constructed for piecerate workers based on survey questions indicating how much a worker (and his or her crew if applicable) was paid on average for each unit of output (e.g., box, bin, etc.) and how many units were produced in an average day, along with crew size information. These hourly-equivalent piecerate wages are then (arguably) comparable with hourly rates reported by other workers. The construction, however, means that this variable is measured with a different type of error than for the former group. However, the (weighted) fraction of workers paid piecerate (though variable by year) has decreased over time (Figure 1), thus minimizing this concern.

Figure 1: Fraction of workers paid piecerate over time



Source: NAWS and author's calculations.

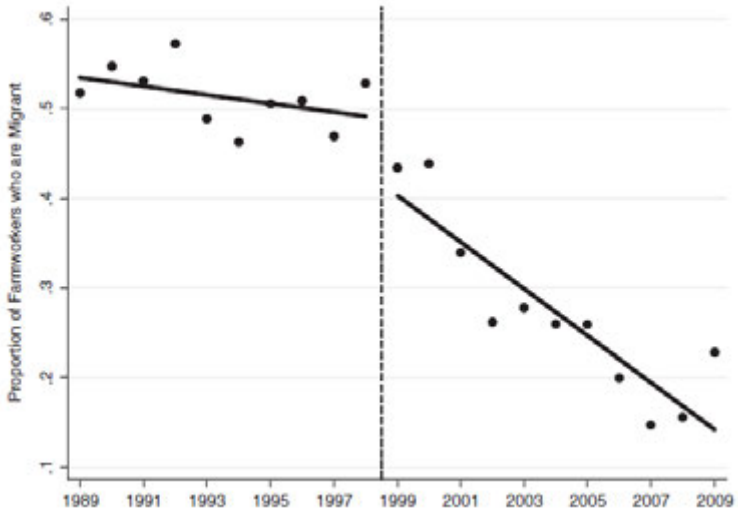
The Changing Geography of NAWS and Relationships to Employment and Earnings

One of the key advantages (in my opinion) of being able to look at the confidential data relative to the public use is the ability to look at a more nuanced take of geography. As we know, the sampling is representative nationally and for "regions" as opposed to for states. Still, I do examine state representation for some points here to highlight considerations for the next wave of NAWS.

Throughout the analysis, I use "cluster" which represents the farm labor areas as the primary sampling unit variable. I use "pwtycrd" as the probability weight as my purpose here is to examine several years concurrently. I define a strata variable based on "season" and "REGION12." Strata then is set at 36 season-region combinations.

I examine three sets of years in most of what follows. Particularly, I examine the time periods of 1989-1998, 1999-2008, and 2009-2016. These divisions have several reasonings behind them. First, the NAWS is at its 30-year mark as is the occasion of this conference. It therefore seems straightforward to examine changes over these three decades by dividing into 10-year bands. The final band is shorter by this method due to the availability of the data that were provided for this exercise (which only go through 2016). However, there are other reasons which support these breakpoints aside from the title of the conference. The year 1999, for example, is a break point for which co-authors and I identify as being specifically important in terms of internal (e.g., follow-the-crop) migration patterns (Fan, Gabbard, Pena, and Perloff, 2015). We find this trend to be robust to legal status, migrant stream, and age group subsamples. In that paper, we examine data through 2009 as that was the available end-point in the public use data at the time of that writing. The 2009 year therefore serves as another interesting break-point moving forward as it corresponds to the end of some of our other analyses (and that of other authors since one of the recent public use releases was through this end year).

Figure 2: Migration rate over time



Source: Fan, Gabbard, Pena, and Perloff (2015), reproduction of Figure 1 in that publication.

Finally, it should be noted that 1999 serves as a break point for another reason as this is the point in which the sample surveying methodology of NAWS was changed from being based on Crop Reporting Districts to being based on Farm Labor Areas. This unit was determined to be more robust in terms of reducing heterogeneity within the cluster unit ("Statistical Methods of the National Agricultural Workers Survey").

In Tables 1 and 2 (at end of document), I provide first a matrix summarizing and comparing NAWS' regional definitions within the U.S. and then examining NAWS' regional sampling over time numerically in terms of the proportions of the final sample. I look at the three decades of the survey as noted (in columns (2) through (4)) in addition to an aggregation across all years (column (1)). I tabulate regional fractions of the total sample (or total subsample) using NAWS weights and accounting for the primary sampling units and 36 season-region strata within year. The six panels of the table correspond to the six regional classifications available in the public use data ("REGION6") whereas the regional classifications under these six labels correspond to the 12 regional classifications in the confidential data. Of note, I am unable to calculate a reliable standard error for the first decade (1989-1998) alone using this method. This is due to limited county variability within strata and corresponds to the timeframe of the survey under which crop reporting districts instead of farm labor areas were used for the sampling.

The overall patterns revealed in the table are indicative of regional differences over time in terms of concentrations of survey locations. The California and northwest samples as a proportion of the whole have increased over time and representation of the east and southeast regions has decreased. This is further examined in Figures 3 through 6 which show details of the state-to-state sampling over time. These figures, however, should be taken with a grain of salt since the sampling is not designed to be representative of farm laborers at the state level. Still, it is useful for researchers, including this audience, to better understand the underlying patterns of data collection over geography to better understand what NAWS currently is and isn't.

Changes in the Sampling States and Implications

NAWS is choosing workers from more states over time, and this is promising. Figure 3 illustrates the state sampling distribution over all years of the NAWS. Figures 4, 5, and 6 illustrate the state sampling for the first 10 years, the second 10 years, and years since. The proportions of workers actually surveyed in each state are indicated by the shading. Darker shades correspond to states in which many workers were sampled and lighter shades correspond to areas with lesser coverage in terms interview locations. Pure white corresponds to no workers at all. Comparing Figures 4, 5, and 6, we note that the geographic scope of NAWS has increased substantially over time with interviews now occurring in most states (Figure 6) as opposed to in just a handful of states (Figure 3). I bring this distribution up as an illustration of what has been meant by "regionally representative" in terms of the underlying workings of the survey. This leads to a bigger point and a first recommendation.

Recommendation: Expand the survey to be representative at the state level (even if this could only be available in the confidential version). From examination of the figures, we see that the survey has been moving in this direction over time with workers today being sampled in more diverse locations than in the early years. Since expanding NAWS to the state level would be clearly costly, why should we consider this seriously? I argue that accurate state sampling would allow researchers to match workers to a variety of state-level features and public policies. This would allow researchers (academically and in the public sector alike) to exploit developments in econometric methods pertaining to quasi-experiments ("natural" experiments) by allowing analysis of state-level policies (e.g., labor laws, minimum wages, state-level investments in agriculture and/or agricultural workers, future cases of legislation like Arizona's LAWA, etc.). These types of analysis, although important, have been largely skipped given NAWS' geography.

If we look at my home region of Mountain 1 2, this is comprised (in the confidential data) of Idaho, Montana, Wyoming (USDA's Mountain 1) and Colorado, Nevada, and Utah (Mountain 2). However, Idaho tells me little about my home state of Colorado (and for the most part neither does Nevada). In the public use set, these states are further consolidated with Washington and Oregon (note that Washington arguably tells me even less about Colorado). At very least, moving the sampling region up to USDA region (i.e. from the current 12 regions to 17) would be an improvement for understanding regional activity. Moving to the state level, however, would be ideal.

Figure 3: Proportions of workers by state, all years

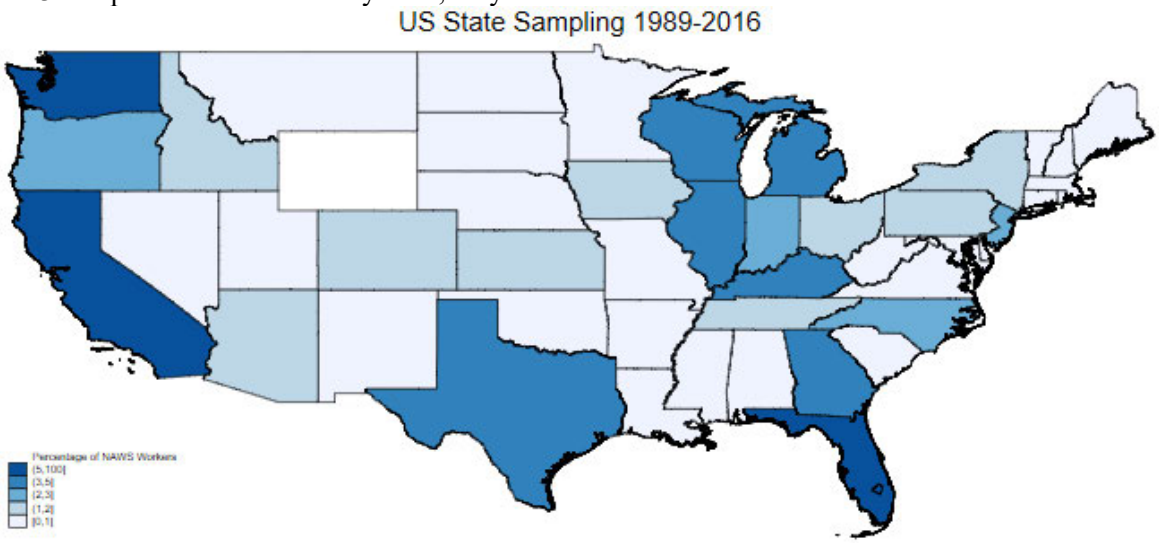


Figure 4: Proportion of workers by state, first 10 years

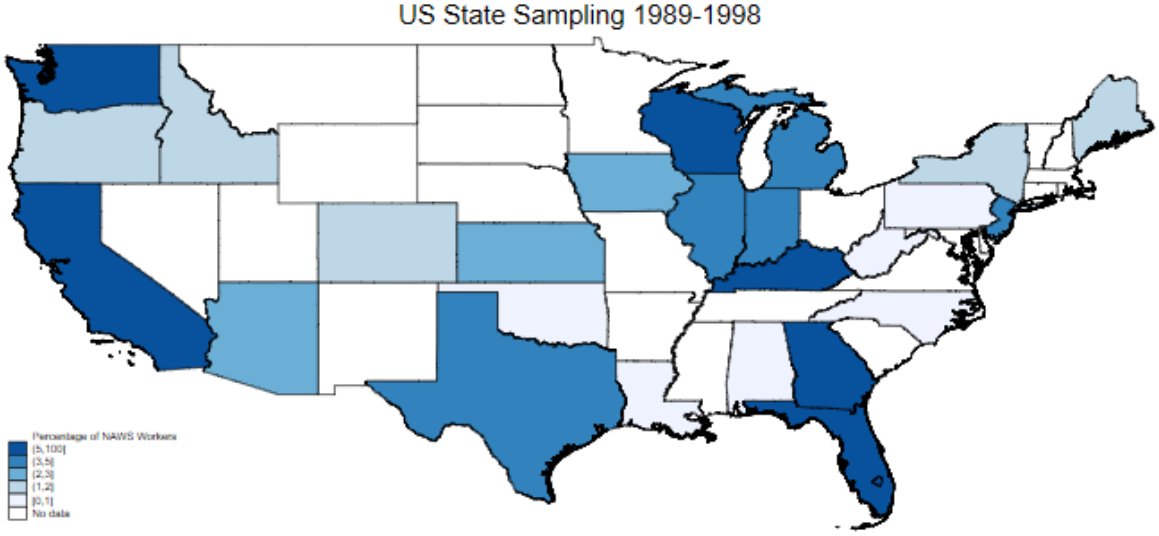


Figure 5: Proportion of workers by state, second 10 years

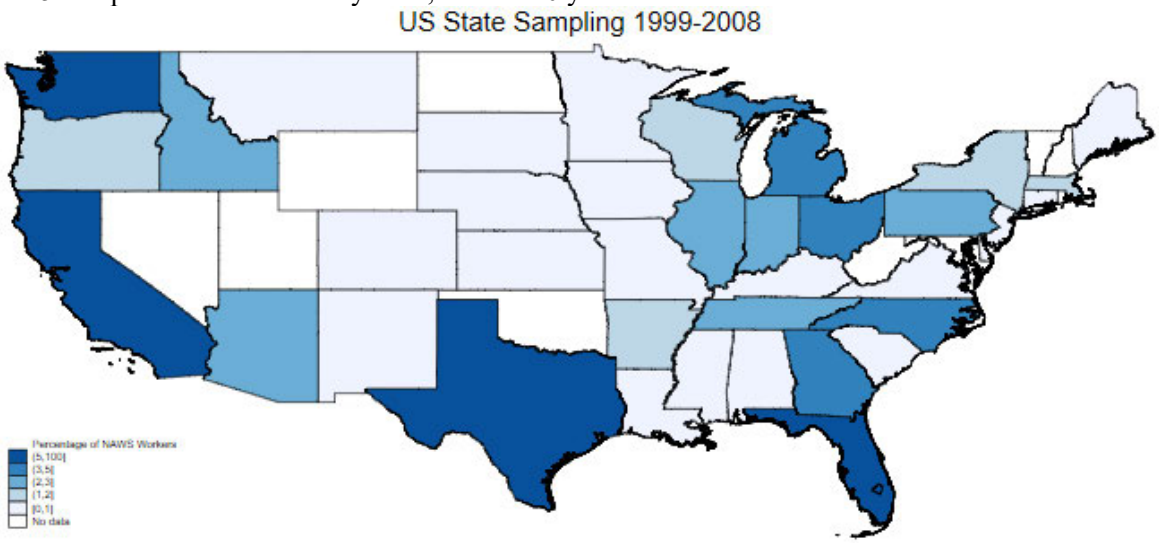
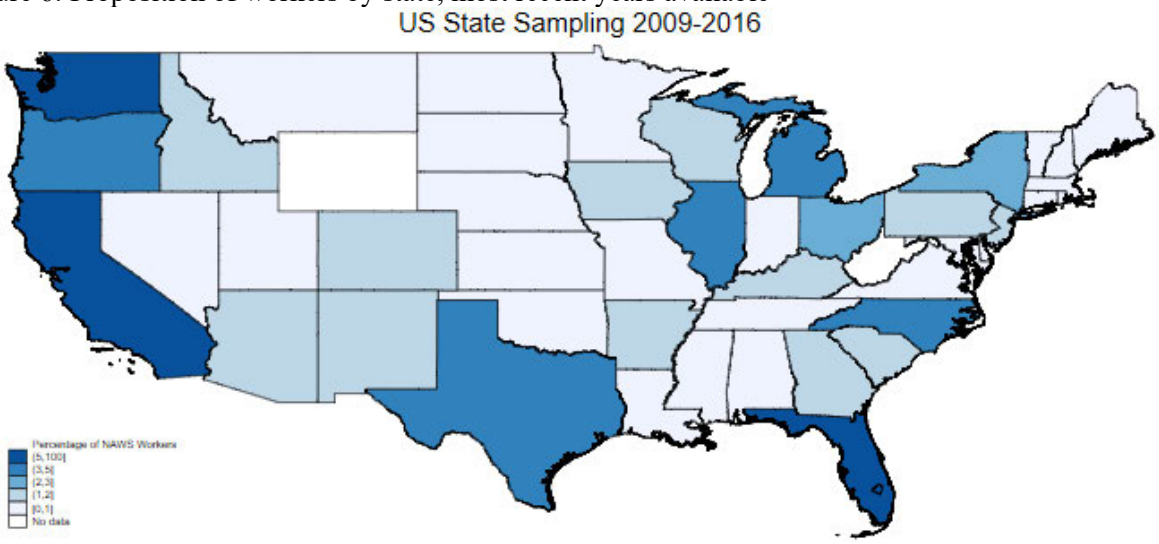


Figure 6: Proposition of workers by state, most recent years available



Demographics of NAWS and Relationships to Employment and Earnings

I tabulate select worker characteristics by geography in Table 3. Although this could be extended to examine patterns across many other variables, in the interest of time and space for this paper I focus on just a few key variables. I compare the 12 region code to the six region code to further illustrate limitations of the public use data for understanding labor activity in some areas. In the case of my home region ("northwest" in REGION6 and "MN12 in REGION12"), I also add the case of Colorado as an illustrative example (despite being well-aware that these data are not representative at this level). I do this as a rough illustration of the sensitivity of the regional definition (first between the six region code and the 12, and then to the state-level in a non-California, non-Florida case). This shows how researchers are limited in their ability to use the NAWS given its regional as opposed to state-level scope.

The table shows that worker outcomes associated with employment (i.e. wages and hours) are quite variable across region codes. Some demographic variables (I restrict to gender, age, education and farm experience) are also notably variable within and across regions. For example, average education in years is 7 in the Pacific Coast and 9 in Mountain 1 2. These regions are aggregated in the public use data, thus hiding this complexity. There are similar differences in this variable in the Southeast across the sub-regions represented there. Average education is 6 years in one area and 8 in the other. Large differences on average in worker age and gender compositions are also evident. I would argue that the aggregation of areas so different is a difficult feature of NAWS for researchers to overcome especially given how many agricultural labor questions (especially those most relevant on the ground level) are regional. I argue that this further supports more refined geographic sampling.

A (Basic) Regional Analysis of the Determination of Earnings

As a final illustrative example on this topic, I present a series of (very basic) Mincer regressions in Table 4. Mincer regressions in traditional labor economics model schooling, experience, and experience squared as determinants of labor earnings. Although this methodology is not perfect (documented elsewhere), I examine some of these simple regressions for wages while controlling for year dummies and stratifying by regions in a way similar to the previous exercises presented in this paper. These regressions should be interpreted as being for the purpose of illustrating differences across regions generally as opposed to for the identification of causal effects.

If we are willing to consider these as being reasonably specified as an approximation, then I pose the following thought experiment. If we look at the coefficients on education (for example) across the several columns corresponding to the six and 12 regions respectively, we will notice that there is substantial variation across the regions in the 12 that have been collapsed into the six. For example, the "effect" of education on earnings in the Mountain 1 2 region is on the order of 6 percent whereas it is on the order of 12 percent in the Pacific Coast region. Again, this illustrates the limitations that researchers face with the public use data in terms of determining actual earnings relationships in these data and also illustrates particular sensitivity associated with the "Northwest" region in NAWS. If as practitioners we are interested in regional differences in employment and earnings, then the NAWS is not necessarily the "best" sample and we are left with the task of creating primary data independently to ask and answer many of the types of questions that are coming up for various locations in the U.S.

Additional Recommendations

In the remaining space, I respond directly to some specific questions as posed for this conference:

(1) *whether the NAWS methodology of multi-stage sampling to account for seasonal and regional fluctuations in farm employment or other aspects of the survey's design need to be modified*

(2) whether the NAWS questionnaire should be modified to collect better or additional data

I relate my answers to a continued discussion of the survey's strengths and weaknesses drawing from my past experience with NAWS, while noting particular changes in the survey design and questions that could help better meet farm labor information needs in the context of emerging programs and policy issues. I frame my answers in terms of citing some emerging issues from my perspective and the my particular recommendations relating to each.

Emerging Issue: Changes in Origins and Implications
Following my earlier focus on geography, I also consider changing patterns and geographic representation in terms of worker origins. I restrict to workers who report being foreign-born and responding to the question" B18 [IF FOREIGN BORN] Before coming to the United States, in what state/department /province did you live?" with a response corresponding to a state in Mexico. (I take this to be a reasonable exercise to examine given that almost 70 percent of the total (weighted) NAWS sample reports being from Mexico.)

Figure 7 shows a summary across the available NAWS timeframe as to where workers coming from Mexico report that they are coming from. Figures 8, 9, and 10 compare the early, middle, and recent decades of NAWS to show how these patterns are changing. This is suggestive of who the workers are in terms of backgrounds and life experiences changing over time, with higher concentrations coming from the south of Mexico over time.

Related to this observation is the feature that the fraction reporting having worked previously in agriculture is falling. I provide a tabulation of question "B16 [IF FOREIGN BORN:] When you lived in your country (outside the U.S.A.), did you work in..?)" to illustrate:

VARIABLES	(1) All Years	(2) 1989-1998	(3) 1999-2008	(4) 2009-2016
Agriculture	0.579	0.595	0.614	0.514
	(0.00801)	(0)	(0)	(0.0158)
Observations	50,704	15,696	22,179	12,829

Standard errors in parentheses
Source: NAWS and author calculations.

This is an important consideration for things like worker safety and training programs as workers are seen to be coming with less agricultural experience than in past decades. Furthermore, the higher concentrations of workers coming from farther distances, coupled with current public policy attention to "border security" suggests that we might be interested in features of the trek and border crossing themselves.

Recommendation: Add a question on rural versus urban origin. The information on past agricultural employment (B16) partially gets at this, though general rural/urban experience in life could also be relevant for safety training considerations and for assessing demand for other public services in agricultural migrant communities. The home country state of origin variable is too broad to cleanly capture rural/urban experience.

Figure 7: Proposition of workers by state of origin, all years

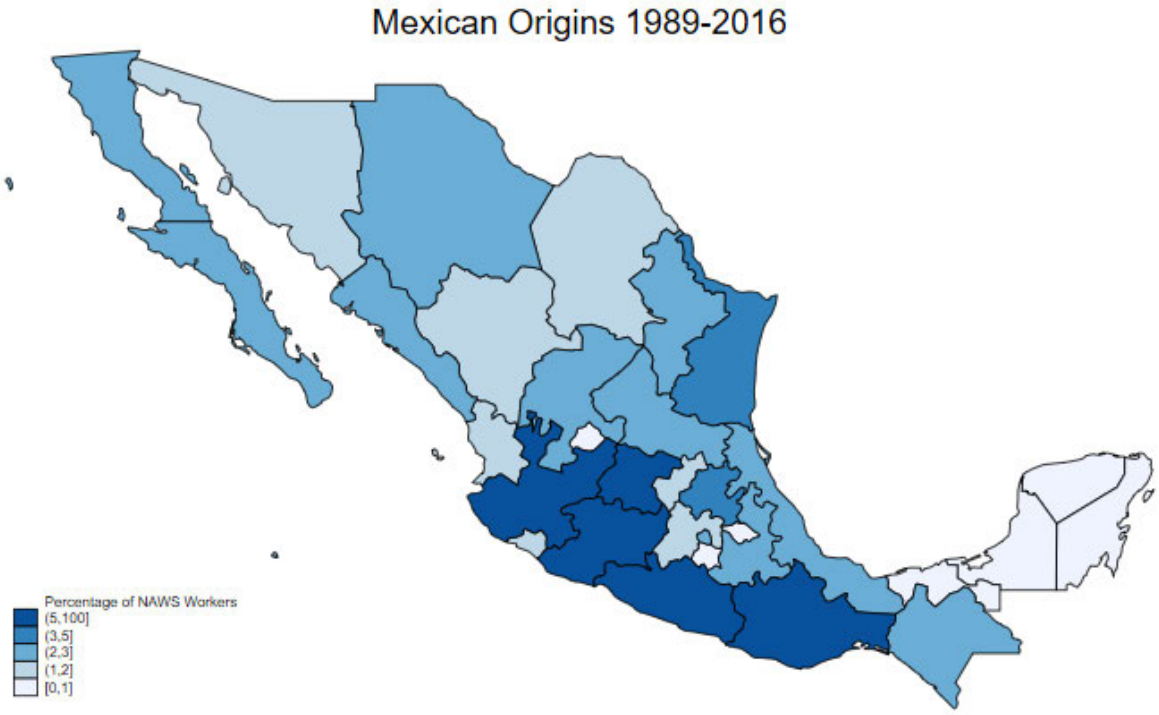


Figure 8: Proposition of workers by state of origin, first 10 years

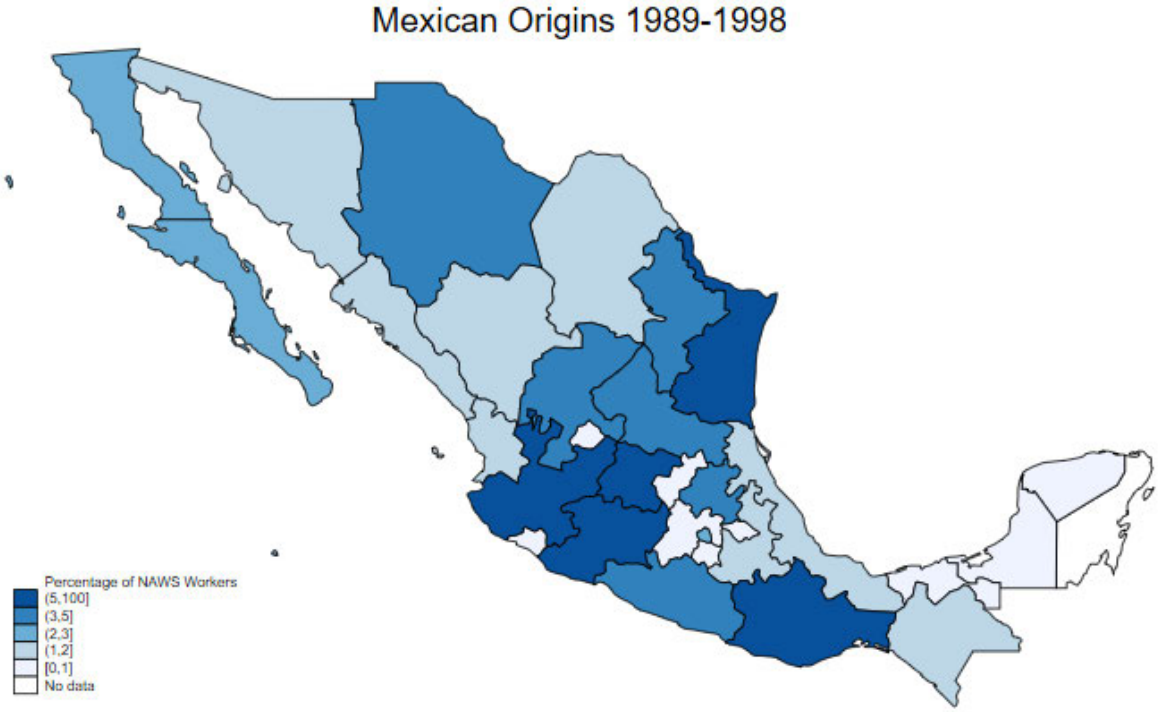


Figure 9: Proposition of workers by state of origin, second 10 years

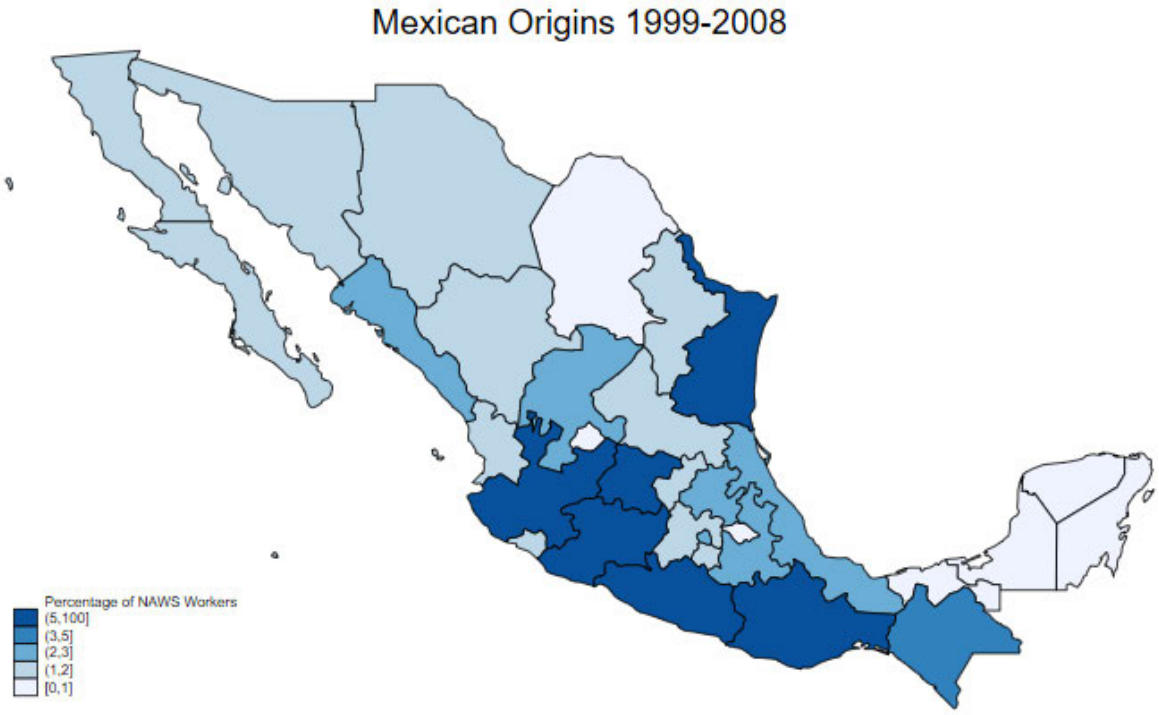
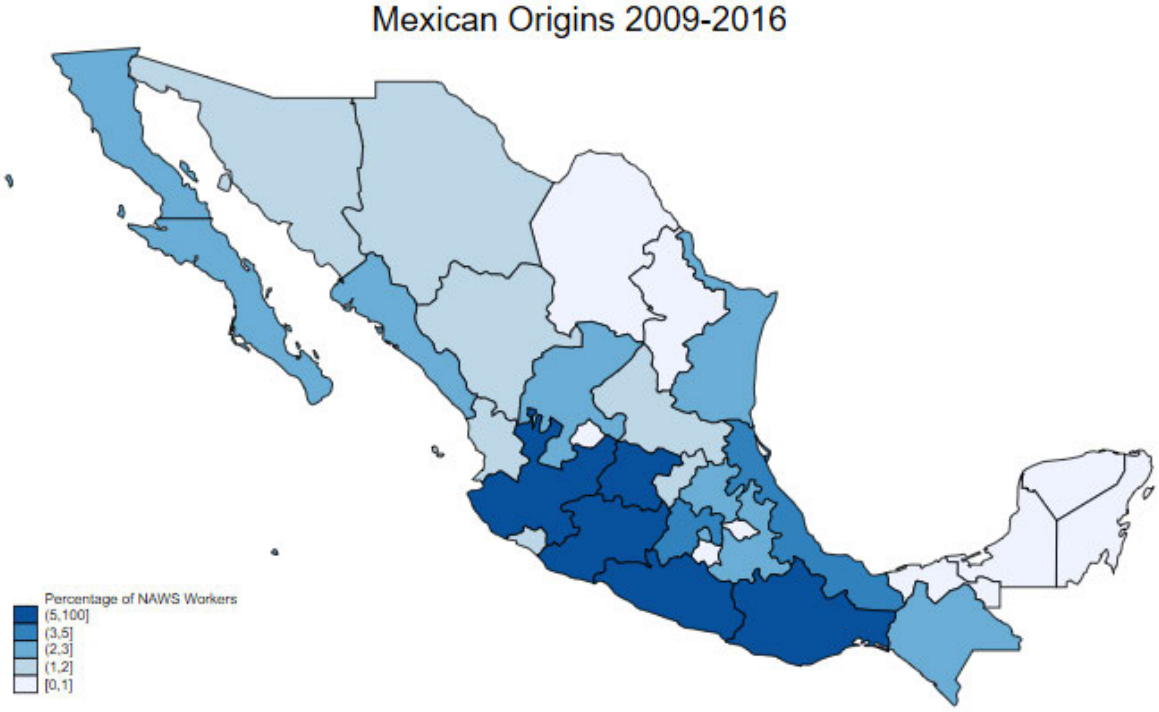


Figure 10: Proposition of workers by state of origin, most recent years available



Recommendation: Add a module on border crossing experience. The Mexican Migration Project (MMP) database has traditionally asked questions about how people arrive (e.g., Using coyotes? Entering where? And with whom? And at what cost? Etc.). The questionnaire associated with this alternate dataset (although it's a sociological and ethnographic design and not representative statistically in the same way as NAWS) could serve as a reference for this module. Furthermore, the MMP has been good about documenting features of cultural significance (e.g., Border crossings annually for religious holidays? Other revolving door-type intents?), and this could also be used as a model for extended NAWS questions in this area. A simple added question on religion could by itself be interesting in terms of eliciting information about who the international migrants in farmwork are (and likewise for non-immigrant workers) and what are their motivations.

Emerging Issue: H-2A Workers

The NAWS survey has traditionally excluded H-2A workers by design. A tabulation of the constructed "newcomer" variable shows that the fraction of newcomers to the U.S. agricultural workforce has decreased substantially in the last cycles of the survey. This indicates that growers may face increasing demands for workers from other sources such as the H-2A program (especially if there is movement in terms of revising this program at the national level to make it more accessible and practical for growers). H-2A workers are cited often by growers in some regions of the country as being of current interest (or at least the topic which comes up most in conversations which I have had recently).

VARIABLES	(1) All Years	(2) 1989-1998	(3) 1999-2008	(4) 2009-2016
NEWCOMER BASED ON 12 MTHS DEFINITION	0.110	0.120	0.164	0.0273
	(0.00781)	(0)	(0.0152)	(0.00428)
Observations	66,462	22,473	27,726	16,263

Standard errors in parentheses
Source: NAWS and author calculations.

Recommendation: Create a nationally and regionally representative sample of H-2A workers. For example, I could envision following the design of the NAWS survey in which respondents answer the traditional NAWS questions plus a new module targeting information on the workings of the H-2A program specifically from the workers' perspective. This would provide a useful comparison sample, and also would be directly relevant to the primary purpose of the NAWS since monitoring agricultural employment and the characteristics of hired crop workers today should arguably include this group which was originally excluded.

Emerging Issue: Are employers getting in the way of NAWS and what do we really know about the ones matched to NAWS workers?

Unfortunately, there is a buzz in some of the farm communities recently that employers may pressure employees to respond to NAWS in certain ways. This has come up, for example, in my recent presentations of work using these data in cases where the audience has greater ties to the local agricultural community. I therefore ask, what, if anything, is known about this possible dynamic?

In addition to this perhaps extreme question, I am also interested in features of the employers and the specific farms on which NAWS workers work. The self-reported information may in some cases reflect

things like social desirability bias, and many of the questions are not nuanced enough to reveal much about true working conditions (e.g., binary questions about presence of field sanitation without observations as to the extent of compliance with federal regulations in terms of the features and qualities of these environmental aspects of work; similarly with housing; similarly with safety training and practice; etc.).

Recommendation: Conduct a matched employer survey and also surveyor-reported observational notes. A perhaps aspirational possibility for the NAWS would be to add an employer survey to accompany some NAWS cycles (e.g., I am envisioning a once a year supplement). This supplement could include establishment information such as whether the farm is a small or big operation, family-owned or corporate, etc. I am envisioning Census of Agriculture type information coupled with more detailed information about how employers find workers and what their labor needs and demands actually are and how they are changing (e.g., substitutions to more capital-intensive production? Changes to fertilizers and other inputs?). In addition, it would be extremely helpful for surveyors to make site visits to document details of the conditions on the farm. A surveyor observation module, for example, with details about the working environment on the farm from an objective perspective (e.g., information on field sanitation, occupational safety, housing, etc.) could provide meaningful data about real work conditions in a way that NAWS has not able to reach yet. Furthermore, observing interactions between NAWS workers and their employers using ethnographic type methods could be important for understanding if there is any pressure to misrepresent in the ways that have been reported in some circles.

Emerging Issue: Mental Health
Too little is known about mental health in farmwork populations. The NAWS mental health supplement seems to have only been conducted for two years of the 30-year history of this data source. This is an emerging issue being talked about more and more in agricultural communities. Little is also known about drug and alcohol use. The NAWS MH supplement in the 2009 and 2010 cycles was a good start to understanding these aspects of farm laborers' lives. However, the discontinuation of these questions clearly creates problems for researchers trying to learn about today's mental health needs in order to assess the needs for public and private services.

Recommendation: Reinstate the Mental Health module.

Emerging Issue: Food
Do workers eat during the day? What and when? This has direct implications for health. In development economics, food is often linked to the productivity value of labor due to relationships with physical and mental capacity and capability. Do we know anything about this?

Recommendation: Add questions on where, when, and what workers eat.

Emerging Issue: Remittances
Given the magnitudes of worker flows between Mexico and the U.S. and the history of labor market interdependencies, relatively little is known about remittances, and this is of policy interest. Sharma and Cardenas (2018), for example, conclude that the extent of remittances into Mexico is enough to induce changes in labor force participation rates and hours worked. The authors create a state-year panel for Mexico and primarily use data from National Accounts. While this type of aggregation is useful for their analysis, the microdynamics of remittances and the particular relevance for agricultural labor markets and credit in rural areas in the U.S. is left unknown. Understanding magnitudes and uses of remittances by U.S. farmworkers would help us better understand motivations of workers and thus better predict supply side dynamics. Use of banking? Use of money transfers? How much sent, and at what frequencies, and for what purposes? Savings behavior?

Recommendation: Add a module on remittances for foreign-born workers. I submitted possible questions/thoughts to DOL on remittances years ago and greatly would like to revisit this idea.

Final Thoughts

Another aspect of what I was interested in for this conference (but which I have not yet been able to tackle) is the representativeness of the sample across large and small farm employers in several crops/commodities. Several public policies in the U.S. hold exemptions for smaller scale employer operations (e.g., labor laws, minimum wages, etc.) and changing migration norms and patterns nationally and across regions over time may warrant future survey modifications toward the study of true micro-level dynamics and understanding how wellbeing, broadly defined, among farmworkers in the U.S. has changed and how equipped we are to understand these changes using the current data. While I had hoped that crop, task, and other variables in the confidential version would be illustrative of some of these features, I found the numbers of groupings and their mappings to true farm operations to be hard to determine. Presumably some information exists elsewhere as part of the employer level of the sampling frame and therefore provision of this information could be helpful in the case that my aspirational thoughts regarding adding an employer module are too far in the future.

References

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Table 1: Comparison between Regional Mappings

NAWS Public Use Sampling Regions ("REGION6")	NAWS Sampling Regions ("REGION12")	USDA Regions	States
California	**CA**	California	CA
Southwest	**MN3**	Mountain III	AZ, NM
	SP	Southern Plains	OK, TX
Northwest	**PC**	Pacific	OR, WA
	MN12	Mountain I	ID, MT, WY
		Mountain II	CO, NV, UT
Midwest	**CBNP**	Corn Belt I	IL, IN, OH
		Corn Belt II	IA, MO
		Northern Plains	KS, NE, ND, SD
	LK	Lake	MI, MN, WI
East	**AP12**	Appalachian I	NC, VA
		Appalachian II	KY, TN, WV
	NE1	Northeast I	CT, ME, MA, NH, NY, RI, VT
	NE2	Northeast II	DE, MD, NJ, PA
Southeast	**DLSE**	Delta	AR, LA, MS
		Southeast I	AL, GA, SC
	FL	Florida	FL

Source: Adaptation of "Correspondence between NAWS and USDA Farm Labor Survey sampling regions" (https://www.doleta.gov/naws/pages/methodology/) and NAWS Codebook.

Table 2: NAWS Regional Sampling Over Time, Fractions of Workers, by Region

	(1) **All Years**	(2) **1989-1998**	(3) **1999-2008**	(4) **2009-2016**
California				
California (CA)	0.317	0.263	0.349	0.357
	(0.0323)	(0)	(0.0473)	(0.0393)
Southwest				
Mountain 3 (MN3)	0.0229	0.0210	0.0225	0.0264
	(0.00393)	(0)	(0.00655)	(0.00498)
Southern Plains (SP)	0.0514	0.0498	0.0575	0.0459
	(0.00777)	(0)	(0.0130)	(0.00739)
Northwest				
Pacific Coast (PC)	0.0926	0.0811	0.0852	0.119
	(0.0126)	(0)	(0.0163)	(0.0160)
Mountain 1 and 2 (MN12)	0.0354	0.0327	0.0358	0.0390
	(0.00745)	(0)	(0.0108)	(0.00630)
Midwest				
Corn Belt and Northern Plains (CBNP)	0.118	0.121	0.120	0.112
	(0.0162)	(0)	(0.0193)	(0.0171)
Lake (LK)	0.0695	0.0961	0.0548	0.0490
	(0.0155)	(0)	(0.0100)	(0.00784)
East				
Appalachia 1 and 2 (AP12)	0.0837	0.103	0.0760	0.0652
	(0.0207)	(0)	(0.0207)	(0.0103)
Northeast 1 (NE1)	0.0296	0.0264	0.0332	0.0297
	(0.00564)	(0)	(0.00779)	(0.00515)
Northeast 2 (NE2)	0.0431	0.0509	0.0390	0.0369
	(0.0110)	(0)	(0.00793)	(0.00604)
Southeast				
Delta and Southeast (DLSE)	0.0735	0.0845	0.0673	0.0650
	(0.0164)	(0)	(0.0157)	(0.00811)
Florida (FL)	0.0626	0.0712	0.0589	0.0548
	(0.00795)	(0)	(0.00834)	(0.00825)
Observations	66,553	22,520	27,740	16,293

Standard errors in parentheses

Source: NAWS and author calculations.

Notes: Regional labels in **Bold** refer to the six regions of the "REGION6" variable which appears in the public use dataset. Regional labels in Plain text refer to the 12 regions of the "REGION12" variable in the confidential version of the dataset.

Table 3: Selected Worker Characteristics, by Region

	(1)	**(2)**	(3)	(4)	**(5)**	(6)	(7)	(8)
VARIABLES	**CA**	**Southwest**	MN3	SP	**Northwest**	PC	MN12	CO
WAGE, TASK 1	**7.765**	**6.960**	7.213	6.847	**8.330**	8.637	7.561	7.235
	(0.226)	**(0.236)**	(0.310)	(0.309)	**(0.299)**	(0.372)	(0.388)	(0.923)
Hours	**43.08**	**42.40**	44.84	41.31	**43.55**	42.37	46.52	43.92
	(0.533)	**(1.343)**	(0.865)	(1.856)	**(0.804)**	(0.828)	(1.689)	(1.388)
Female	**0.227**	**0.208**	0.207	0.209	**0.273**	0.256	0.315	0.309
	(0.0149)	**(0.0181)**	(0.0266)	(0.0233)	**(0.0217)**	(0.0248)	(0.0413)	(0.0377)
Age (years)	**34.34**	**37.52**	39.60	36.60	**33.86**	33.75	34.13	33.11
	(0.353)	**(0.508)**	(0.968)	(0.583)	**(0.459)**	(0.587)	(0.659)	(1.294)
Education (years)	**6.542**	**7.405**	7.068	7.555	**7.695**	7.157	9.042	8.923
	(0.0691)	**(0.178)**	(0.238)	(0.238)	**(0.215)**	(0.169)	(0.528)	(0.281)
Farm Experience (years)	**11.55**	**13.16**	14.67	12.48	**10.93**	11.08	10.57	10.32
	(0.311)	**(0.600)**	(0.954)	(0.766)	**(0.390)**	(0.506)	(0.494)	(0.948)
Observations	**21,865**	**4,930**	2,094	2,836	**8,135**	5,879	2,256	619

Standard errors in parentheses

Source: NAWS and author calculations.

Notes: Regional labels in **Bold** refer to the six regions of the "REGION6" variable which appears in the public use dataset. Regional labels in Plain text refer to the 12 regions of the "REGION12" variable in the confidential version of the dataset.

Table 3: Selected Worker Characteristics, by Region, Continued

	(9)	(10)	(11)	**(12)**	(13)	(14)	(15)	**(16)**	(17)	(18)
VARIABLES	**Midwest**	CBNP	LK	**East**	AP12	NE1	NE2	**Southeast**	DLSE	FL
WAGE, TASK 1	**7.506**	7.805	7.007	**7.241**	6.897	7.684	7.628	**7.045**	7.005	7.091
	(0.287)	(0.345)	(0.458)	**(0.326)**	(0.462)	(0.494)	(0.527)	**(0.249)**	(0.389)	(0.287)
Hours	**39.94**	40.81	38.47	**41.88**	40.73	41.75	44.25	**40.37**	40.86	39.81
	(0.833)	(1.168)	(1.078)	**(1.196)**	(1.890)	(1.521)	(1.394)	**(1.004)**	(1.792)	(0.814)
Female	**0.291**	0.263	0.338	**0.189**	0.179	0.283	0.145	**0.234**	0.177	0.299
	(0.0202)	(0.0201)	(0.0363)	**(0.0201)**	(0.0244)	(0.0472)	(0.0309)	**(0.0152)**	(0.0180)	(0.0233)
Age (years)	**32.53**	32.75	32.16	**32.85**	32.58	33.25	33.11	**33.68**	33.68	33.68
	(0.661)	(0.904)	(0.926)	**(0.759)**	(1.271)	(0.861)	(0.782)	**(0.767)**	(1.397)	(0.401)
Education (years)	**9.469**	9.586	9.275	**8.145**	8.197	8.867	7.555	**7.175**	8.017	6.218
	(0.257)	(0.354)	(0.351)	**(0.182)**	(0.259)	(0.335)	(0.258)	**(0.176)**	(0.402)	(0.135)
Farm Experience (years)	**9.223**	9.125	9.387	**9.056**	9.028	8.719	9.342	**10.37**	11.18	9.438
	(0.461)	(0.624)	(0.650)	**(0.585)**	(1.014)	(0.557)	(0.617)	**(0.694)**	(1.389)	(0.326)
Observations	**7,594**	4,583	3,011	**8,025**	3,713	1,710	2,602	**10,134**	3,641	6,493

Standard errors in parentheses

Source: NAWS and author calculations.

Notes: Regional labels in **Bold** refer to the six regions of the "REGION6" variable which appears in the public use dataset. Regional labels in Plain text refer to the 12 regions of the "REGION12" variable in the confidential version of the dataset.

Table 4: (Very) Basic Mincer Regressions, by Region

	(1) CA	(2) Southwest	(3) MN3	(4) SP	(5) Northwest	(6) PC	(7) MN12
Education (years)	**0.0655*** **	**0.0811*** **	0.0867***	0.0747***	**0.0780*** **	0.118***	0.0612**
	(0.00757)	**(0.0146)**	(0.0160)	(0.0191)	**(0.0276)**	(0.0342)	(0.0300)
Farm Experience (years)	**0.0893*** **	**0.0769*** **	0.0630***	0.0810***	**0.129*** **	0.138***	0.0847***
	(0.00914)	**(0.0141)**	(0.0185)	(0.0200)	**(0.0206)**	(0.0239)	(0.0257)
Experience Squared/100	**-0.116*** **	**-0.115*** **	-0.114***	-0.112***	**-0.165*** **	-0.182***	-0.0653
	(0.0194)	**(0.0277)**	(0.0361)	(0.0405)	**(0.0489)**	(0.0589)	(0.0630)
FISCAL YEAR = 1990	**0.305**	**0.448**	3.086***	-0.218	**-0.947**	-0.580	-1.115
	(0.279)	**(0.468)**	(0.584)	(0.171)	**(0.711)**	(0.676)	(0.698)
FISCAL YEAR = 1991	**0.280**	**0.706*** **	1.113***	0.569**	**1.350**	1.928	-0.719*
	(0.249)	**(0.201)**	(0.298)	(0.233)	**(1.929)**	(2.270)	(0.374)
FISCAL YEAR = 1992	**0.367**	**0.627*** **	0.855**	0.508**	**-0.108**	-0.0725	-0.535
	(0.222)	**(0.210)**	(0.410)	(0.250)	**(0.816)**	(0.932)	(0.393)
FISCAL YEAR = 1993	**0.425***	**0.853*** **	0.541***	0.975**	**0.499**	0.269	1.259
	(0.233)	**(0.278)**	(0.159)	(0.394)	**(0.899)**	(0.994)	(1.405)
FISCAL YEAR = 1994	**0.669***	**0.916*** **	1.596***	0.610***	**0.401**	-0.117	1.520
	(0.346)	**(0.241)**	(0.281)	(0.157)	**(0.769)**	(0.698)	(1.179)
FISCAL YEAR = 1995	**0.765** **	**1.777*** **	1.443***	1.903***	**0.625**	0.587	0.798
	(0.357)	**(0.420)**	(0.156)	(0.580)	**(0.708)**	(0.893)	(0.564)
FISCAL YEAR = 1996	**0.320**	**1.207*** **	1.177***	1.157***	**0.212**	-0.164	1.192
	(0.260)	**(0.188)**	(0.367)	(0.207)	**(0.642)**	(0.681)	(0.890)
FISCAL YEAR = 1997	**0.654*** **	**1.131*** **	1.517***	0.971***	**0.462**	0.317	0.785
	(0.193)	**(0.164)**	(0.292)	(0.137)	**(0.760)**	(0.927)	(0.538)
FISCAL YEAR = 1998	**1.234*** **	**1.749*** **	1.798***	1.655***	**1.006**	0.713	1.809**
	(0.170)	**(0.143)**	(0.345)	(0.123)	**(0.768)**	(0.917)	(0.872)
FISCAL YEAR = 1999	**1.535*** **	**3.614*** **	2.898***	3.903***	**1.127***	0.992	1.437***
	(0.232)	**(0.910)**	(0.563)	(1.222)	**(0.651)**	(0.760)	(0.454)
FISCAL YEAR = 2000	**1.714*** **	**2.108*** **	2.247***	2.083***	**1.590** **	1.209	2.447***
	(0.221)	**(0.232)**	(0.380)	(0.285)	**(0.710)**	(0.817)	(0.830)
FISCAL YEAR = 2001	**2.009*** **	**2.452*** **	2.629***	2.258***	**2.026*** **	1.898**	2.340***
	(0.202)	**(0.539)**	(0.389)	(0.750)	**(0.650)**	(0.734)	(0.499)
FISCAL YEAR = 2002	**2.502*** **	**2.001*** **	3.062***	1.682***	**1.550** **	1.675**	1.241**
	(0.214)	**(0.254)**	(0.265)	(0.170)	**(0.653)**	(0.711)	(0.603)

FISCAL YEAR = 2003	**2.610*** **	**2.441*** **	2.957***	2.342***	**2.007*** **	2.197***	1.658***
	(0.276)	**(0.312)**	(0.475)	(0.336)	**(0.707)**	(0.746)	(0.565)
FISCAL YEAR = 2004	**2.855*** **	**2.559*** **	2.247***	2.696***	**2.087*** **	1.964***	2.266***
	(0.297)	**(0.358)**	(0.673)	(0.362)	**(0.651)**	(0.716)	(0.609)
FISCAL YEAR = 2005	**2.623*** **	**2.589*** **	2.348***	2.714***	**2.449*** **	2.445***	2.547***
	(0.223)	**(0.247)**	(0.305)	(0.351)	**(0.709)**	(0.802)	(0.587)
FISCAL YEAR = 2006	**2.724*** **	**3.384*** **	3.021***	3.542***	**2.487*** **	2.855***	1.446***
	(0.299)	**(0.245)**	(0.534)	(0.259)	**(0.813)**	(0.918)	(0.353)
FISCAL YEAR = 2007	**3.710*** **	**3.236*** **	3.383***	3.181***	**3.369*** **	3.716***	2.650***
	(0.297)	**(0.254)**	(0.328)	(0.316)	**(0.739)**	(0.740)	(0.527)
FISCAL YEAR = 2008	**3.666*** **	**4.572*** **	3.915***	4.813***	**3.480*** **	3.823***	2.629***
	(0.196)	**(0.427)**	(0.518)	(0.517)	**(0.828)**	(0.839)	(0.404)
FISCAL YEAR = 2009	**3.965*** **	**4.597*** **	4.213***	4.748***	**3.897*** **	3.774***	4.062***
	(0.292)	**(0.522)**	(1.278)	(0.514)	**(0.769)**	(0.889)	(0.502)
FISCAL YEAR = 2010	**3.948*** **	**4.385*** **	4.642***	4.232***	**4.021*** **	4.673***	2.757***
	(0.368)	**(0.457)**	(0.874)	(0.531)	**(0.964)**	(0.970)	(0.533)
FISCAL YEAR = 2011	**3.449*** **	**4.412*** **	3.968***	4.581***	**3.457*** **	3.266***	3.927***
	(0.201)	**(0.234)**	(0.410)	(0.269)	**(0.654)**	(0.765)	(0.399)
FISCAL YEAR = 2012	**3.913*** **	**5.110*** **	4.776***	5.242***	**3.737*** **	3.338***	4.646***
	(0.323)	**(0.536)**	(0.571)	(0.823)	**(0.637)**	(0.735)	(0.514)
FISCAL YEAR = 2013	**4.412*** **	**4.489*** **	4.688***	4.346***	**4.648*** **	4.426***	4.860***
	(0.293)	**(0.282)**	(0.535)	(0.360)	**(0.668)**	(0.738)	(0.965)
FISCAL YEAR = 2014	**4.805*** **	**4.789*** **	4.595***	4.924***	**4.791*** **	4.525***	5.211***
	(0.293)	**(0.384)**	(0.646)	(0.518)	**(0.804)**	(0.966)	(0.515)
FISCAL YEAR = 2015	**5.253*** **	**4.761*** **	4.669***	4.795***	**4.656*** **	4.771**	4.198***
	(0.271)	**(0.252)**	(0.551)	(0.214)	**(1.465)**	(1.840)	(0.671)
FISCAL YEAR = 2016	**5.453*** **	**5.236*** **	4.325***	5.998***	**5.381*** **	4.807***	7.135***
	(0.310)	**(0.556)**	(0.822)	(0.541)	**(0.654)**	(0.739)	(0.750)
Constant	**4.032*** **	**2.959*** **	3.224***	2.911***	**4.332*** **	4.286***	3.992***
	(0.179)	**(0.187)**	(0.266)	(0.256)	**(0.655)**	(0.754)	(0.462)
Observations	**22,696**	**5,235**	2,264	2,971	**8,500**	6,137	2,363
R-squared	**0.454**	**0.424**	0.349	0.484	**0.353**	0.368	0.415

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: NAWS and author calculations.

Table 4: (Very) Basic Mincer Regressions, by Region, Continued

	(8)	(9)	(10)	**(11)**	(12)	(13)	(14)	**(15)**	(16)	(17)
	Midwest	CBNP	LK	**East**	AP12	NE1	NE2	**Southeast**	DLSE	FL
Education (years)	**0.122*** **	0.126***	0.115***	**0.104*** **	0.121***	0.113***	0.109***	**0.0510*** **	0.0428	0.0697***
	(0.0147)	(0.0179)	(0.0251)	**(0.0185)**	(0.0246)	(0.0152)	(0.0345)	**(0.0159)**	(0.0293)	(0.0182)
Farm Experience (years)	**0.157*** **	0.176***	0.133***	**0.0904*** **	0.0711***	0.113***	0.107***	**0.0690*** **	0.0524**	0.0934***
	(0.0163)	(0.0194)	(0.0260)	**(0.0132)**	(0.0169)	(0.0189)	(0.0306)	**(0.0154)**	(0.0204)	(0.0229)
Experience Squared/100	**-0.222*** **	-0.249***	-0.199***	**-0.127*** **	-0.0885***	-0.168***	-0.128	**-0.120*** **	-0.0811**	-0.170***
	(0.0356)	(0.0431)	(0.0539)	**(0.0275)**	(0.0331)	(0.0463)	(0.0805)	**(0.0329)**	(0.0382)	(0.0544)
FISCAL YEAR = 1990	**0.232**	0.637***	0.530	**0.787** **	0.703	-0.339**	1.374*	**-0.166**	-0.167	0.171
	(0.331)	(0.236)	(0.482)	**(0.350)**	(0.529)	(0.149)	(0.697)	**(0.159)**	(0.111)	(0.340)
FISCAL YEAR = 1991	**0.242**	-0.0647	0.686***	**1.048** **	0.701***	-0.481**	4.100***	**0.0182**	-0.906***	0.483
	(0.338)	(0.527)	(0.226)	**(0.527)**	(0.174)	(0.185)	(0.445)	**(0.537)**	(0.188)	(0.325)
FISCAL YEAR = 1992	**0.576**	0.00772	1.120***	**1.255*** **	0.728***	1.204***	4.369***	**0.778** **	0.0188	0.725*
	(0.362)	(0.458)	(0.411)	**(0.394)**	(0.229)	(0.315)	(0.445)	**(0.345)**	(0.161)	(0.383)
FISCAL YEAR = 1993	**1.104*** **	1.210***	0.836***	**1.065** **	1.305*	0.621***	0.920***	**0.666***	0.907*	0.288
	(0.224)	(0.203)	(0.239)	**(0.445)**	(0.706)	(0.183)	(0.0465)	**(0.376)**	(0.500)	(0.444)
FISCAL YEAR = 1994	**0.811*** **	0.822***	0.939***	**1.405*** **	1.400**	1.077***	1.485***	**0.147**	0.568***	-0.420
	(0.158)	(0.168)	(0.212)	**(0.338)**	(0.625)	(0.174)	(0.145)	**(0.255)**	(0.202)	(0.349)
FISCAL YEAR = 1995	**0.752***	0.814**	0.821	**1.612*** **	1.563**	1.144**	1.866***	**1.099***	1.850*	0.448
	(0.405)	(0.404)	(0.626)	**(0.405)**	(0.729)	(0.432)	(0.435)	**(0.557)**	(0.979)	(0.428)
FISCAL YEAR = 1996	**0.979*** **	0.691*	1.531***	**2.040*** **	2.224**	2.198***	1.621***	**0.867** **	1.076**	0.603*
	(0.317)	(0.350)	(0.329)	**(0.587)**	(0.883)	(0.473)	(0.137)	**(0.335)**	(0.460)	(0.332)
FISCAL YEAR = 1997	**1.576*** **	1.141***	2.245***	**1.002*** **	1.081***	0.950***	0.935***	**1.333*** **	1.615***	0.933***
	(0.320)	(0.343)	(0.264)	**(0.202)**	(0.360)	(0.292)	(0.301)	**(0.335)**	(0.454)	(0.327)
FISCAL YEAR = 1998	**1.580*** **	1.380***	1.967***	**1.561*** **	1.808***	1.660***	1.124***	**1.435*** **	1.622***	1.206***
	(0.291)	(0.217)	(0.509)	**(0.155)**	(0.203)	(0.221)	(0.202)	**(0.279)**	(0.370)	(0.328)
FISCAL YEAR = 1999	**1.595*** **	1.374***	1.966***	**3.196*** **	3.463***	2.082***	3.382***	**1.412*** **	1.850***	1.009***
	(0.273)	(0.273)	(0.386)	**(0.624)**	(1.000)	(0.263)	(0.445)	**(0.275)**	(0.455)	(0.330)
FISCAL YEAR = 2000	**2.854*** **	2.790***	2.913***	**2.110*** **	1.885***	2.676***	2.322***	**1.958*** **	1.995***	1.810***
	(0.422)	(0.492)	(0.502)	**(0.272)**	(0.346)	(0.336)	(0.530)	**(0.263)**	(0.321)	(0.405)
FISCAL YEAR = 2001	**2.922*** **	2.841***	3.065***	**2.844*** **	3.058***	2.542***	2.788***	**2.320*** **	2.541***	2.015***
	(0.482)	(0.622)	(0.451)	**(0.298)**	(0.497)	(0.450)	(0.280)	**(0.386)**	(0.271)	(0.698)
FISCAL YEAR = 2002	**2.955*** **	2.995***	2.827***	**3.094*** **	3.701***	2.994***	2.202***	**1.995*** **	2.257***	1.715***
	(0.427)	(0.509)	(0.457)	**(0.341)**	(0.454)	(0.313)	(0.438)	**(0.231)**	(0.234)	(0.403)

FISCAL YEAR = 2003	**2.912*** **	2.772***	3.109***	**3.484*** **	3.315***	3.561***	3.693***	**1.887*** **	1.768***	2.194***
	(0.351)	(0.410)	(0.370)	**(0.319)**	(0.444)	(0.494)	(0.440)	**(0.353)**	(0.348)	(0.395)
FISCAL YEAR = 2004	**3.238*** **	3.094***	3.554***	**3.357*** **	2.946***	4.124***	3.946***	**2.588*** **	2.453***	2.727***
	(0.339)	(0.387)	(0.374)	**(0.372)**	(0.384)	(0.449)	(0.359)	**(0.498)**	(0.362)	(0.938)
FISCAL YEAR = 2005	**3.715*** **	4.027***	2.912***	**3.579*** **	3.189***	3.777***	4.448***	**3.060*** **	3.932**	1.906***
	(0.865)	(1.082)	(0.426)	**(0.361)**	(0.399)	(0.383)	(0.806)	**(1.022)**	(1.651)	(0.438)
FISCAL YEAR = 2006	**3.974*** **	3.538***	4.915***	**4.201*** **	3.508***	4.233***	5.706***	**3.111*** **	3.030***	3.093***
	(0.556)	(0.667)	(0.820)	**(0.501)**	(0.532)	(0.665)	(1.064)	**(0.288)**	(0.404)	(0.371)
FISCAL YEAR = 2007	**4.257*** **	4.208***	4.305***	**4.014*** **	4.258***	4.480***	3.583***	**2.845*** **	3.071***	2.567***
	(0.415)	(0.460)	(0.663)	**(0.380)**	(0.564)	(0.578)	(0.548)	**(0.302)**	(0.311)	(0.541)
FISCAL YEAR = 2008	**4.129*** **	3.463***	5.536***	**4.729*** **	4.533***	3.967***	5.845***	**3.881*** **	4.251***	3.422***
	(0.549)	(0.561)	(0.681)	**(0.350)**	(0.361)	(0.331)	(0.864)	**(0.307)**	(0.504)	(0.333)
FISCAL YEAR = 2009	**4.564*** **	4.387***	4.857***	**4.966*** **	5.178***	5.080***	4.309***	**4.455*** **	5.071***	3.497***
	(0.395)	(0.489)	(0.372)	**(0.418)**	(0.707)	(0.364)	(0.680)	**(0.326)**	(0.392)	(0.341)
FISCAL YEAR = 2010	**4.331*** **	4.091***	5.070***	**4.750*** **	4.011***	5.069***	6.008***	**4.116*** **	4.120***	4.078***
	(0.406)	(0.455)	(0.746)	**(0.473)**	(0.631)	(0.397)	(0.913)	**(0.486)**	(0.448)	(0.904)
FISCAL YEAR = 2011	**4.777*** **	4.991***	4.371***	**4.303*** **	3.120***	5.267***	6.129***	**5.010*** **	4.953***	5.014***
	(0.529)	(0.590)	(0.435)	**(0.673)**	(0.640)	(0.716)	(0.441)	**(0.443)**	(0.655)	(0.509)
FISCAL YEAR = 2012	**4.590*** **	4.345***	4.954***	**5.590*** **	5.269***	5.041***	6.075***	**4.086*** **	3.993***	4.216***
	(0.413)	(0.512)	(0.355)	**(0.461)**	(0.548)	(0.491)	(0.877)	**(0.547)**	(0.723)	(0.612)
FISCAL YEAR = 2013	**6.022*** **	6.006***	6.063***	**5.166*** **	5.608***	4.642***	4.938***	**4.463*** **	4.978***	3.876***
	(0.539)	(0.518)	(1.032)	**(0.451)**	(0.602)	(0.273)	(1.089)	**(0.390)**	(0.596)	(0.502)
FISCAL YEAR = 2014	**6.035*** **	5.980***	6.050***	**5.620*** **	5.548***	6.115***	5.113***	**4.368*** **	4.353***	4.261***
	(0.553)	(0.665)	(0.873)	**(0.467)**	(0.835)	(0.276)	(0.631)	**(0.275)**	(0.267)	(0.405)
FISCAL YEAR = 2015	**5.823*** **	5.958***	5.317***	**5.934*** **	5.645***	5.552***	6.572***	**5.432*** **	5.897***	4.835***
	(0.379)	(0.427)	(0.425)	**(0.483)**	(0.792)	(0.706)	(0.755)	**(0.594)**	(0.767)	(0.900)
FISCAL YEAR = 2016	**6.056*** **	6.136***	5.813***	**5.596*** **	5.404***	6.334***	5.508***	**4.612*** **	4.853***	4.279***
	(0.477)	(0.704)	(0.377)	**(0.358)**	(0.396)	(0.440)	(0.767)	**(0.359)**	(0.514)	(0.400)
Constant	**2.650*** **	2.726***	2.438***	**2.870*** **	2.704***	2.761***	2.791***	**3.948*** **	3.840***	4.022***
	(0.315)	(0.352)	(0.398)	**(0.260)**	(0.387)	(0.303)	(0.377)	**(0.207)**	(0.297)	(0.367)
Observations	**7,922**	4,733	3,189	**8,326**	3,852	1,777	2,697	**10,690**	3,816	6,874
R-squared	**0.514**	0.511	0.538	**0.450**	0.496	0.607	0.440	**0.365**	0.400	0.356

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: NAWS and author calculations.