Seasonality

by Nels Tomlinson and
Lorraine Cordova, Labor Economists

The ups and downs of the Alaska labor market

Alaska's economy is highly seasonal, compared to states in more southern latitudes. In the cold of winter, industries such as construction, seafood processing, and tourism shift into lower gear. Yet, to answer questions such as: "What portion of Alaska's economy is seasonal?" and "Which occupations are seasonal?" is no simple task. It is common knowledge that most seafood processing and tourism jobs are seasonal. But in many cases there is no clear distinction between a job that is seasonal and one that is not. Rather, it is a matter of gradations of seasonality.

Seasonal jobs contribute to cyclic periods of high unemployment which can draw heavily on unemployment insurance coffers. Knowing which occupations are seasonal can help in targeting training programs, and in evaluating their effectiveness.

Seasonal occupations

This article introduces a method for classifying occupations by seasonality, and identifies the number of workers in these occupations. Each job is coded as belonging to a single occupation. (See Methodology, page 8.) In this article an occupation is a specific job as described in the Standard Occupational Classification Manual. Seasonal occupations are those in which an unusually large proportion of the workers work for only part of the year. However, even in a seasonal occupation, some workers may work all of the year.

Defining seasonal occupations

Seasonal occupations have two distinguishing characteristics:

1. considerable variation in the number of employees from one period to the next, (example: from quarter to quarter) and
2. a seasonal pattern to the variation (example: high periods of employment occur in the same quarter each year).

These characteristics can be expressed in terms of a seasonality index. The difference in the number of workers employed from one quarter to the next and the

Seasonal Groups 1999–2002

Seasonal Group	Quarterly Workers Number	Quarterly Workers Percent	Quarterly Wages Total($M)	Quarterly Wages Percent	Quarterly Wages Average	Occupations
Non-Seasonal	48,640	15.4%	$462	20.2%	$9,498	156
Minimally Seasonal	35,570	11.3%	$292	12.8%	$8,209	116
Moderately Seasonal	141,521	44.8%	$1,050	46.0%	$7,419	308
Highly Seasonal	90,303	28.6%	$478	20.9%	$5,293	74
Totals	316,033	100.0%	$2,282	100.0%	$7,221	654

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section

consistency of the low and high quarters from year to year comprise the seasonality index. (See Methodology, page 8.)

Alaska employers classified their workers into nearly 800 occupations on their Quarterly Unemployment Insurance reports to the Department of Labor and Workforce Development during the period 1999 through 2002. Of these, 654 occupational classifications averaged more than 10 workers per quarter. These 654 occupations were used to examine seasonality in the workforce. They were divided into four groups by degree of seasonality. (See Exhibit 1.)

Highly seasonal occupations have a strong seasonal pattern and large fluctuation in number of workers from one quarter to the next. There were 74 occupation classifications in the highly seasonal group. Most of these occupations are associated with the seafood, tourism, or construction industries. The group includes Seafood Processing Workers, as well as some other obvious candidates such as Waiters and Waitresses, Construction Laborers, and Carpenters. Workers in this group have average earnings of $5,293 per quarter, much lower than the average quarterly earnings of $7,221 for all workers in the state.

Moderately seasonal occupations have a strong seasonal pattern but less change in number of workers from quarter to quarter. The moderately seasonal group has the largest number of employees and occupations, with 308 occupations and 44.8 percent of all workers. The group includes occupations in the education industry such as Teacher Assistants and Teachers & Instructors. Some Office Clerks, Retail Salespersons, and Food Preparation & Service Workers also appear here. Workers in this group earn an average of $7,419 per quarter, which is slightly higher than the average quarterly earnings for all workers in the state.

Minimally seasonal occupations vary somewhat in number of workers but show little or no seasonal pattern. This group contains 116 occupations. Minimally seasonal occupations include Sales and Related Workers, Maintenance and Repair Workers, and Nursing Aides. Workers in this group have average quarterly earnings of $8,209 per quarter, almost 14 percent higher than the average quarterly earnings for all workers in the state of $7,221.

Non-seasonal occupations have little variation in the number of workers and little or no seasonal pattern. The non-seasonal group contains 156 occupation classifications. This group includes many office workers, along with Airline Pilots and Roustabouts in the oil and gas industry. Workers in this group have average quarterly earnings of $9,498, a full one-third higher than the average quarterly earnings for all workers in the state.

Occupations found in multiple industries

The seasonal characteristics of an occupation vary depending on the industry, (using the Standard Industrial Classification system.) Sometimes an occupation will fall in multiple industry classifications, and in a different seasonality group in each. For example, retail sales workers employed in general merchandise stores have highly seasonal jobs, while the jobs of retail sales workers in apparel and accessory stores are minimally seasonal.

A single industry will usually have occupations in more than one seasonal category. In the construction industry, for instance, Laborers typically perform their work outside when weather permits. Theirs is a highly seasonal occupation. Bookkeepers working for a construction company are typically employed year-round and would not exhibit the same seasonal patterns as the Laborers employed by the same company.

Occupation/industry combinations were examined for a closer look at seasonality. More than 3,000 unique occupation/industry combinations were reported in the last four years.

Occupation/industry combinations that averaged fewer than 10 employees per quarter were omitted from this part of the analysis since results from such small samples can give misleading conclusions. For each occupation/industry combination we constructed measures of variability and seasonal pattern.

Exhibit 2 shows seasonality information for several industries of particular interest in Alaska. Seafood processing and construction are quite seasonal in nature, and employ large numbers of workers. Education services and health and social services each employ almost as many workers as seafood and construction together, but are less seasonal. Oil and gas employs fewer workers than the aforementioned industries, but their jobs tend to be non-seasonal and highly paid. In each of these five industries, we see confirmation of the general trend that the more seasonal occupations have lower quarterly earnings.

Seafood processing and construction are highly seasonal

Seafood processing shows 74 percent of its workers in highly seasonal occupations, and they earn 64 percent of the wages in the industry. (See Exhibit 2.) Few seafood processing workers were employed year-round; in fact, 71 percent of them were nonresidents of Alaska in 2001, (as defined in the publication Non-Residents Working in Alaska) and 73 percent were in highly seasonal occupations. It appears likely that most of the highly seasonal jobs in seafod processing are held by nonresidents.

The construction industry, including special trades, building construction, and heavy construction other than building, shows 51 percent of its workers in highly seasonal occupations. These workers earn 46 percent of the wages in the industry.

Seasonality of Select Industries 1999—2002 2

	Avg. Quarterly Workers		Avg. Quarterly Wages		Occu-
	Number	Percent	Wages (000s)	Percent	pations
Seafood Processing					
Non-Seasonal	0	0.0%	$0	0.0%	0
Minimally Seasonal	1,325	12.3%	$8,854	17.4%	31
Moderately Seasonal	1,485	13.8%	$9,493	18.7%	30
Highly Seasonal	7,968	73.9%	$32,467	63.9%	15
Totals	10,778	100.0%	$50,814	100.0%	76
Construction					
Non-Seasonal	472	2.3%	$4,378	2.6%	12
Minimally Seasonal	3,020	14.8%	$27,908	16.7%	72
Moderately Seasonal	6,475	31.7%	$58,831	35.2%	71
Highly Seasonal	10,432	51.1%	$76,185	45.5%	30
Totals	20,399	100.0%	$167,302	100.0%	185
Education Services					
Non-Seasonal	2,424	8.5%	$17,764	8.7%	24
Minimally Seasonal	10,221	35.8%	$81,290	40.0%	57
Moderately Seasonal	14,453	50.7%	$100,414	49.4%	48
Highly Seasonal	1,429	5.0%	$3,710	1.8%	5
Totals	28,527	100.0%	$203,178	100.0%	134
Health and Social Services					
Non-Seasonal	7,961	27.0%	$53,100	24.9%	67
Minimally Seasonal	12,092	41.0%	$80,165	37.6%	111
Moderately Seasonal	9,360	31.8%	$79,489	37.3%	60
Highly Seasonal	50	0.2%	$399	0.2%	2
Totals	29,463	100.0%	$213,153	100.0%	240
Oil and Gas					
Non-Seasonal	3,884	34.6%	$64,650	32.8%	27
Minimally Seasonal	4,404	39.2%	$79,494	40.3%	60
Moderately Seasonal	2,937	26.2%	$52,940	26.9%	32
Highly Seasonal	0	0.0%	$0	0.0%	0
Totals	11,225	100.0%	$197,084	100.0%	119

Note: The quarterly worker count and wages is the average of the number of unique employer/worker combinations for calendar years 1999–2002.

Source: Alaska Department of Labor & Workforce Development, Research & Analysis Section

Education services only moderately seasonal

The education services industry has occupations in all four of the seasonal groupings, but the majority are in the moderately seasonal group. (See Exhibit 2.) In education services some office workers are employed year-round while others are hired for the school session only. Five percent of the employees in this group are in highly seasonal occupations, and these employees earn only two percent of the wages in the industry.

Health and social services is minimally seasonal

Most health and social services industry occupations are minimally seasonal. Healthcare practitioner and technical occupations along with healthcare support and office and administrative occupations make up the bulk of the minimally seasonal employment. During the busy tourist season the healthcare system faces increased demands and staff must be ready for the influx of summer visitors. Very few of the employees in this industry are in highly seasonal occupations.

Oil and gas extraction is mostly non-seasonal

Construction and extraction occupations along with architectural and engineering occupations make up the bulk of the oil and gas extraction industry employment. Most of the occupations in this industry are minimally-seasonal although some do exhibit seasonal characteristics. (See Exhibit 2.) Construction work is generally highly seasonal, but construction workers in the oil and gas extraction industry have year-round jobs, with little variation in the number of workers. The oil and gas industry contains no highly seasonal occupations.

Top ten highly seasonal occupations

Exhibit 3 shows the average number of workers for the years 1999 through 2002, and the maximum and minimum quarterly employment for 2002. In the highly seasonal group, most of the top ten occupations are unskilled or semi-skilled. This group shows considerable variation between the maximum and minimum employment. For seafood processing, employment in the lowest quarter is only 41 percent of peak employment. For Construction Laborers, minimum employment is only 54 percent of peak employment. A significant number of workers in highly seasonal industries are nonresidents.

The top ten occupations in the moderately seasonal group show a broader mix of skill levels. Counter Attendants and Office Clerks are at one extreme, and General and Operations Managers and Executive Secretaries at the other. The greatest difference between peak and minimum employment in this list is 70 percent for Operating Engineers.

In the minimally seasonal group a broad range of skill levels appears; this group includes Sales and Related workers along with Elementary and Secondary Teachers. In this group there is generally less variation between the peak and minimum quarter's employment. Nursing Aides, Orderlies, & Attendants shows the greatest variation with 70 percent difference between the maximum and minimum.

In the non-seasonal group we see another broad range of skill levels. Customer Service Representatives and Office & Administrative Support Workers are on one end of the scale and Chief Executives and Police & Sheriff's Patrol Officers are on the other end. Roustabouts demonstrated the greatest variation between high and low quarterly employment with 74 percent of the peak.

Does seasonal employment imply low wages? A cautionary note

Employment in the highly seasonal and moderately seasonal occupations comprises nearly three quarters of total workers in the average quarter, but only two thirds of average quarterly wages. Even more telling is that the non-seasonal occupations represent 15 percent of average

Top Ten Occupations by Seasonality Group
Alaska

3

	Quarterly Worker Count			Average Quarterly Wages (000s)
	Average	Maximum	Minimum	
HIGHLY SEASONAL GROUP				
Seafood Processing Workers, Except Surimi and Fish Roe	7,884	11,909	4,904	$29,269
Laborers and Freight, Stock, and Material Movers, Hand	6,374	7,463	5,343	$25,573
Construction Laborers	5,497	6,946	3,740	$34,278
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	6,259	6,460	6,057	$23,564
Combined Food Preparation & Serving Workers, Incl. Fast Food	5,811	6,281	5,181	$10,605
Waiters and Waitresses	5,058	5,857	4,185	$12,362
Bookkeeping, Accounting, and Auditing Clerks	4,573	4,776	4,419	$30,139
Maids and Housekeeping Cleaners	3,467	4,297	2,623	$10,874
Carpenters	4,104	4,814	3,279	$31,038
All Other Highly Seasonal Occupations	41,278	48,832	33,008	$270,224
MODERATELY SEASONAL GROUP				
Retail Salespersons	12,760	13,923	11,301	$50,746
Office Clerks, General	8,248	8,688	7,636	$42,365
Cashiers	6,256	6,881	5,500	$17,155
Maintenance and Repair Workers, General	3,518	3,741	3,347	$26,031
Executive Secretaries and Administrative Assistants	3,792	3,910	3,631	$25,959
Operating Engineers and Other Construction Equipment Operators	3,326	3,794	2,671	$40,861
General and Operations Managers	3,508	3,652	3,329	$48,829
Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	2,049	2,376	1,840	$6,350
Stock Clerks and Order Fillers	2,445	2,592	2,288	$9,687
Secretaries, Except Legal, Medical, and Executive	2,328	2,416	2,097	$13,793
All Other Moderately Seasonal Occupations	93,293	103,280	82,484	$764,685
MINIMALLY SEASONAL GROUP				
Teacher Assistants	6,378	6,974	5,232	$23,501
Elementary School Teachers, Except Special Education	3,806	3,974	3,605	$42,180
Sales and Related Workers, All Other	2,397	2,493	2,235	$11,569
Teachers and Instructors, All Other	2,344	2,675	2,024	$14,324
Secondary School Teachers, Exc. Spec. & Vocational Ed.	1,589	1,629	1,500	$15,288
Nursing Aides, Orderlies, and Attendants	1,768	1,942	1,371	$9,896
Retail Sales Workers, Supervisors/First Line Managers	1,219	1,284	1,156	$9,883
Engineers, All Other	900	956	863	$17,224
Information and Record Clerks, All Other	818	890	718	$5,815
Shipping, Receiving, and Traffic Clerks	723	773	681	$4,349
All Other Minimally Seasonal Occupations	13,629	15,559	11,682	$137,633
NON-SEASONAL GROUP				
Managers, All Other	3,068	3,162	2,886	$40,079
Customer Service Representatives	3,394	3,526	3,211	$17,932
Office and Administrative Support Workers, All Other	3,192	3,467	2,919	$19,019
Office and Administrative Support Workers, Spvs/Mgrs	1,774	1,790	1,768	$17,266
Chief Executives	1,512	1,543	1,471	$31,689
Roustabouts, Oil and Gas	1,212	1,325	986	$13,794
Administrative Services Manager	1,391	1,432	1,341	$16,010
Financial Specialists, All Other	1,246	1,296	1,184	$11,923
Police and Sheriff's Patrol Officers	1,226	1,265	1,203	$15,497
Business Operations Specialists, All Other	1,171	1,210	1,133	$14,485
All Other Non-Seasonal Occupations	29,455	31,906	26,669	$264,130

Note: The average quarterly worker count and average quarterly wages are for calendar years 1999 through 2002. The maximum and minimum worker count is for 2002.

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section

quarterly employment and 20 percent of average quarterly wages. The minimally seasonal and non-seasonal groups when added together represent scarcely 27 percent of the individuals working in the state but they capture 33 percent of average quarterly wages. (See Exhibit 1.)

At first glance, quarterly earnings data seem to indicate that highly seasonal workers are among the lowest paid workers in the state, since they show the lowest earnings of the four groups. However, the methods for collecting the data make average seasonal earnings appear lower than they really are. There are quarters in which a worker may be employed for only a short period of time, but his wages are averaged over the whole quarter. A worker who holds multiple jobs or works for multiple employers or in multiple occupation classifications during the year will be counted more than once.

An extreme example of how seasonal employment might create a false impression of low wages follows: A seafood processing worker is hired for the season in late June. The worker is paid $100 in June, and thus has a few days' wages for the second quarter ending June 30th. The worker has a full quarter's wages of $3,000 for the third quarter, and only one week's wages of $100 for the fourth quarter. Adding the worker's wages for the three quarters and dividing by three, gives us average wages per quarter of $1,067, roughly one-third of the actual wages for a full quarter.

Some highly seasonal occupations are well paid. Even with the partial quarter effect described above, average wages per quarter for construction workers are in the higher ranges, comparable to those of the minimally seasonal group. Work in the construction trades is skilled, compared to seafood processing or waiter and waitress classifications.

Seasonality makes a difference

Nearly one in three workers in the state is in a highly seasonal occupation. Combined, these workers earn roughly one fifth of total average quarterly wages. Workers in moderately seasonal occupations make up another 45 percent earning 46 percent of the wage income. Thus, while only one third of employees work in highly seasonal occupations, nearly three quarters of the state's workers are in occupations that have some seasonal characteristics. Workers in the minimally seasonal and non-seasonal occupations make up the remainder (26 percent) and earn 33 percent of the total average quarterly wages.

Methodology

Using occupation and wage data gathered from Alaska's Quarterly Contribution Reports for workers eligible for unemployment insurance for the calendar years 1999 through 2002, we developed a method for classifying occupations according to their seasonal characteristics. For each occupation that had an average of at least 10 workers per quarter over the four-year period, we measured the variation in the number of workers per quarter, and in how many different quarters peak employment fell. Peak employment could fall into one, two, three, or four different quarters. If peak employment always occurs in the same quarter, there is a strong seasonal pattern. If peak employment falls in a different quarter every year, there is no discernible seasonal pattern. We used a procedure called k-means clustering to classify each occupation into one of the four groups. The amount of variation and the strength of the seasonal pattern determined how each occupation fit into a group.