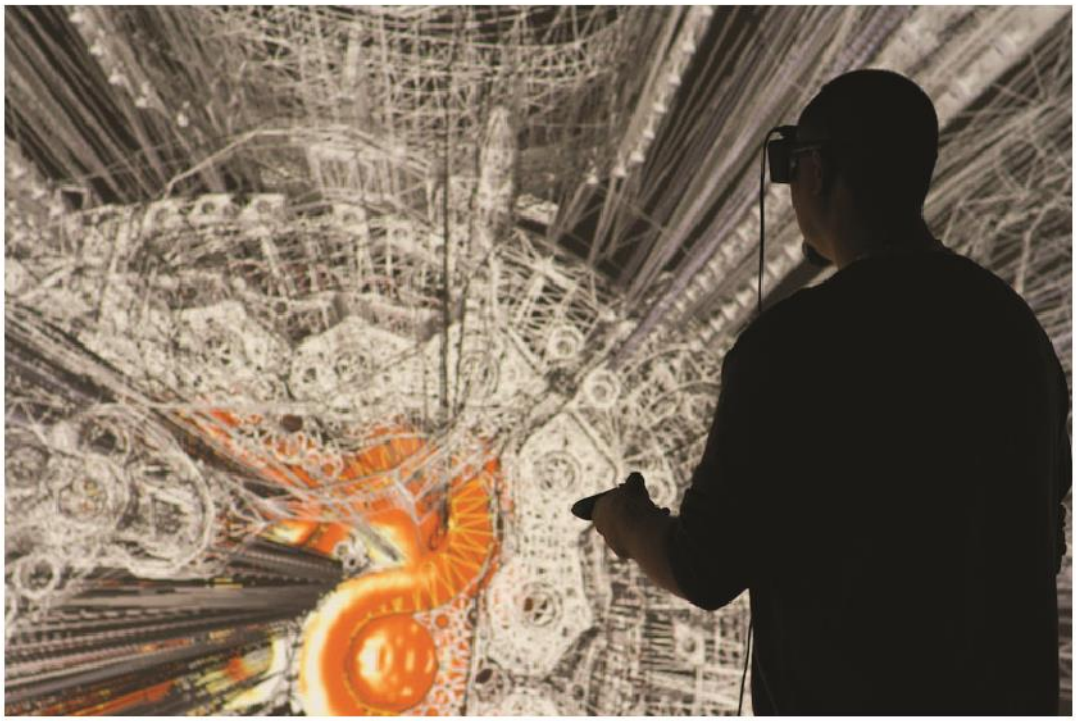
Business Scan

IDAHO DEPT. OF LABOR

Scientific Research & Development Industry and Idaho's Nuclear Cluster



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C.L. "Butch" Otter, Governor · Kenneth D. Edmunds, Director

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Executive Summary

Idaho's nuclear cluster is a major source of employment in scientific research and development. This industry is directly responsible for over 6,600 jobs throughout the state, though the jobs are primarily in eastern Idaho. Employment trends are tied closely to federal funding at the Idaho National Laboratory and its contractors.

Average earnings for workers in the scientific research and development industry are significantly higher at over $99,000 annually than the Idaho average for all industries at just under $45,000. These higher wages are often the result of advanced education and training.

Idaho's scientific research and development employment concentration is higher than every state but New Mexico. In 2013, scientific research and development jobs were more than three times more prevalent in Idaho than nationally. New Mexico's concentration was almost nine times the nation's. Both states are home to federally funded national laboratories that specialize in nuclear materials.

The industry's aging workforce will provide career opportunities for younger workers as older workers begin to retire. Between 1991 and 2011 the share of Idaho's 45 and older workers increased from 34 percent to over 60 percent. Many of these older workers are set to retire in the coming years.

Eastern Idaho continues to lead Idaho as a stronghold for scientific research and development jobs. The economic benefits are significant but leave the area dependent on federal funding. According to a Boise State University economic impact study, about 25 percent of eastern Idaho's employment is created or sustained by Idaho National Laboratory operations.

Scientific R&D Industry and Idaho's Nuclear Cluster

Industry Analysis

Idaho's scientific research and development industry is defined by its prominent nuclear cluster. No clear taxonomy is available for nuclear-related businesses, but most of Idaho's are involved in scientific research and development of some sort.

INDUSTRY BACKGROUND

Although Idaho was home to the Experimental Breeder Reactor I, the world's first electricity producing power plant, power production is not the purpose of nuclear reactors at the Idaho National Laboratory. For over half a century the lab housed more than 50 unique nuclear reactors. Its nuclear expertise is devoted to scientific research related to materials and fuels testing and disposal. A significant number of non-nuclear programs are also researched by the INL including renewable energy sources, cyber security and environmental projects.

Eastern Idaho played an important role in the development of nuclear power. Despite the March 2011 earthquake and tsunami involving the Fukushima Daiichi nuclear power plant in Japan, there is continued interest in expanding the use of nuclear power in the United States. As the demand for this form of power grows, eastern Idaho may find itself at the hub of a growing and important industry.

At present about 15 percent of the world's electricity is produced by nuclear reactors. Over half is produced in France, Japan and the United States. Currently the United States produces less than 20 percent of nuclear-based electricity. France receives about 80 percent of its power from nuclear sources. The European Union obtains 30 percent of its electricity from this source.

According to a 2009 Massachusetts Institute of Technology assessment, The Future of Nuclear Power, nuclear energy industry growth is possible. The study found several factors likely to encourage future growth including:

- An overall excellent record of performance by more than 100 of America's nuclear power plants.
- Extended licenses for many nuclear reactors.
- Greater public acceptance of nuclear power.
- Current plans to build new nuclear power plants.
- A growing need for global energy solutions.
- A strong public demand for more cost effective sources of energy.

Research directed towards harnessing nuclear energy began in earnest with the discovery of nuclear fission in the late 1930s. The first man-made reactor, Chicago Pile-1 at the University of Chicago, achieved its first successful nuclear chain reaction in 1942.

However, it was not until 1951 when Idaho's ERB-1 reactor produced the first nuclear generated electricity. The ERB-1 reactor generated 100 kilowatts of electricity.

The first commercial nuclear reactor, the Obninsk Nuclear Power Plant, came online in the Soviet Union in 1954. The power plant provided about six megawatts of power. The Soviet plant remained open until 2002.

The first nuclear power plant in the free world began operating in 1956 in Calder Hill in Sellafield, England. The British plant had the capacity to produce 50 megawatts, which was later upgraded to 200 megawatts. The first American plant at Shippingport, Pa., began generating electricity in 1957. The Calder Hill plant still operates today. The plant at Shippingport was decommissioned in 1982.

During the 1950s hopes were high that nuclear would create an almost endless supply of electrical power. Some in the energy industry even predicted a time of almost free and unlimited electric power. But public optimism towards nuclear energy took a sharp drop during the 1970s after the Three-Mile Island crisis.

The Three-Mile Island accident in 1979 grabbed international headlines and led to many antinuclear protests. While the accident was serious, no one died as a direct result of the event. Researchers have concluded that radiation from the accident only caused one to two cancer deaths within a 10-mile radius of the plant. Many area residents received a radiation dose close to the levels one would receive after being subjected to a series of x-rays.

While Three-Mile Island's impact was limited, the consequences of the Chernobyl nuclear disaster in 1986 led to at least 59 deaths directly from radiation exposure and the permanent evacuation of several communities near the accident.

Assurances have been made that the incidents at Chernobyl and the Fukushima plant in Japan in 2011 were due to design flaws. But many Americans still harbor concerns regarding the safety of nuclear power. These concerns were one of the driving forces behind America's decision to minimize the construction of new nuclear power plants. Currently, only one reactor is under construction at Watts Bar, Tenn., and is expected to be finished in 2015. Work on the 104 reactors currently operating in the United States began before 1975.

If demand for nuclear energy grows in the coming years, eastern Idaho is likely to see an economic benefit. The Idaho National Laboratory continues to perform nuclear energy research. With the future location of the AREVA's enrichment facility west of Idaho Falls, it is clear that the INL and the region are attractive to the nuclear industry.

INDUSTRY DEFINITION

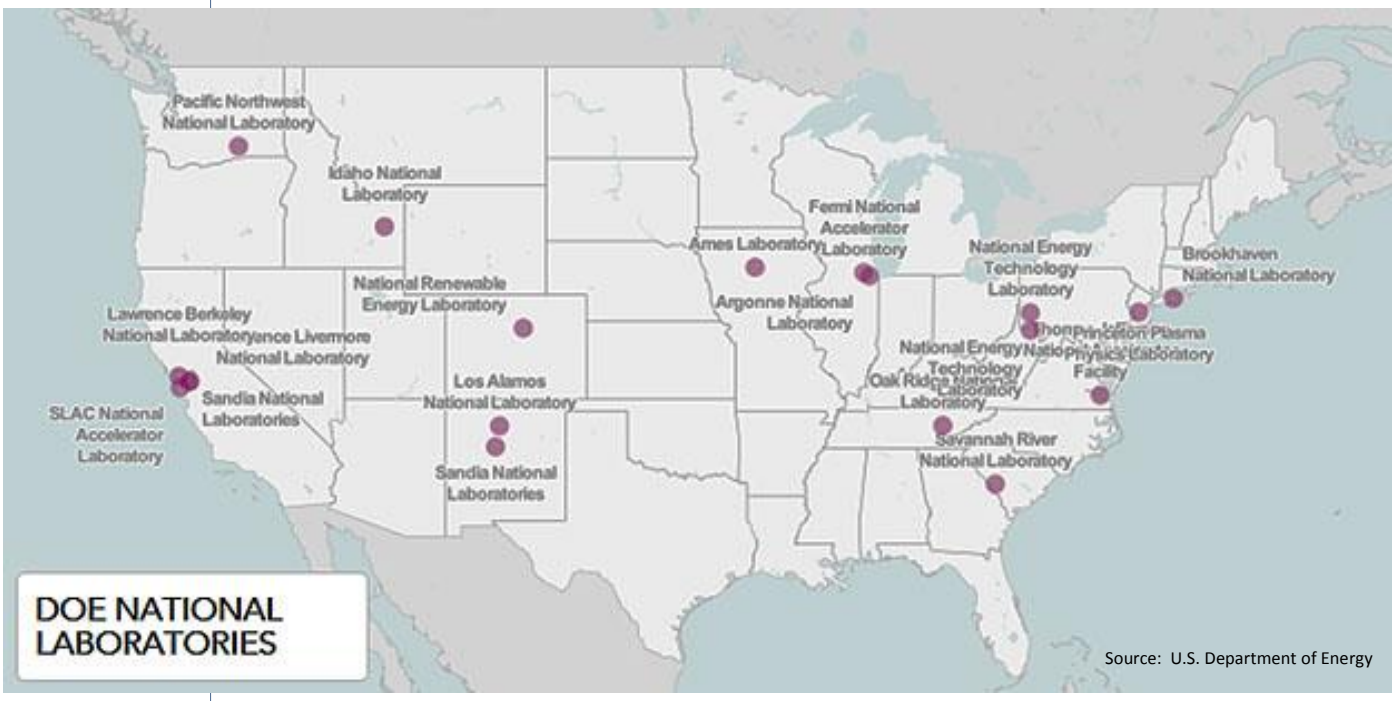
Idaho's nuclear cluster is difficult to define, and there is not a distinct classification taxonomy used by industry partners. An in-depth literature review did not yield a specific taxonomy. Further research revealed a significant number of government contractors

working in the nuclear industry classified under NAICS 541712 or research and development in physical, engineering and life sciences.

Other industries included under NAICS 541712 perform research and development related to agriculture, biology, botany, chemicals, engineering, environment, fisheries, food, forestry, geology, missile and space vehicle engines, health, life sciences, medicine, oceanography, photonics, physical sciences and physics. Research performed at the Idaho National Laboratory fits extremely well under the scientific research and development services classification. And in Idaho's case, the INL's presence generates a much higher concentration of scientific and technical service jobs compared to the concentration nationally.

LABORATORY IMPORTANCE

The U.S. Department of Energy identifies 24 national laboratories in 17 different states. Idaho has two national labs, the Idaho National Laboratory and the Radiological and Environmental Sciences Laboratory.



Established in 1949, the INL's economic benefit to eastern Idaho goes far beyond just adding high-paying jobs to the economy. The national laboratory produces valuable research with significant commercial potential. The lab's many technological and scientific fields include biology, nuclear energy, hybrid energy systems, bioenergy, robotics and nuclear nonproliferation.

Additionally, the lab's research efforts and facilities help small business gain a share of the knowledge it produces. The INL has helped launch over 40 technology related companies and issued over 500 licenses to companies for discoveries made at the laboratory.

The economic impact of the INL is immense. Laboratory operations have a statewide direct impact of over $1 billion annually. A 2010 economic impact study by Boise State University identified over $3.5 billion in additional statewide output linked to INL operations. In addition, every INL job created or sustained 2.22 jobs in other parts of the economy. The lab also contributed $1.83 billion in personal income in the state – or 3.5 percent of all personal income in Idaho.

The study also identified the lab's significant impact on eastern Idaho. At the time the lab directly employed 8,016 workers in eastern Idaho. It created or sustained an additional 12,695 – or 25 percent of eastern Idaho's employment.

NATIONAL TRENDS

In 2013 an estimated 440,000 workers across the nation were part of the scientific research and development industry – up from 349,000 in 2003. Idaho was responsible for 6,600 or 1.5 percent of the nation's 2013 total.

Federal budget reductions have cut deeply into Idaho's scientific research and development industry. Between 2003 and 2013, the industry's national employment increased 26 percent, but Idaho posted a 7 percent loss. During the same time, nationwide employment for all industries increased 4 percent.

It is not just jobs that are being cut. Real gross product took an even larger blow. Between 2011 and 2012 the U.S. Bureau of Economic Analysis reported a 0.4 percent increase in Idaho's real gross state product. During the same time, the Idaho Falls metropolitan area experienced a 3.1 percent decline. Idaho Falls' loss was predominantly due to losses in the professional and business services industry, which includes scientific research and development. This industry's production fell by $170 million or 12.9 percent. The same industry showed a 1.8 percent increase in production for all U.S. metropolitan areas.

Professional and Business Services - Real GDP (Millions)

Area	2008	2009	2010	2011	2012
United States Metro Areas	**$1,547,385**	**$1,456,818**	**$1,487,593**	**$1,559,275**	**$1,587,688**
% Change from previous	3.8%	-5.9%	2.1%	4.8%	1.8%
Idaho Falls, ID (MSA)	**$1,170**	**$1,234**	**$1,289**	**$1,313**	**$1,143**
% Change from previous	4.6%	5.5%	4.5%	1.9%	-12.9%

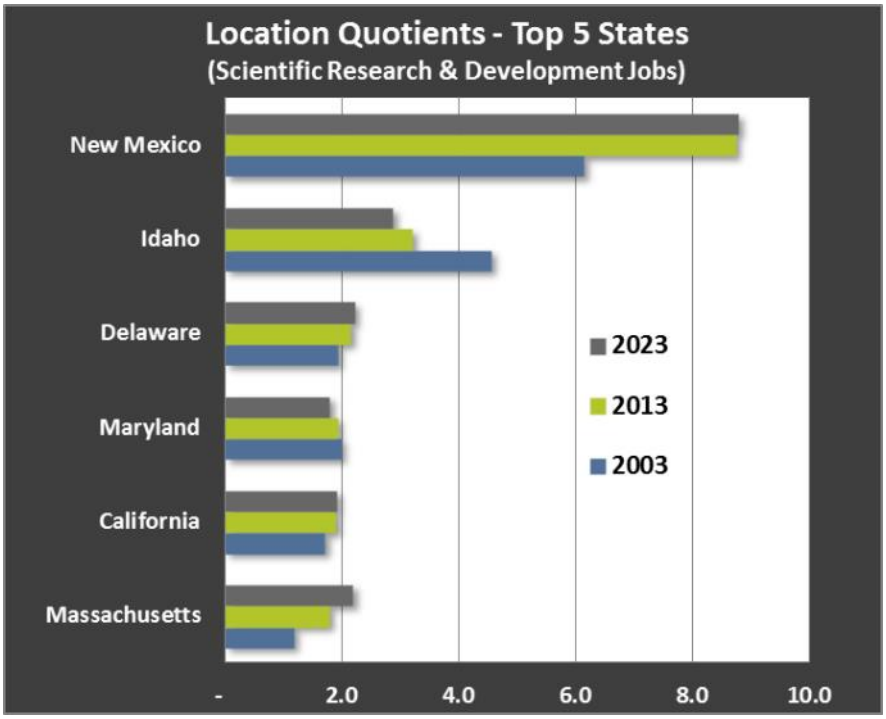
Source: U.S. Bureau of Economic Analysis

RELATIVE SIZE

Location quotients are a common tool for comparing industry employment density or relative industry size between states and regions. This statistical tool is calculated by dividing an industry employment within a region by total employment for the region. The resulting ratio is then divided by the same ratio as calculated for the area being compared. In this case, location quotients were calculated for all states and were compared to the national average.

In relative terms, Idaho's scientific research and development industry is one of the largest in the nation – only New Mexico was larger due to the presence of Sandia National Laboratory and Los Alamos National Laboratory, which both employ significant numbers of workers with a skill mix similar to Idaho National Laboratory. Idaho's 2013 location quotient was 3.2, indicating the employment concentration for scientific research and development jobs was 3.2 times greater than the nation's.

Job losses in the industry and job growth in other industries forced the employment concentration down from 4.6 times the nation's in 2003. The concentration is forecast to fall to 2.9 by 2023. But even with the decrease, Idaho is expected to remain second behind New Mexico in highest concentration of scientific research and development industry employment.



INDUSTRY WAGES – EARNINGS PER WORKER

Idaho's average earnings for all industries are notoriously low – only Mississippi is lower. Idaho's average wage for 2013 was $44,853, or 75 percent of the national average of $60,010. New York reported the highest average wage at $74,714 followed by Connecticut at $74,509.

Scientific research and development industry earnings averaged significantly higher than the national average for all industries at $125,075 in 2013 – more than double the average for all industries. That ratio also holds true in Idaho. In 2012, annual earnings per worker in scientific research and development averaged $99,188 – over 120 percent higher than the average for all Idaho industries. Idaho's scientific research and development wages ranked 27th highest when compared to other states. New Mexico was 19th at $106,596.

2013 Industry Average Annual Earnings

Scientific Research and Development			All Industries		
Area	Earnings	Ranking	Area	Earnings	Ranking
United States	$125,075	-	United States	$60,010	-
New Jersey	$172,731	1	New York	$74,714	1
Delaware	$165,686	2	Connecticut	$74,509	2
California	$161,926	3	Massachusetts	$72,426	3
Illinois	$155,222	4	New Jersey	$70,097	4
Georgia	$141,364	5	California	$67,771	5
Idaho	$99,188	27	Idaho	$44,853	49

Source: EMSI

IDAHO REGIONAL COMPARISON

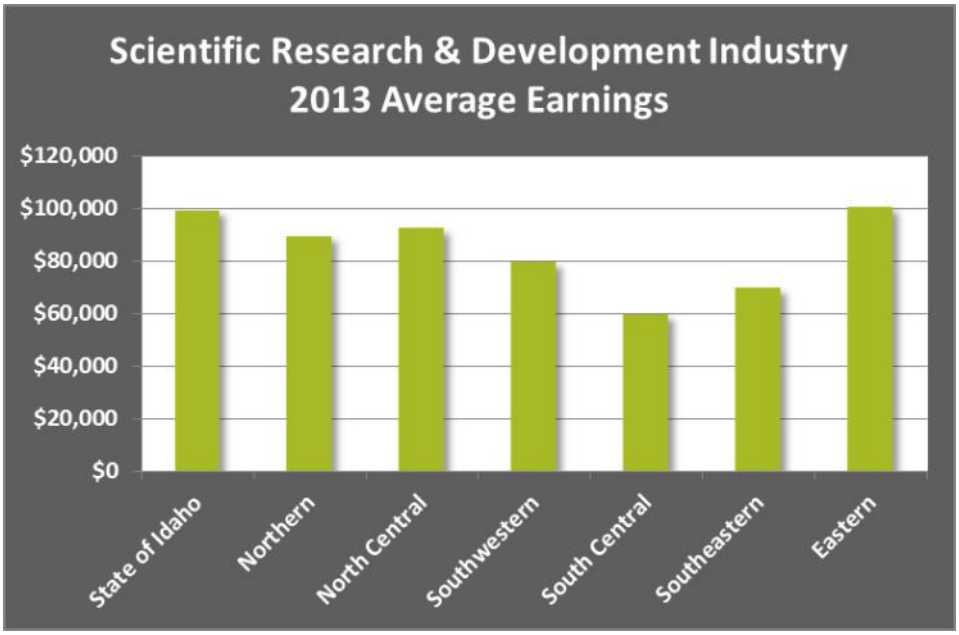
Eastern Idaho plays a dominant role in Idaho's scientific research and development industry. The region accounts for 94 percent of statewide industry employment – 6,227 jobs. Official reports from the U.S. Department of Energy for August 2013 indicate the Idaho National Laboratory employed nearly 3,500 workers. An additional 1,700 workers are employed by nuclear waste cleanup contractors. Another 1,200 were employed at the Naval Reactors Facility. Another 200 worked directly for the Department of Energy. The number of employees working for subcontractors was not available.

The southwestern region of the state holds the next highest number of jobs – just 4 percent of the state total. There were 37 establishments in southwestern Idaho, accounting for nearly 50 percent of the statewide total, which more than doubled the 17 in eastern Idaho.

Average earnings are significantly different between regions. The lowest average earnings per worker were found in south central Idaho at $59,513. Again, eastern Idaho topped the chart at $100,524.

Industry Change Summary						
Region	2003 Jobs	2013 Jobs	# Change	% Change	2013 Average Earnings	2013 Establishments
State of Idaho	7,103	6,600	-503	-7%	$99,189	76
Northern	45	13	-32	-71%	$89,411	8
North Central	30	38	8	27%	$92,390	4
Southwestern	208	236	28	13%	$79,512	37
South Central	86	74	-12	-14%	$59,513	6
Southeastern	32	11	-21	-66%	$69,629	5
Eastern	6,701	6,227	-474	-7%	$100,524	17

Source: EMSI



Idaho Regional Comparison - Scientific Research and Development											
	Industry Breakdown						Location Quotients		Shift Share Breakdown		
	2003 Jobs	2013 Jobs	# Change	% Change	2013 Average Earnings	Establishments	2003 National LQ	2013 National LQ	Job Change	Expected Change	Competitive Effect
State of Idaho	7,103	6,600	-503	-7%	$99,189	76	4.56	3.21	-503	1,854	-2,357
Northern	45	13	-32	-71%	$89,411	8	0.24	0.05	-32	12	-44
North Central	30	38	8	27%	$92,390	4	0.25	0.28	9	8	1
Southwestern	208	236	28	13%	$79,512	37	0.3	0.25	27	54	-27
South Central	86	74	-12	-14%	$59,513	6	0.43	0.28	-12	23	-35
Southeastern	32	11	-21	-66%	$69,629	5	0.21	0.06	-21	8	-29
Eastern	6,701	6,227	-474	-7%	$100,524	17	33.69	23.42	-474	1,749	-2,224

Source: QCEW Employees, EMSI 2013.2 Class of Worker

Occupation Analysis

The Idaho National Laboratory is one of the most important employers in the 16 counties of eastern Idaho. Despite recent and highly publicized layoffs, about 6,400 people work for the national research laboratory and its contractors.

In the coming years the INL will experience an increasingly aging workforce. Large numbers of employees are in their 50s and 60s, representing both a challenge for the INL and an opportunity for many Idahoans seeking high-wage technology jobs.

The INL is the nation's lead facility for nuclear research, addressing America's growing need for energy from nuclear and other sources.

While many businesses have benefited – and will continue to benefit – eastern Idaho's workforce has the opportunity to take advantage of the job openings created by retirements of the INL's aging workforce. Nuclear engineers and nuclear technicians will especially be in the spotlight.

OCCUPATION HIGHLIGHTS

Occupations within the scientific research and development industry offer rewarding career opportunities. The industry staffing pattern typically includes highly skilled workers with extensive academic and research backgrounds. A Boise State University study indicated nearly 80 percent of INL employees had postsecondary certificates or college degrees, and over 20 percent had graduate degrees.

Job openings often depend on federal funding availability. Recent INL workforce restructuring put several hundred workers out of work. The impact of layoffs on workers varied. Individuals in business operations or administrative positions have a difficult time finding local jobs that pay close to their previous earnings. The average INL employee earns over $80,000 annually. But some portion of the workforce is accustomed to moving where the work or funding is. This is especially true for those who work with hazardous waste cleanup.

The long-term demand for scientific research and development workers is difficult to predict. The future of nuclear power generation is less certain in the wake of the Fukushima Daiichi nuclear disaster. The INL scope of work is somewhat insulated from public opposition to nuclear power. The nuclear research capabilities of the INL will remain vital to the future of nuclear waste disposal and safety.

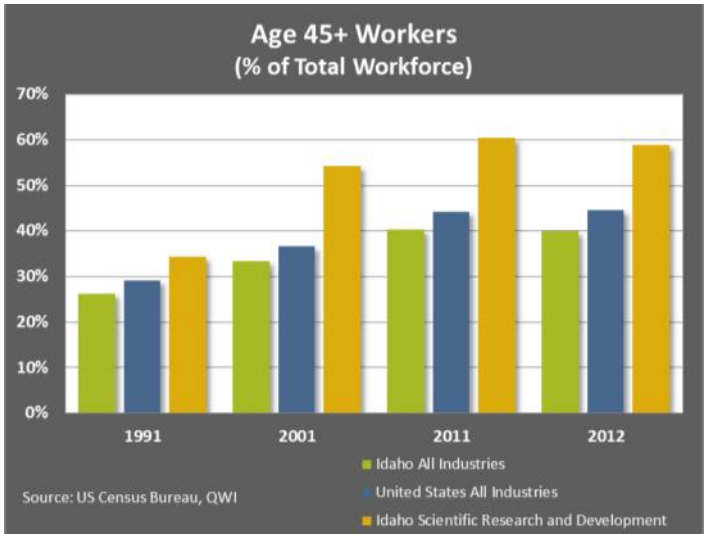
WORKFORCE REPLACEMENT NEEDS

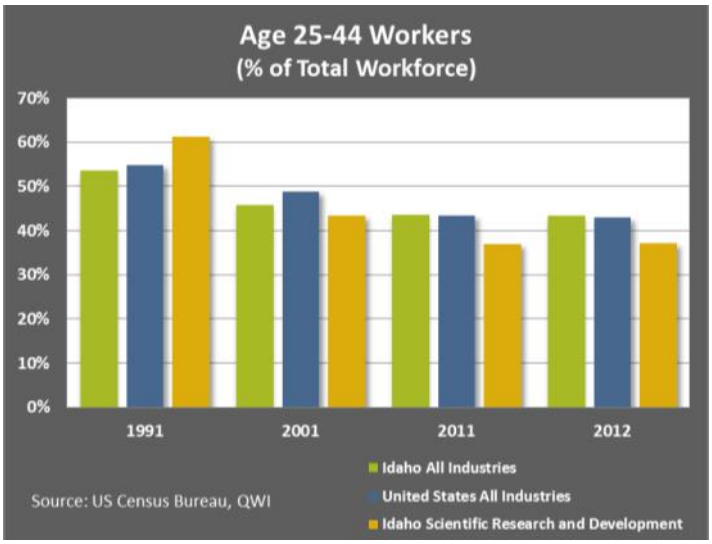
Preliminary data released by the Center for Disease Control show 2012 had the lowest birthrates in U.S. history. The baby boom is certainly over and has been for some time. As the baby boom generation retires most industries will feel the strain of finding a sufficient supply of replacement workers. The scientific research and development industry is far from immune to this nationwide problem.

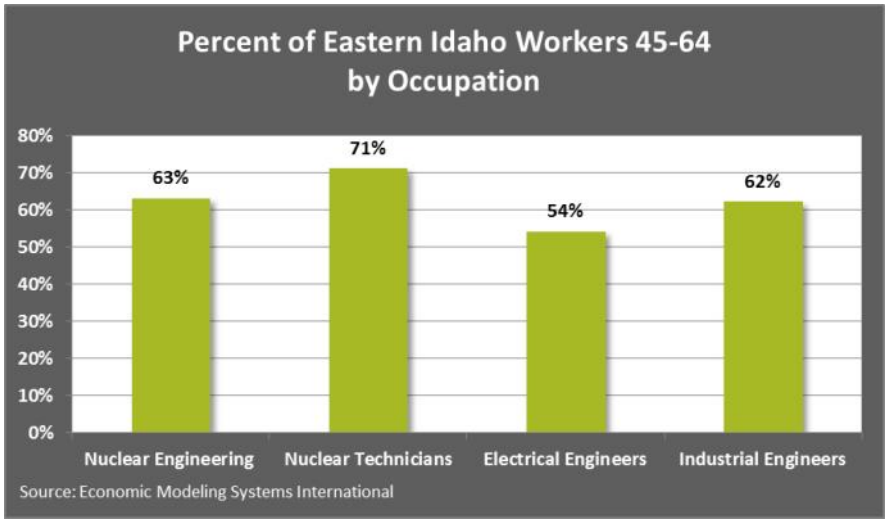
The U.S. Census Bureau collects workforce demographic information through the Quarterly Workforce Indicator program. Idaho is one of many states participating in the program, which sheds light on the aging workforce situation.

According to 1991 data, 26 percent of Idaho's workforce was age 45 or older – slightly lower than the national average of 29 percent. In 1991, Idaho's scientific research and development industry's 45 and older workers made up over 34 percent of total workers. By 2011 the shift toward an older workforce was very apparent in all industries but especially in scientific research and development. In those 20 years the share of 45 and older workers increased from 34 percent to over 60 percent. At the same time, the 25 to 44 age group was shrinking. In 1991 over 61 percent of the industry was made up of 25- to 44-year-old workers. By 2001 the share decreased to 43 percent and fell to 37 percent in 2011 and 2012.

Without an adequate number of replacement workers, there will not be enough younger workers to fill vacancies created by retirees. This will become more of an issue over the next five to 10 years, depending on the industry's growth and need for workers.







According to data from Economic Modeling Specialists International, there are currently 87 nuclear engineers working in the INL's labor market area, and 55 of them are 45 to 64 years old. The entry level hourly wage in Idaho for a nuclear engineer is $37.49, and the median wage is $51.63.

The data also show an aging population of nuclear technicians. Of the 22 workers in that occupation in and around the INL, 16 are 45 to 64 years old.

Electrical engineers are also rapidly aging – 54 percent of them in eastern Idaho are 45 to 64 years old. Sixty-two percent of the industrial engineers are between 45 and 64.

All of these are comparatively high-wage occupations, and there are 200 electrical and industrial engineers in eastern Idaho.

With so many older engineers in the workforce, there is great opportunity for young people to obtain the necessary education to fill these jobs in the future. Most engineers in eastern Idaho hold a four-year college degree in their specific field, and the majority of nuclear technicians have a two-year technical degree in that area.

STATE-BY-STATE COMPARISON

Staffing patterns were used to identify occupations in the scientific research and development industry. Special analysis was done with relation to scientific research and development jobs in Idaho's nuclear industry cluster. Idaho ranked in the top five among the states for its concentration of nuclear engineers and nuclear technicians. A selection of rankings for scientific research and development occupations is available in the appendix. (**See Appendix 1.**)

STATEWIDE REGIONAL COMPARISON

Eastern Idaho has most of Idaho's scientific research and development occupations. According to EMSI, the top five occupations listed under the scientific research and development industry staffing pattern include operations managers, biological technicians, medical scientists, business operations specialists and chemists.

These five occupations account for 724 jobs across Idaho, and 90 percent are in eastern Idaho. All of the top five listed occupations have decreased employment between 2003 and 2013. The largest losses were reportedly felt by medical scientists – an occupation that is not likely a major part of INL's operations but would be involved in medical grade nuclear isotope manufacturing. Chemists and biological technician jobs followed – each dropping over 90 jobs.

See **Appendix 2** for more detailed information.

TRAINING PROGRAMS

Eastern Idaho is fortunate to have access to institutions of higher learning which offer affordable training to those wishing to enter careers related to the INL and the scientific research and development industry.

Idaho State University's 2013 annual full-time tuition rate of $6,344 is a great educational value. The university's College of Science and Engineering offers several degree programs for careers at the INL or in scientific research and development industry. Idaho State offers undergraduate and graduate degrees in nuclear engineering, a bachelor's degree in electrical engineering and graduate degrees in applied physics and measurement and control engineering.

The school's College of Technology offers two- and four-year vocational degree programs in engineering technology, electrical engineering technology and nuclear operations technology. The College of Technology successfully places over 90 percent of its graduates.

Other training opportunities in the nuclear industry exist outside of eastern Idaho. Boise State University and the University of Idaho both offer graduate and undergraduate degrees in engineering, computer science and the physical sciences, which would have application to the scientific research and development industry. Lewis and Clark State College also offers undergraduate degrees in the physical science and computer sciences, which could facilitate a career in the scientific research and development industry.

Private colleges in Idaho also offer opportunities. The College of Idaho offers a bachelor's degree in physics and mathematics. Brigham Young University-Idaho offers several undergraduate degrees related to the nuclear energy industry including engineering, computer science and physical sciences.

There are also institutions offering online or distance education such as Michigan State University, which offers a master's and doctorate program in physics, largely online.

A second out of state online school offering valuable learning opportunities is the University of North Dakota, which has several bachelor's degree programs in engineering.

The aging workforce at the INL and in engineering fields generally represents a challenge for the economy of eastern Idaho. However, this situation offers a valuable and unique opportunity for those seeking careers in engineering in the coming years.

Appendix 1 – Scientific Research & Development Occupations – State Comparisons

Scientific Research & Development Occupations - State Comparisons												
Occupation	Rank	Area	2013 Jobs - Per 10,000	2003 Jobs	2013 Jobs	2023 Jobs	% Chg 2003-2013	% Chg 2013-2023	2003-2013	2013-2023	Median Hourly Earnings	Avg. Hourly Earnings
Environmental Engineers, SOC 17-2081	1	Alaska	11	278	373	413	34%	11%	95	40	$46.90	$52.91
	2	Wyoming	9	180	262	311	46%	19%	82	49	$34.48	$36.21
	3	New Mexico	8	552	637	675	15%	6%	85	38	$40.66	$42.46
	4	Massachusetts	8	2,234	2,599	2,959	16%	14%	365	360	$36.86	$38.10
	5	Vermont	7	194	225	241	16%	7%	31	16	$35.01	$37.99
	6	Missouri	6	677	711	762	5%	7%	34	51	$33.40	$35.31
	7	Montana	6	224	282	307	26%	9%	58	25	$34.37	$33.54
	8	Colorado	6	1,128	1,455	1,834	29%	26%	327	379	$41.25	$42.90
	9	Rhode Island	6	255	280	311	10%	11%	25	31	$39.31	$39.39
	10	South Carolina	6	971	1,116	1,301	15%	17%	145	185	$34.02	$35.94
	15	Idaho	5	269	328	385	22%	17%	59	57	$34.77	$37.61
		United States	4	44,733	52,061	62,244	16%	20%	7,328	10,183	$38.01	$40.07
Nuclear Engineers, SOC 17-2161	1	Virginia	5	1,537	1,853	2,024	21%	9%	316	171	$42.41	$42.32
	2	Tennessee	4	925	1,143	1,154	24%	1%	218	11	$54.90	$59.10
	3	New Mexico	4	196	324	354	65%	9%	128	30	$49.25	$48.32
	4	Idaho	4	186	244	262	31%	7%	58	18	$50.69	$56.71
	5	Connecticut	4	692	589	506	-15%	-14%	-103	-83	$52.01	$52.65
	6	South Carolina	3	525	579	599	10%	3%	54	20	$42.55	$43.73
	7	Washington	3	781	901	1,018	15%	13%	120	117	$44.71	$43.89
	8	Pennsylvania	3	1,689	1,662	1,659	-2%	0%	-27	-3	$48.52	$49.08
	9	Missouri	3	298	311	317	4%	2%	13	6	$55.21	$55.68
	10	Vermont	2	60	67	66	12%	-1.5%	7	-1	$40.57	$41.86
		United States	2	18,971	21,020	23,079	11%	10%	2,049	2059	$49.01	$50.56
Miscellaneous Engineers, SOC 17-2190	1	New Mexico	31	2,070	2,465	2,605	19%	6%	395	140	$53.41	$52.86
	2	New Hampshire	24	1,428	1,480	1,518	4%	3%	52	38	$37.62	$38.57
	3	Alaska	20	573	673	707	17%	5%	100	34	$54.29	$55.83
	4	Michigan	20	8,642	7,906	8,007	-9%	1%	-736	101	$38.75	$39.26
	5	Alabama	20	2,946	3,641	3,803	24%	4%	695	162	$51.98	$51.35
	6	Maryland	18	3,969	4,604	5,083	16%	10%	635	479	$55.64	$51.03
	7	Illinois	15	8,145	8,737	8,831	7%	1%	592	94	$39.44	$40.14
	8	Virginia	14	4,529	5,199	5,851	15%	13%	670	652	$51.13	$49.38
	9	Washington	13	3,479	3,958	4,319	14%	9%	479	361	$43.35	$43.22
	10	Louisiana	13	2,232	2,387	2,693	7%	13%	155	306	$36.68	$39.93
	18	Idaho	11	724	708	756	-2%	7%	-16	48	$37.45	$37.92
		United States	10	126,399	131,742	142,374	4%	8%	5343	10,632	$43.55	$44.36
Chemists, SOC 19-2031	1	Delaware	52	2,108	2,127	1,991	1%	-6%	19	-136	$39.97	$42.97
	2	Missouri	19	1,991	2,117	2,215	6%	5%	126	98	$27.77	$30.45
	3	New Jersey	13	6,437	5,104	4,691	-21%	-8%	-1,333	-413	$35.88	$37.81
	4	Maryland	13	2,993	3,257	3,385	9%	4%	264	128	$48.69	$50.45
	5	Massachusetts	11	3,571	3,708	3,960	4%	7%	137	252	$39.52	$40.35
	6	North Carolina	9	3,535	3,629	3,965	3%	9%	94	336	$29.97	$32.92
	7	Connecticut	9	1,768	1,414	1,416	-20%	0%	-354	2	$37.90	$37.30
	8	Indiana	8	2,608	2,380	2,276	-9%	-4%	-228	-104	$26.22	$29.29
	9	Utah	8	804	992	1,145	23%	15%	188	153	$32.66	$35.82
	10	Pennsylvania	8	4,623	4,279	4,400	-7%	3%	-344	121	$30.11	$32.30
		United States	6	83,585	83,595	88,867	0%	6%	10	5,272	$33.54	$35.95
	32	Idaho	4	339	267	290	-21%	9%	-72	23	$36.31	$36.54
Nuclear Technicians, SOC 19-4051	1	South Carolina	6	895	1,025	1,085	15%	6%	130	60	$28.87	$27.39
	2	New Mexico	4	50	319	372	538%	17%	269	53	$44.20	$43.80
	3	Idaho	2	68	101	114	49%	13%	33	13	$32.13	$35.85
	4	Tennessee	2	304	411	451	35%	10%	107	40	$36.98	$37.33
	5	Vermont	1.4	33	41	46	24%	12%	8	5	$28.52	$29.49
	6	North Dakota	1.3	31	54	64	74%	19%	23	10	$25.90	$24.49
	7	Missouri	1.0	93	112	133	20%	19%	19	21	$29.08	$28.83
	8	Colorado	1.0	185	225	265	22%	18%	40	40	$37.48	$36.22
	9	North Carolina	0.9	295	353	395	20%	12%	58	42	$32.62	$32.08
	10	Pennsylvania	0.9	462	490	579	6%	18%	28	89	$33.87	$33.34
		United States	0.7	7,289	8,737	10,190	20%	17%	1,448	1,453	$32.71	$32.46
Nuclear Power Reactor Operators, SOC 51-8011	1	Mississippi	1.3	118	138	148	17%	7%	20	10	$29.39	$29.62
	2	New Jersey	1.2	417	457	518	10%	13%	40	61	$38.76	$37.66
	3	Missouri	1.1	98	125	146	28%	17%	27	21	$36.16	$36.47
	4	Hawaii	1.1	43	69	74	60%	7%	26	5	$37.00	$37.67
	5	Maryland	1.0	190	262	314	38%	20%	72	52	$37.30	$37.18
	6	New Mexico	1.0	62	81	103	31%	27%	19	22	$35.92	$39.19
	7	North Dakota	1.0	32	41	45	28%	10%	9	4	$38.68	$38.28
	8	West Virginia	0.9	70	67	54	-4%	-19%	-3	-13	$30.87	$31.65
	9	Alabama	0.9	133	166	200	25%	20%	33	34	$34.64	$36.15
	10	Wyoming	0.9	21	25	27	19%	8%	4	2	$39.57	$38.02
	18	Idaho	0.7	23	44	55	91%	25%	21	11	$36.12	$36.05
		United States	0.5	5,920	6,731	7,795	14%	16%	811	1,064	$36.82	$37.28

Source: EMSI 2013.2

Appendix 2 – Idaho Regional Occupation Comparison

Idaho Regional Occupation Comparison								
Occupation Code	Description	State of Idaho	Northern	North Central	Southwestern	South Central	Southeastern	Eastern
Top Occupations - 2003 Jobs								
19-4021	Biological Technicians	271	<10	<10	11	10	<10	240
19-1042	Medical Scientists, Except Epidemiologists	265	<10	<10	<10	<10	<10	256
11-1021	General and Operations Managers	203	<10	<10	<10	<10	<10	190
19-2031	Chemists	170	<10	<10	<10	<10	<10	161
13-1199	Business Operations Specialists, All Other	165	<10	<10	<10	<10	<10	158
	Total	**1,075**	**10**	**<10**	**33**	**17**	**<10**	**1,005**
Top Occupations - 2013 Jobs								
11-1021	General and Operations Managers	197	<10	<10	<10	<10	<10	186
19-4021	Biological Technicians	177	<10	<10	12	<10	<10	151
19-1042	Medical Scientists, Except Epidemiologists	145	<10	<10	<10	<10	<10	136
13-1199	Business Operations Specialists, All Other	132	<10	<10	<10	<10	0	127
19-2031	Chemists	74	0	<10	<10	<10	0	66
	Total	**724**	**<10**	**<10**	**33**	**14**	**<10**	**666**
Top Occupations - Change (2003-2013)								
11-1021	General and Operations Managers	-6	--	--	--	--	--	-4
13-1199	Business Operations Specialists, All Other	-33	--	--	--	--	--	-31
19-4021	Biological Technicians	-94	--	--	1	--	--	-89
19-2031	Chemists	-96	--	--	--	--	--	-95
19-1042	Medical Scientists, Except Epidemiologists	-120	--	--	--	--	--	-120
	Total	-351	-10	0	0	-3	0	-339
Top Occupations - % Change (2003-2013)								
11-1021	General and Operations Managers	-3%	--	--	--	--	--	-2%
13-1199	Business Operations Specialists, All Other	-20%	--	--	--	--	--	-20%
19-4021	Biological Technicians	-35%	--	--	0.09	--	--	-37%
19-1042	Medical Scientists, Except Epidemiologists	-45%	--	--	--	--	--	-47%
19-2031	Chemists	-56%	--	--	--	--	--	-59%
	Total	-33%	-100%	0%	0%	-18%	0%	-34%

Source: QCEW Employees, EMSI 2013.2 Class of Worker

Appendix 3 – Data Sources

IN-HOUSE DATA

The Idaho Department of Labor has in-house data available for analysis from the Quarterly Census of Employment and Wages, Occupational Employment Statistics and occupational and industry projections. The quarterly census data come from employers who pay unemployment insurance taxes and are referred to as covered employment data. They provide numbers of establishments, employment and earnings by industry. The Occupational Employment Statistics program develops the wage survey publication. It provides data on employment and wages by occupations and information to determine staffing patterns. Projections are developed statewide and by region for the short term – two years – and the long term – 10 years. These data allow the Department of Labor to conduct numerous industry and occupational analyses for Idaho and its regions. There are limitations, however. The quarterly census and the occupational statistics include only jobs covered by the unemployment insurance system, which are about 90 percent of total jobs. There is a lack of readily available information for state-to-state comparisons. There are strict confidentiality rules on the use of both quarterly census and occupational data. This means that even though the Idaho Department of Labor might have data, the information cannot be released if there is a chance that an individual or business could be identified.

PURCHASED DATA

Idaho Labor contracts with Economic Modeling Specialists International for industry and occupational estimates for all 50 states. To estimate industry data, EMSI "combines covered employment data from Quarterly Census of Employment and Wages produced by the Department of Labor with total employment data in the Regional Economic Information System published by the U.S. Bureau of Economic Analysis, augmented with County Business Patterns and Nonemployer Statistics published by the U.S. Census Bureau." EMSI bases occupation estimates "on EMSI's industry data and regional staffing patterns taken from the Occupational Employment Statistics program (U.S. Bureau of Labor Statistics). Wage information is partially derived from the American Community Survey" conducted by the U.S. Census Bureau.

EMSI data are not subject to the same confidentiality requirements as the department's in-house data.

TYPES OF DATA

OCCUPATION AND INDUSTRY

The scientific research and development industry in Idaho can be measured by occupation and industry. Occupational data include employment and wages for specific occupations. Sometimes multiple job titles are grouped in one occupation. Industry information also tracks employment and earnings along with establishments. For example, data on an establishment identified in the nuclear industry would include not just the actual scientific research and development workers but all the accountants, secretaries, maintenance personnel and others. Thus, a nuclear industry will have both nuclear and non-nuclear occupations.

WHY HAVE TWO MEASURES?

Occupation information gives what is often referred to as a "workforce-oriented" view. This information allows stakeholders such as institutions of higher education to identify occupational shortages or specific occupation needs and to develop career ladders or paths of advancement in specific careers.

Industry information can be useful to economic developers. It provides a wide-angle view of the makeup of an economy and is therefore useful in identifying industry clusters or businesses that may cluster with other similar or supportive industries. This kind of measure allows economic developers to target the identified industries that offer higher wages because wages can be higher at every occupational level for an entire industry. For businesses willing to relocate entirely rather than move only a few occupations, this wide-angle view can be very useful.

ESTABLISHMENTS, EMPLOYMENT, EARNINGS AND WAGES

An establishment is a single location for an employer. A single employer may have more than one establishment such as a retailer who may be under one company with several locations around the state. Establishments under one company may be assigned to different industry or North American Industry Classification System codes, depending on their specific function.

Employment is a count of people working and does not differentiate between full time, part time or people who work multiple jobs. Earnings, for this business scan, include either EMSI's earnings per worker calculation, which includes estimated benefits, or the quarterly census information on total wages paid by employers to employees. Wages for this business scan include EMSI's estimates on median hourly wage and the hourly wage estimates provided by Occupational Employment Statistics.

METHODOLOGY

For this report, data was compiled for the scientific research and development industry or sector 541712 under the North American Industry Classification System. A significant portion of Idaho's nuclear cluster is classified specifically under the 541712 NAICS. Since Idaho is not directly involved in production of nuclear power, no attempt to include other nuclear related NAICS-defined industries was made. Other industries throughout Idaho are part of the nuclear cluster supply chain. Without the ability to measure the portion of nuclear-related output these industries generate, attaching any estimate for nuclear-related employment becomes difficult. It is possible Idaho's nuclear cluster impact is understated due to a number of businesses that contribute to the nuclear cluster but are not classified as scientific research and development firms.

Appendix 4 – Resources

Scientific R&D Industry and Idaho's Nuclear Cluster

NAICS 541712 Definition

National Vital Statistics Report

INL Economic Impact Study 2010

DOE National Laboratory Locations

MIT Report: Future of Nuclear Power

U.S. Census Bureau: Quarterly Workforce Indicators