U.S. Census Bureau

Local Employment Dynamics (LED) Workshop

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Welcome everyone! My name is Armando Mendoza, Data Dissemination Specialist from the Customer Liaison and Marketing Services Office, Data Dissemination Branch of the US Census Bureau.

First, let me tell you what this workshop is about – it is not intended to cover every aspect of the program and its applications, rather is an overview of a very comprehensive and powerful program of the U.S. Census Bureau: the Longitudinal Employment-Household Dynamics. Some people refer to it as LEHD or LED.

I am sure that in this group, there are diverse data and geographic needs; so in a short session as this one, it would be impossible to cover every aspect of the program. Having said that, we can provide additional training sessions either in-person or via Webinar to address specific needs of your organization. At the end of this presentation, I provide my contact information if you are interested in setting up follow-up training.

So, we'll start with a description of the program to provide you with an understanding of the LED infrastructure, and how the data is combined to create detailed statistics on employment, earnings, and job flows in different geographies, industries and demographic groups. We'll then cover the four powerful applications and Data Analysis tools and look at specific data for San Diego.

The Longitudinal Employer-Household Dynamics (LEHD or LED) program is part of the Center for Economic Studies at the U.S. Census Bureau. The LEHD program combines federal, state and Census Bureau data on employers and employees under the Local Employment Dynamics (LED) Partnership filling critical data gaps and provide indicators needed by state and local authorities.

Under the LED Partnership, states agree to share Unemployment Insurance earnings data and the Quarterly Census of Employment and Wages (QCEW) data with the Census Bureau. The LEHD program combines these data, additional administrative data, and data from censuses and surveys and creates statistics on employment, earnings, and job flows at detailed levels of geography and industry and for different demographic groups. In addition, the LEHD program uses these data to create partially synthetic data on workers' residential patterns.

All 50 states, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands have joined the LED Partnership, although the LEHD program is not yet producing public-use statistics for Massachusetts, Puerto Rico, or the U.S. Virgin Islands.

Our mission is to provide new dynamic information on workers, employers, and jobs with state-of-the-art confidentiality protections and no additional data collection burden.

Local Employment Dynamics (LED)

- LED is a part of the Longitudinal Employer-Household Dynamics (LEHD)
- LED is integral part of the U.S. Department of Commerce
- LED is a Partnership with all 50 States, DC, Puerto Rico* and the Virgin Islands *
- The LED program provides unprecedented details on jobs, workers, and local economies

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LEHD is a part of the Center for Economic Studies at the U.S. Census Bureau. It produces new, cost effective, public information that combines Federal, and State, and Census Bureau data on employers and employees under the LED Program.

It is an integral part of the U.S. Department of Commerce Open Government Plan to provide public access to high-value government data. It provides unprecedented details about America's jobs, workers, and local economies.

Why Are LED Data Special?

- 100% Coverage of UI Covered Jobs
- Firm Characteristics crossed with Worker Characteristics
- Detailed Geography
- Accessible via powerful and easy-to-use tools
- Flexible outputs: PDF reports, Excel tables, high-quality images, and shape files

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First, let's talk about the source of the data. Local Employment Dynamics (LED) is a voluntary partnership between state labor market information agencies and the U.S. Census Bureau to develop new information about local labor market conditions at low cost, with no added respondent burden, and with the same confidentiality protections.

The employment data used in this application are derived from Unemployment Insurance Wage Records reported by employers and maintained by each state for the purpose of administering its unemployment insurance system. The states assign employer locations, while workers' residence locations are assigned by the U.S. Census Bureau using data from multiple federal agencies. Using Quarterly Census Employment and Wages (QCEW) and the Unemployment Insurance (UI) worker wage records as the base, the Census Bureau links other available administrative records, as well as census and survey results. Age, earnings, and industry profiles are compiled by the Census Bureau from a state's records and are supplemented with other Census Bureau source data.

These statistics provide information about trends in employment, hiring, job creation and destruction, and earnings, with unprecedented detail on geography, age, sex, and industry going as far back as 1990.
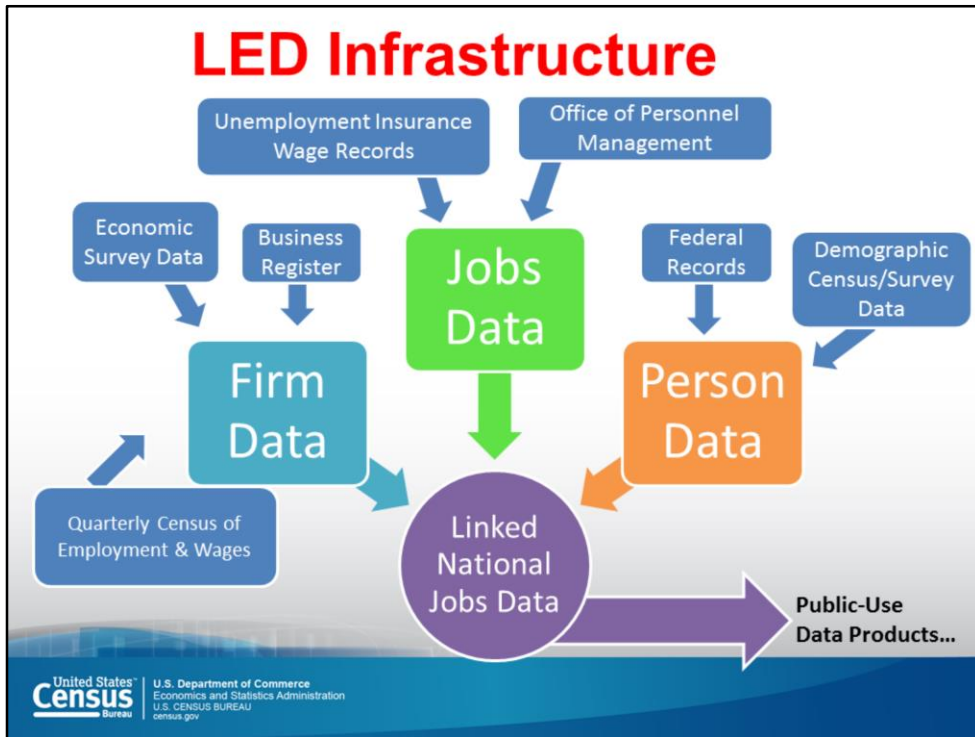
The slide summarizes the data sources by type and how they contribute to the data products available to the public.

The jobs data cover 95% of all private employment and most state, local, and federal jobs. This information is available from 1990 through 2015, though the start year varies by state and the end date is rolling.
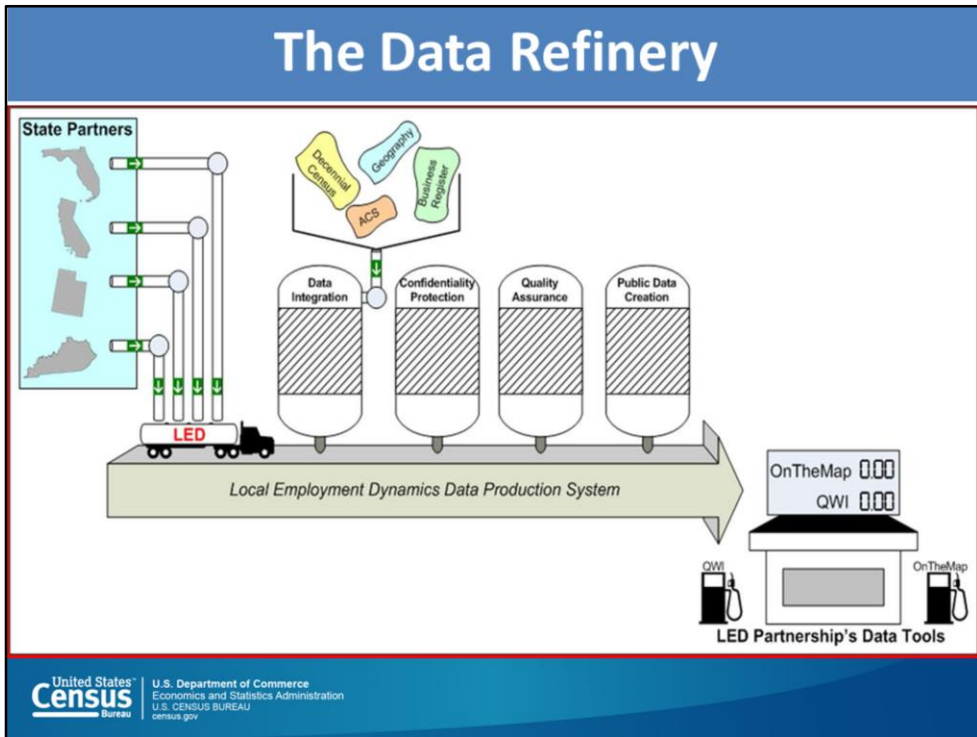
This graphic illustrates the same process in a simple way.

Now that you know what LED is, let's explore some of the tools available for accessing the data. The best browsers to use with these tools are Chrome or Firefox.

To begin, the Quarterly Workforce Indicators (or QWI) is a web-based analysis tool that enables comprehensive access to the full depth and breadth of the Quarterly Workforce Indicators (QWI) dataset. Through charts, maps and interactive tables, users can compare, rank and aggregate QWIs across time, geography, and/or firm and worker characteristics. The application's intuitive interface uses pivot tables and charts/maps to analyze labor-force indicators such as employment, job creation and destruction, hires, and wages across a wide range of geographies and firm and worker characteristics.
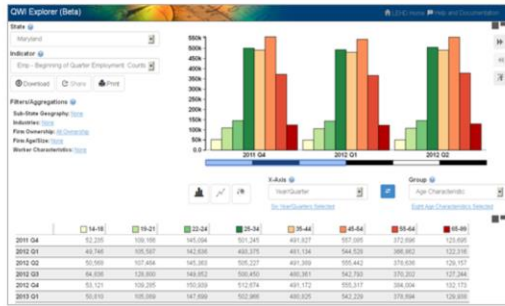
The Quarterly Workforce Indicators (QWI) is the flagship LED data product. It provides information about trends in employment, hiring, job creation and destruction, and earnings, with unprecedented detail on geography, age, sex, and industry going as far back as 1990.

Descriptions of the 32 indicators can be found in the LED Extraction tool. This reference is helpful because the indicator names are not necessarily intuitive within QWI Explorer. Here is the web address for the LED Extraction Tool: ledextract.ces.census.gov, which we'll discuss more later.

Choosing Among LED Data Products

Data Product	Why Choose It?	Potential Drawbacks
QWI	You need employment, hires, separations, turnover, or earnings by detailed industry or person characteristics, quarterly time resolution, or a relatively short data lag	No geography below county; no residential information
LODES	You need employment for detailed or customized geography, residential patterns of the workforce, or relationship between worker employment and home locations	Less detailed firm/person characteristics; significant data lag (temporary)
J2J	You need to understand transitions of workers among jobs	Data product still under development

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*But feedback is welcome.

In addition to QWI, there are two other products providing helpful information. The LEHD Origin-Destination Employment Statistics (LODES) provides annual employment statistics linking home and work locations at the Census block-level. And there is a new LED product, Job-to-Job Flows (J2J) (currently in Beta release), which provides an unprecedented look at worker flows between states, industries, and non-employment.

This table summarizes the value of each, as well as the limitations.

Quarterly Workforce Indicators (QWI)

Starting wages college educated men in high-tech industries in CA

- Detailed workforce dynamics, by worker characteristics and firm characteristics

- **Popular uses**:
  - Local workforce demographics
  - Local industry workforce trends
  - Workforce turnover, job creation and destruction

Legend:
- 3254 Pharmaceutical and Medicine Manufacturing
- 5417 Scientific Research and Development Services
- 5112 Software Publishers
- 3344 Semiconductor and Other Electronic Component Manufacturing
- 5415 Computer Systems Design and Related Services

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There are many ways to look at the data… information can be displayed by worker characteristics (e.g., sex, educational attainment), firm characteristics (e.g., industry), etc.

For example, this graph shows the starting wages for college educated men in high tech industries.

Let's go online now and work in the QWI tool. Here is the web address: qwiexplorer.ces.census.gov. Remember that Chrome or Firefox are the browsers recommended when using these tools.

As a first step, let's specific San Diego County as the geographic area of interest by clicking on None beside Geography and searching for San Diego or scrolling down.

Let's say we are interested specifically in the health care industry. The same process is used. Simply click on None beside Industries and search for Health Care or scroll through the choices.
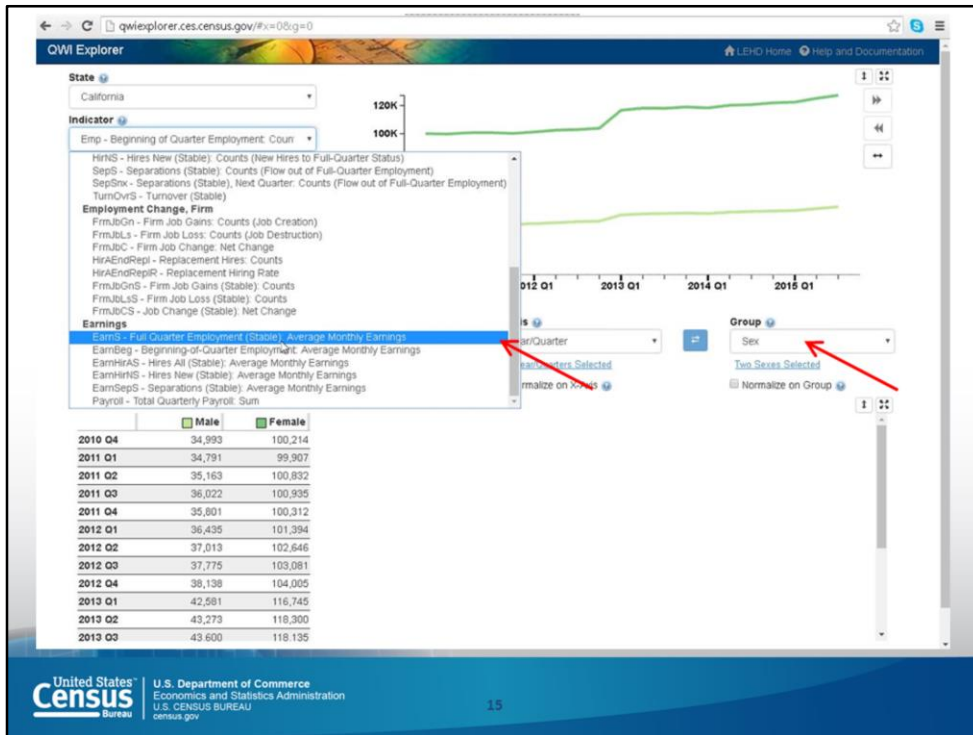
Let's look at the differences in earnings for men and women.

To specify earnings, click on the arrow in the box under Indicator and go down here to Earnings, and choose Full Quarter Employment (Stable). The word stable in parentheses means this group of people worked the full quarter, January 1st thru March 31st.

To analyze the data by sex, choose Sex in the box under Group.
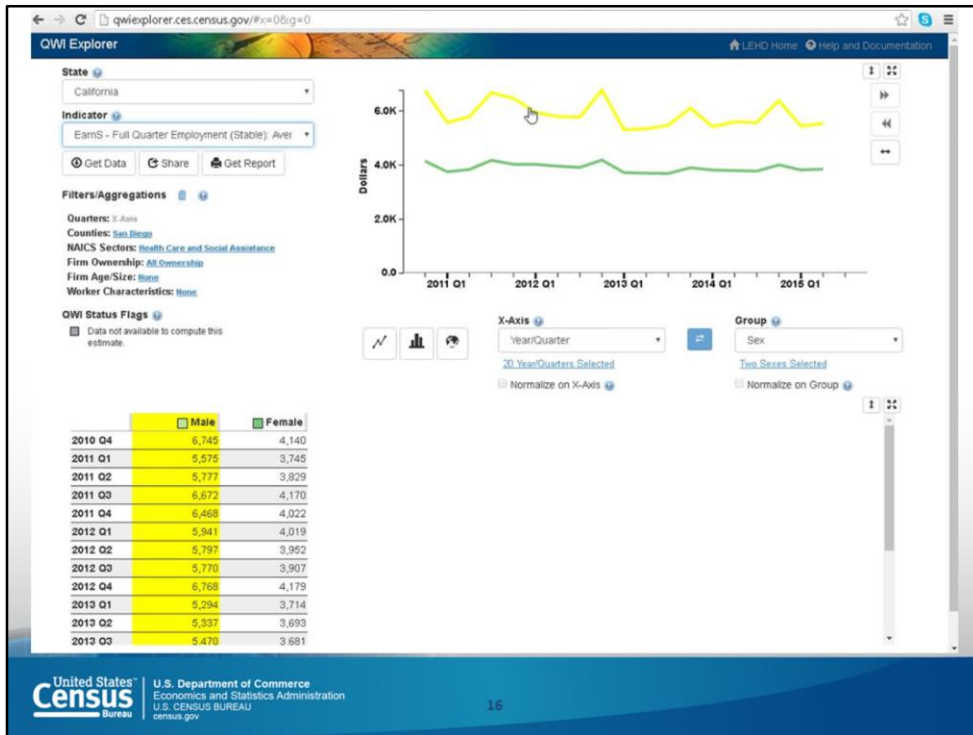
So here are the differences in earnings in San Diego in the healthcare industry between males and females. The little spikes in the male line show bonuses. It seems that females are not receiving bonuses.

To compare, we can look at another state and see if that's true there too. Let's see the same information for Arizona and Georgia. (NOTE: The screen shots are not included in this PowerPoint.) It's pretty consistent across states.
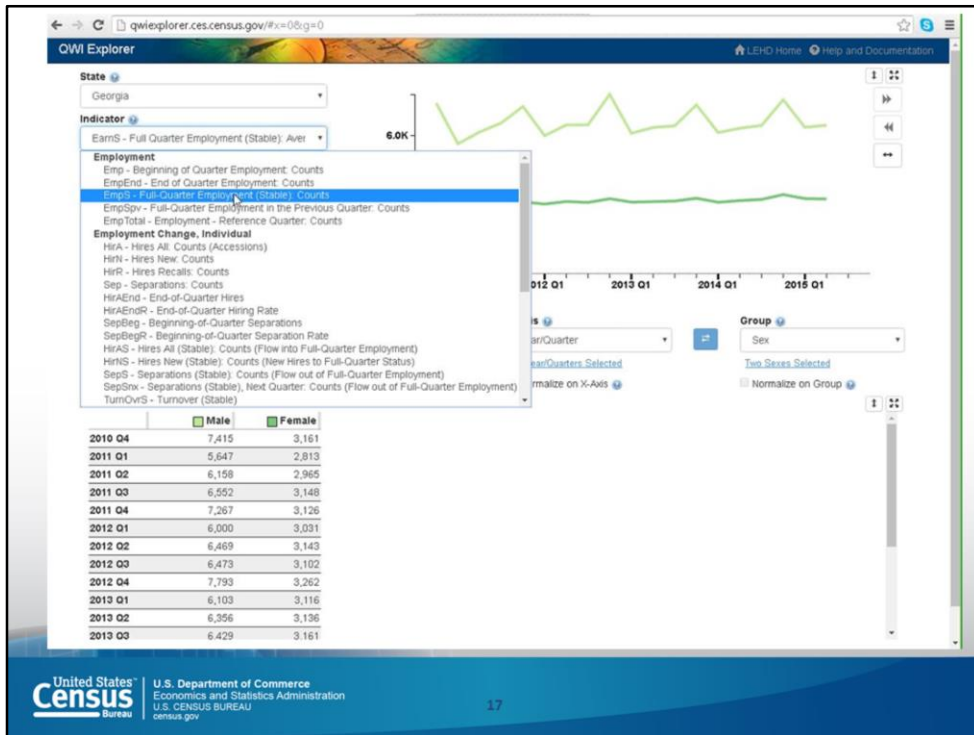
Maybe there are more males than females in the industry. We can look at that by changing the indicator to Employment and choosing Full-Quarter Employment (Stable) Counts. This indicator shows the actual numbers between males and females.
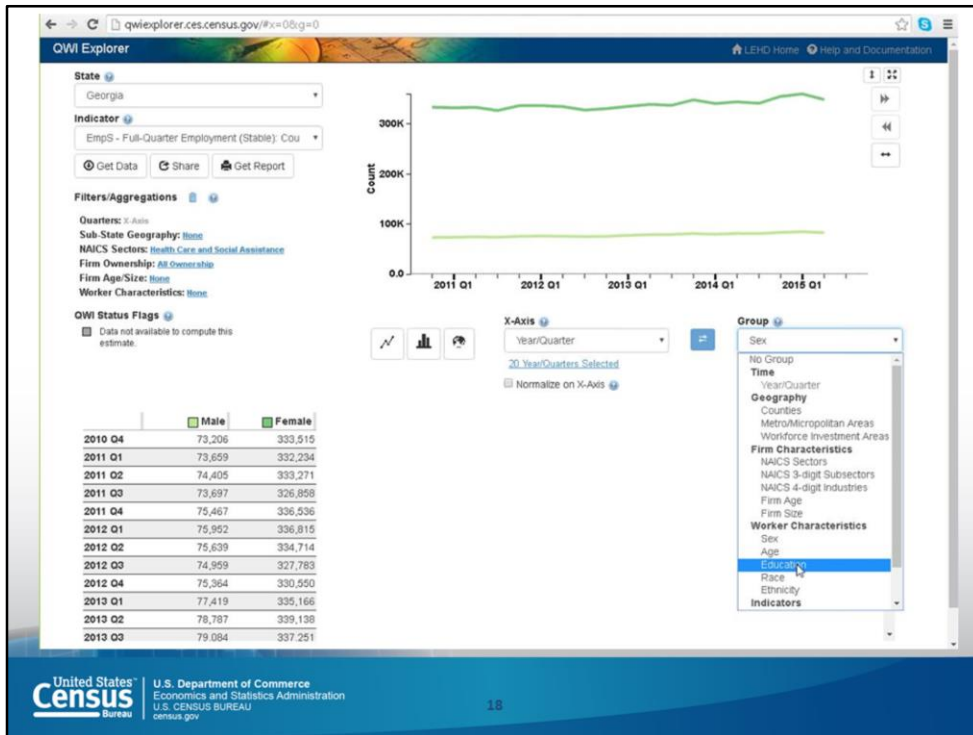
Hum. Interesting. There are a lot more females than males. So it has nothing to do with numbers.

How about education? Go back under Group and select Education.
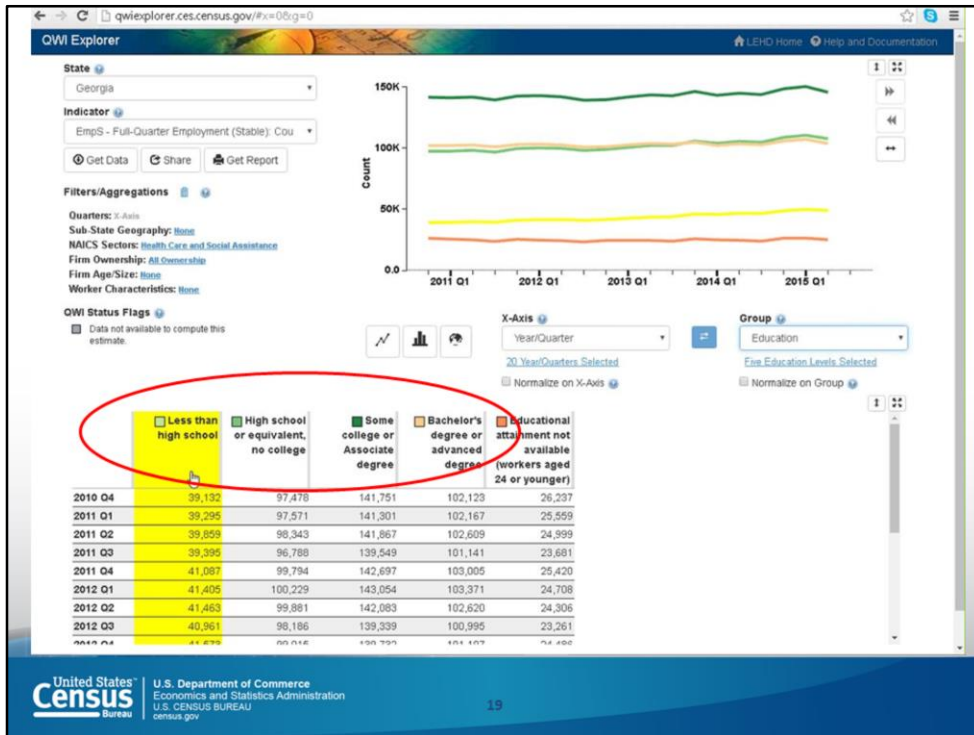
And here you see the categories: less than high school, high school or equivalent, some college or associate degree, and bachelor's degree.
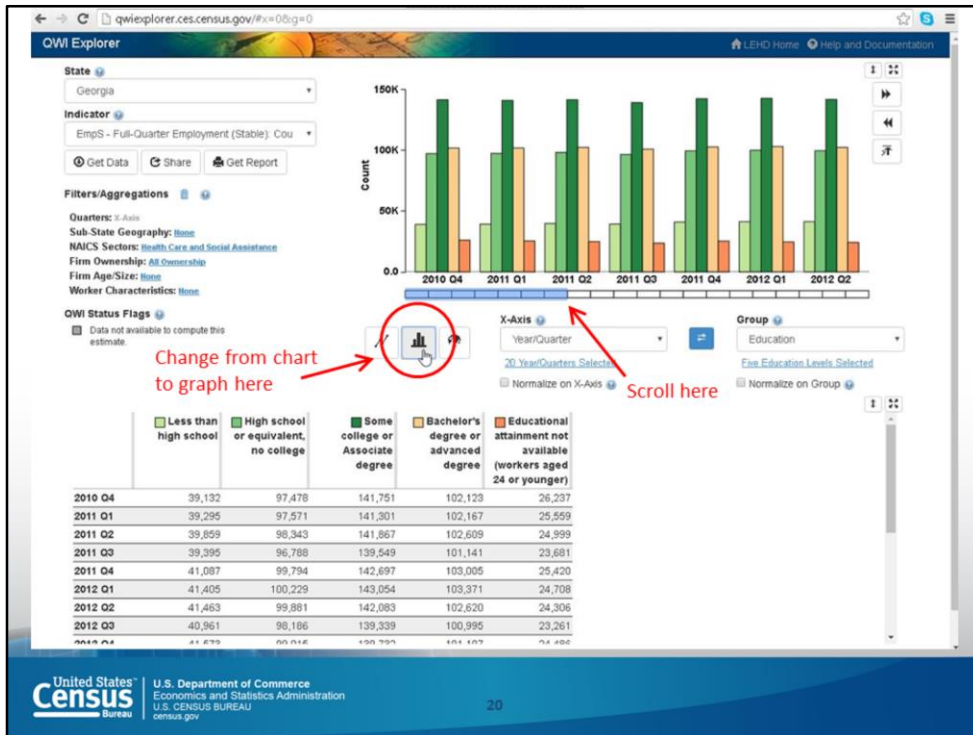
There's another way to display the data. By clicking on the bar chart symbol the new format immediately changes.

For this format, a scroll bar is shown so you can move through the quarters.

You can download everything as a PDF report using this icon.

Also, by clicking on Get Data you can download the data into an Excel file or a ZIP file or you save the chart or map as an SVG or PNG image.
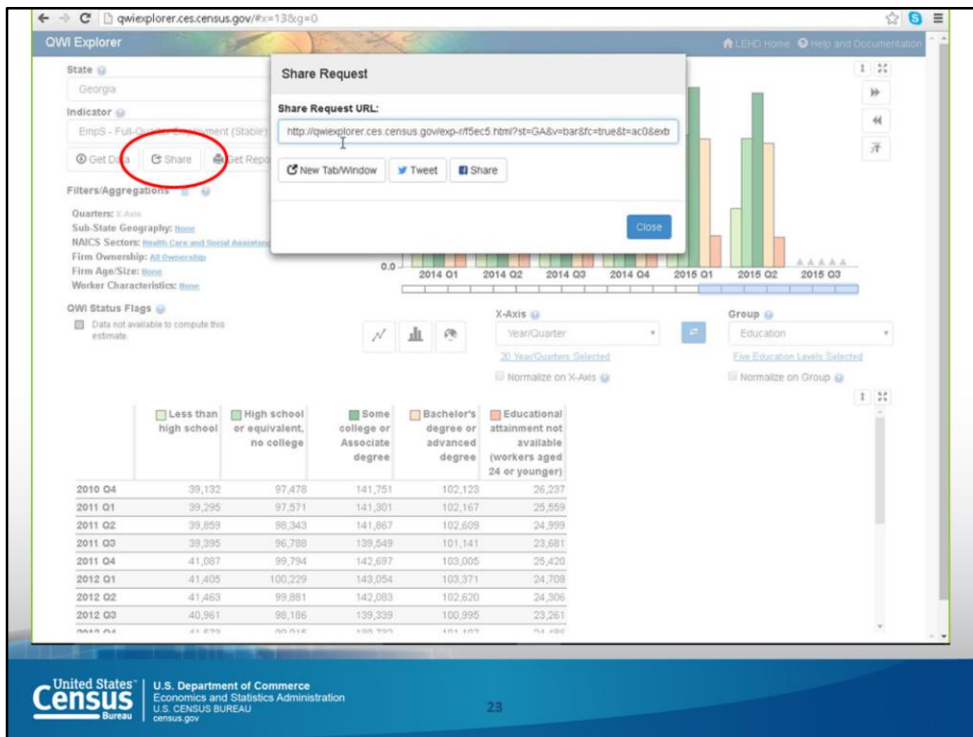
And you can share this information by clicking share to grab the URL to use in an email, tweet, or on Facebook. This URL will save you from doing all these steps again whenever you want to replicate the same analysis.
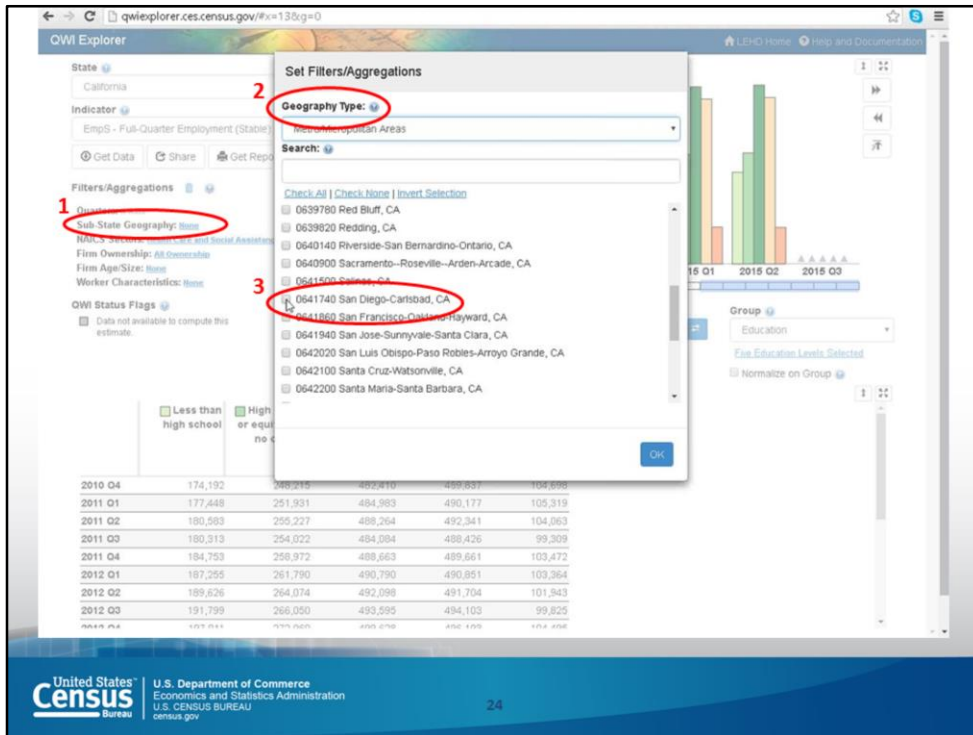
How about we look at educational attainment some more? People with higher educational attainment make more money, right? That's general knowledge. Does anyone want to look at a specific county or industry?

Answer: How about science and technology?

Okay, and at what graphic level?

Answer: Below San Diego level.

Unfortunately, for the San Diego region, the county boundaries are the smallest level of geography available in QQI Explorer. However, in a moment, I'll show you other tools where you can look at areas within the county.

Still, let's check out the metropolitan area by clicking on the current geographic areas specified and changing the Geography Type to Metro/Metropolitan Areas and choosing San Diego-Carlsbad. .

(NOTE: The geographic boundaries for this area are the same as for San Diego County, which is not always the case in other areas across the nation.)

To specify science and technical services as the industry, click on NAICS Sectors and choose 54 as specified on this slide.
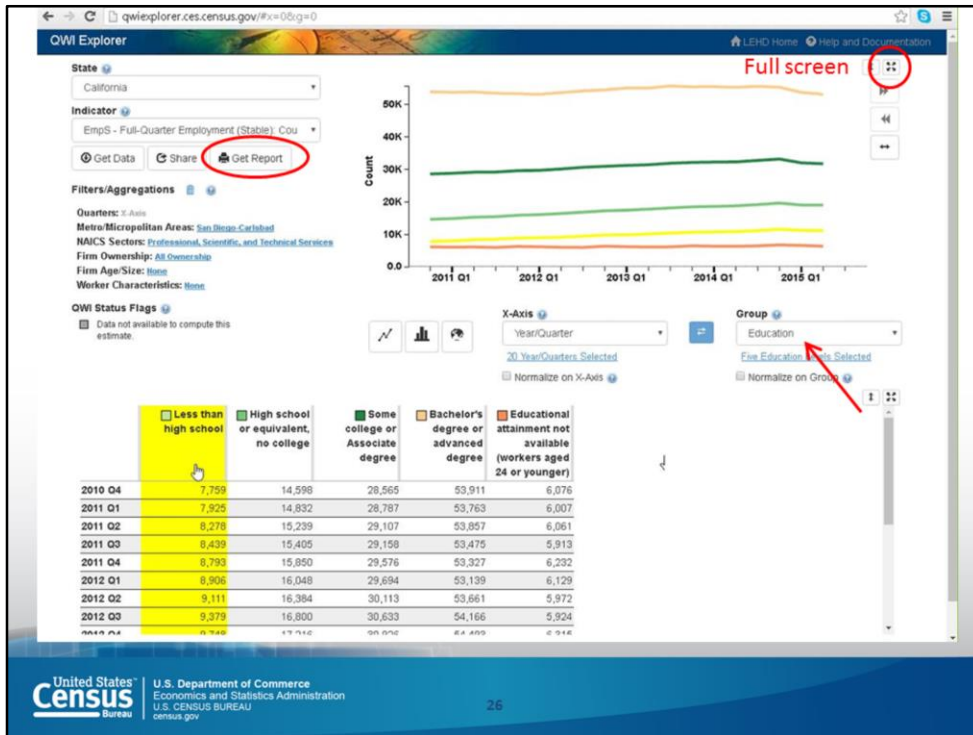
We already have Education selected over here and the distribution automatically displays. So now we can look at employment in this field of those with less than high school, high school degree, some college or an associate degree, and as you can see there's an advantage to bachelor's degree or advanced degree.

If you want to see a larger version of the chart, click in the top right corner to expand it to full screen. And if you click on "Get Report," you can download a PDF file with the chart and table, as well as a documentation of the data source.

Moving on to the next tool: On The Map.
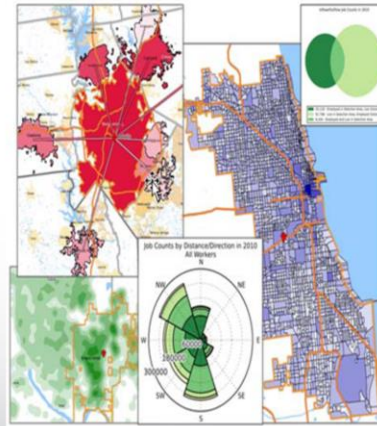
On The Map has several impressive features.

First, the coverage is comprehensive with Census block-level data for home and work areas in 49 partner states with consecutive years of data from 2002 to 2010 and including the following characteristics: worker age, earnings, industry sector, worker race, worker ethnicity, worker educational attainment, and worker sex.

The analysis tools are powerful. There are six different analysis types available for users to analyze, compare, and summarize a vast amount of labor force data for user-defined or Census-standard geographic areas. Each set of results are presented through interactive maps, charts, and reports.

The outputs are versatile. Results can be exported to a report (PDF, HTML, XLS), to a map (KML or Shapefile), or to other forms (PNG images or composite PDF). Users can also save their analysis settings for future use in OnTheMap.

Online documentation, including tutorials and walkthroughs, is available at http://lehd.ces.census.gov/led/datatools/onthemap.html.
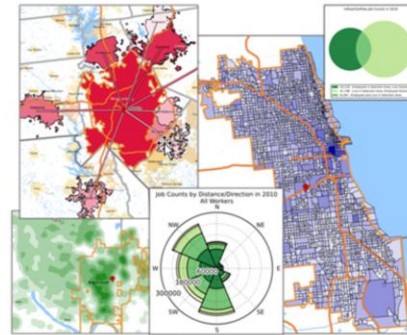
OnTheMap includes a visual mapping component to demonstrate some of the information referenced in the QWI explorer, as well as commuting patterns. It is the Census Bureau's most robust mapping tool, and provides an unmatched ability to locate worker data down to the block group and industry data down to a block level. One point to note is that you can examine where workers live or where residents work, not both together.

Let's go online now and work in the tool. Here is the web address: onthemap.ces.census.gov.

Remember that Chrome or Firefox are the browsers recommended when using these tools.

From the LEHD page, you can click on the OnTheMap link on the right. Or you can go directly to the tool at this address: onthemap.ces.census.gov

The initial page shows a map of the United States. To begin, search for a geography by typing San Diego in the search box.

The result shows all the options with San Diego in it, including other parts of the country (e.g., there's a San Diego city in Texas). You can scroll through all the choices.

You'll notice some acronyms (the Census Bureau uses a lot of them). The one circled on this slide stands for Census Designated Place, which means it's an unincorporated city.

For this example, let's select San Diego city, California.

To do some analysis, click on Perform Analysis on Selection Area.
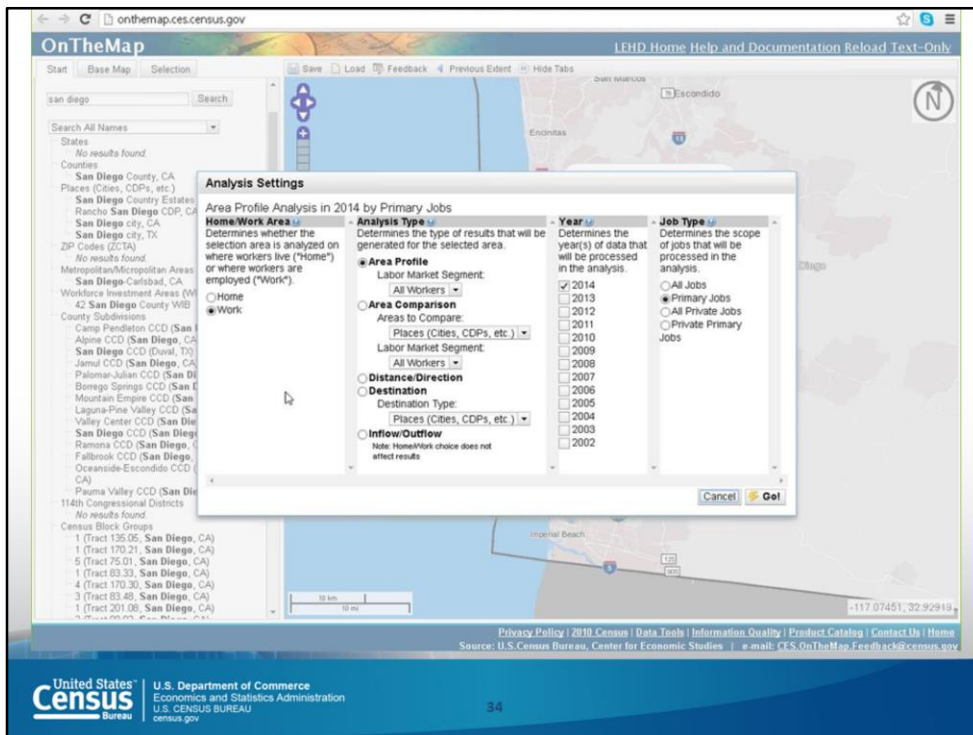
Now four panes pop up. You can look at Home or Work, conduct four different kinds of analysis, and choose the year of interest. The latest data available is 2014. The final area allows you to specify the type of jobs to be included.
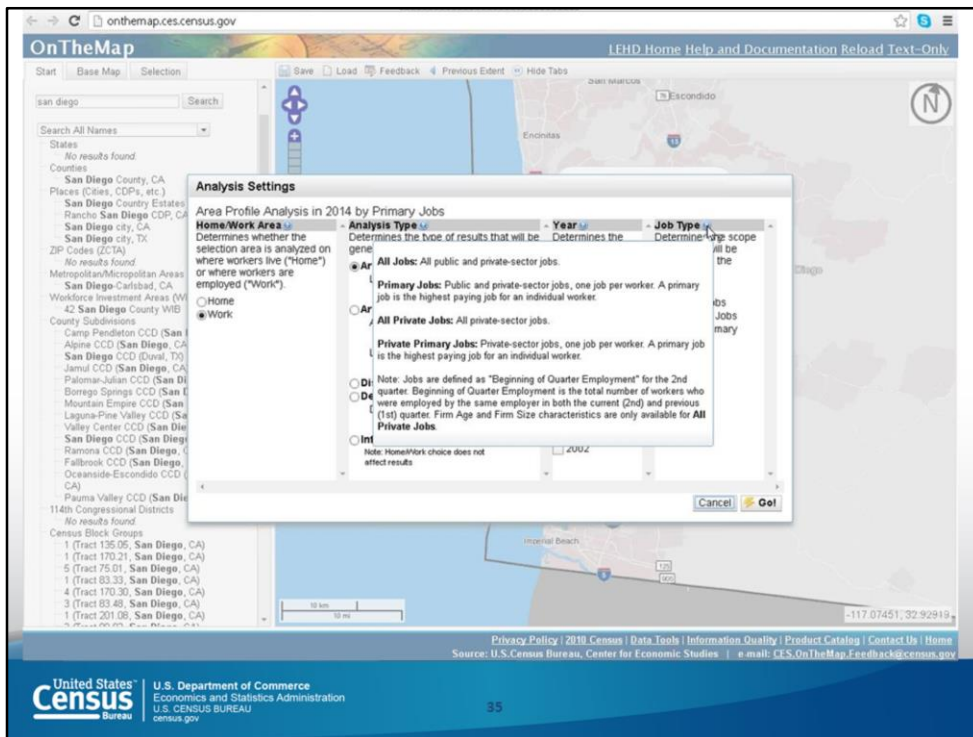
By hovering over the question mark with the mouse, descriptions are provided for each topic. For example, by hovering over the question mark by Job Type, we see that All Jobs are all public and private sector jobs, Primary Jobs are public and private sector jobs with one job per worker. Specifically, it is the highest paying job for an individual worker. So for those people who have multiple jobs, they use the one with the highest pay for this analysis.

When you are happy with your specifications, click Go.
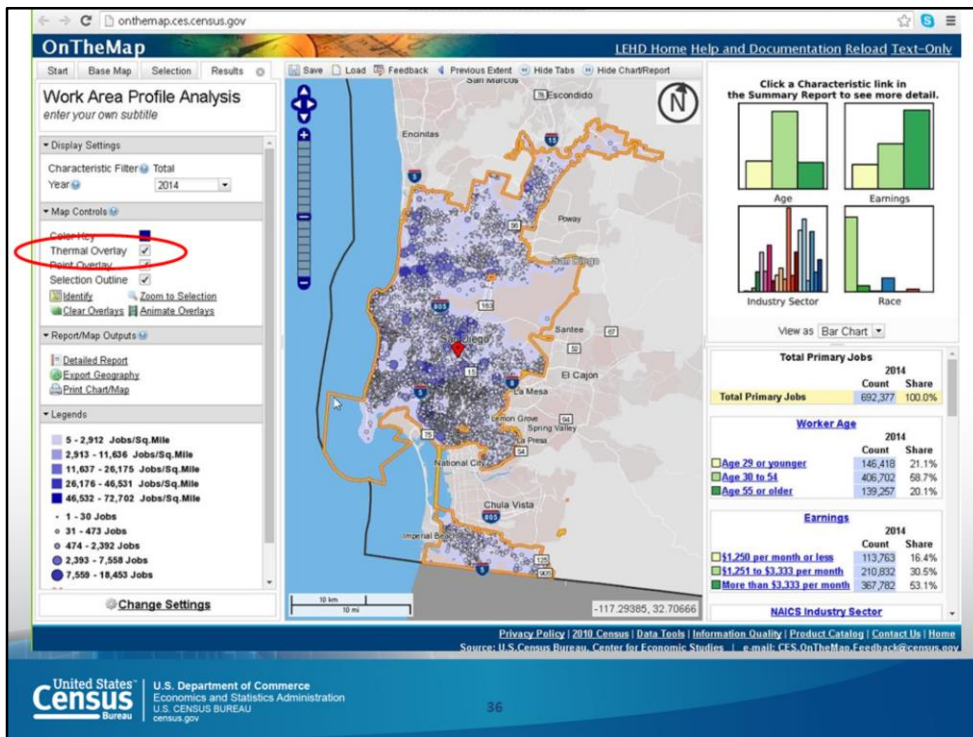
Once you have specified the data to show, you can modify the display by zooming in, turning on and off the map controls (for example, deselecting the Thermal Overlay).

This slide shows the concentration of jobs. There are caveats to keep in mind. These locations are where payroll is processed, even if the individuals work at a different place.

A detailed report is available showing more information than displayed on the map.
By the option circled in red, this report comes up.

To modify the analysis, click on "Change Settings." For example, you might want to look at Inflow and Outflow.
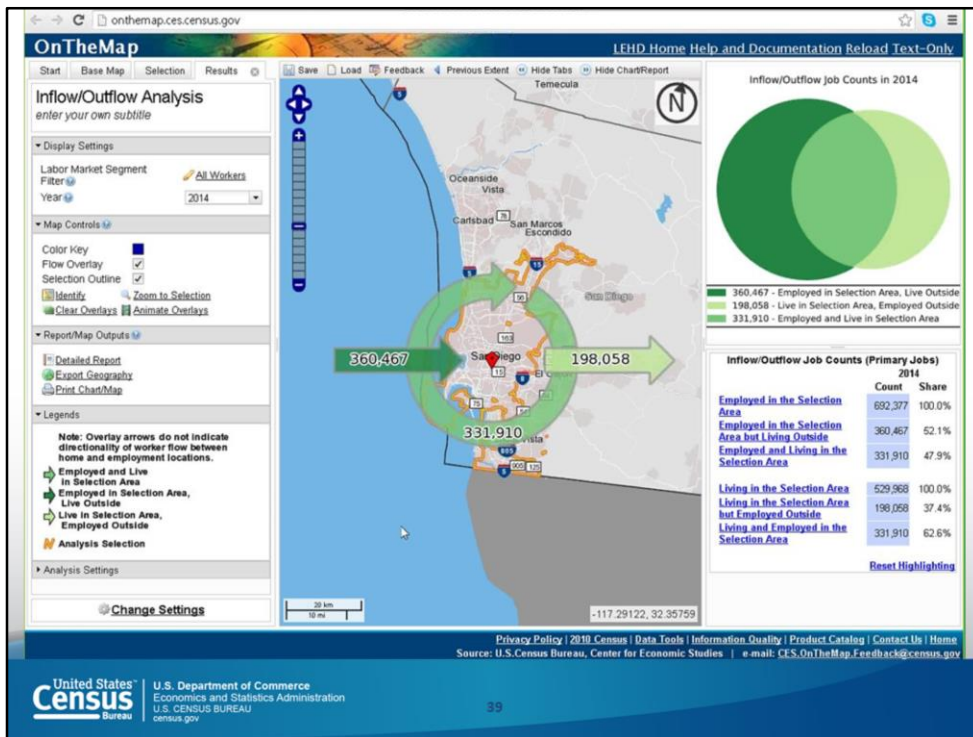
This is the Inflow and Outflow diagram. It shows that there are 331,910 people that live and work in the City of San Diego, 360,467 come from somewhere else to work here, and 198,058 live here but work somewhere else.
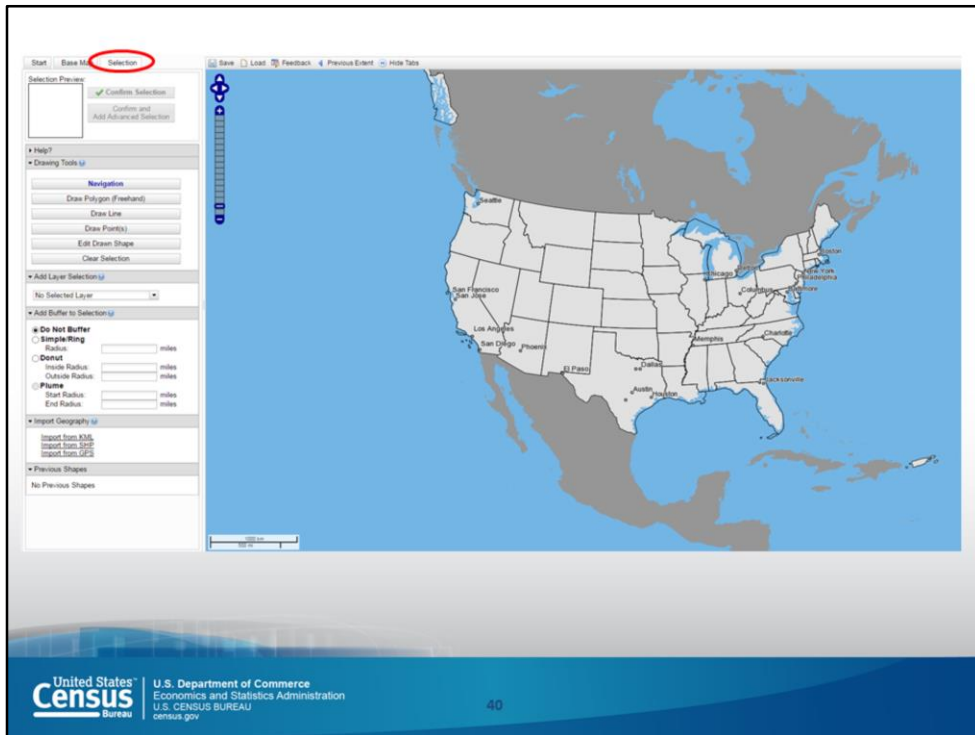
Many of you probably want to look at a smaller area. Let's start fresh to show the steps. Exit out of On The Map and open it again and choose Selection.
Zoom in as close as needed and to specify the exact area. Double clicking on the area is one way to slowly zoom into the map.
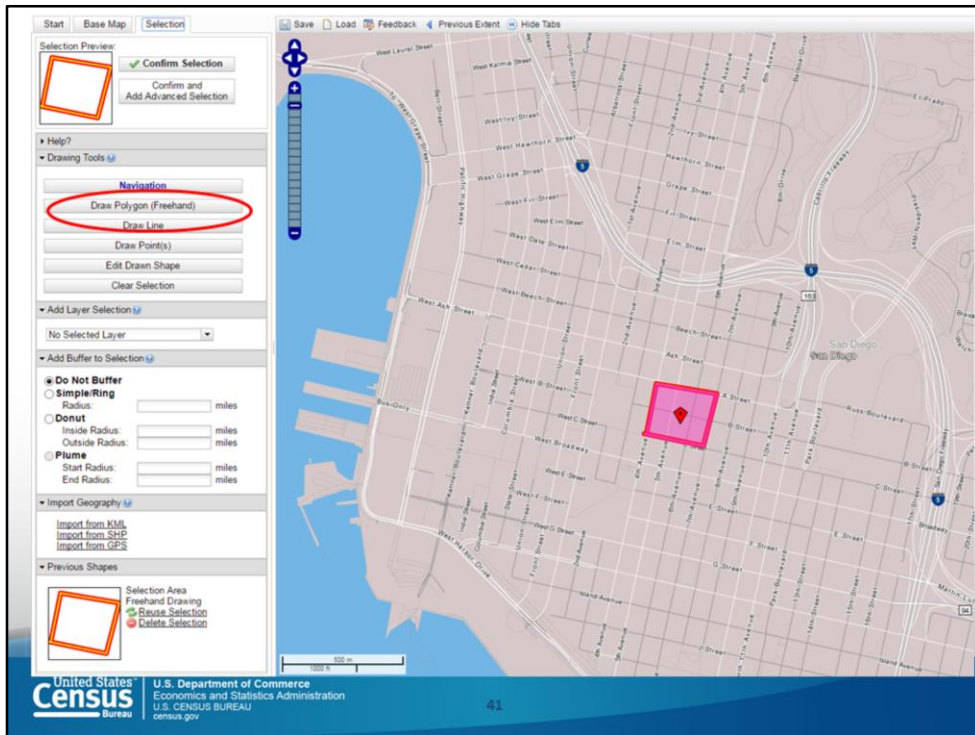
Click on Draw Polygon (Freehand). You'll set each point of the polygon yourself – you have to click to set it and move on to the next one.

In the example on this slide, we are looking at a few blocks in downtown.

When you are finished, click on Confirm Selection and Perform Analysis on Selection Area.
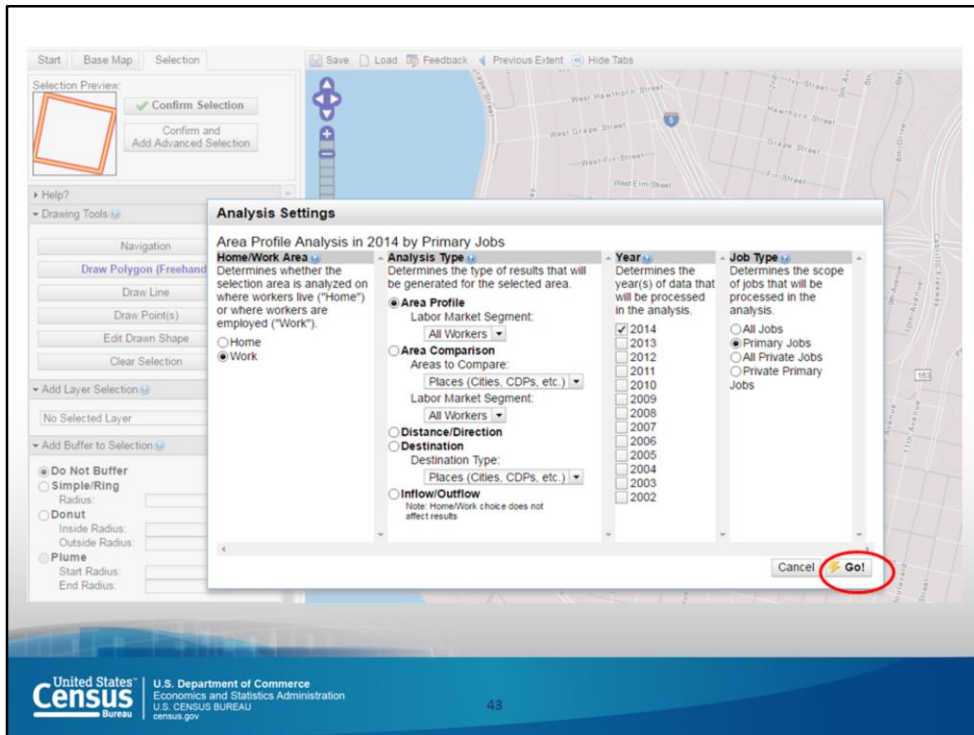
You can just leave everything in the settings box on default and hit Go.
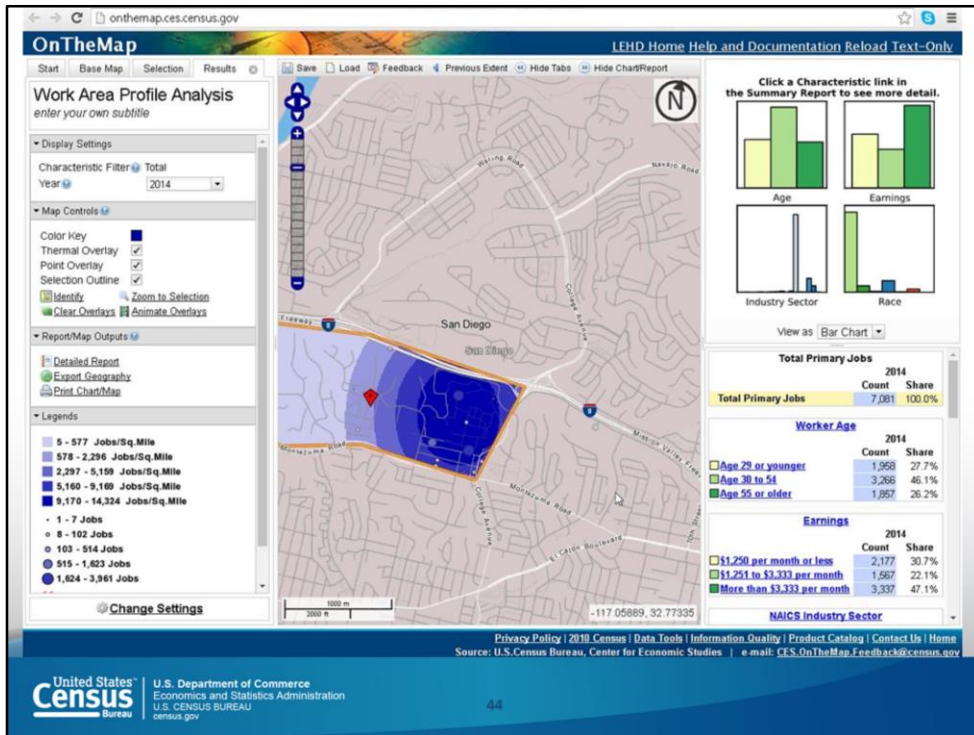
And from here you can look at the various data offered. And keep in mind that 2014 is the most recent data we have right now.

If you want to look at different years, choose Change Settings in the bottom left and specify the years that you want to compare.
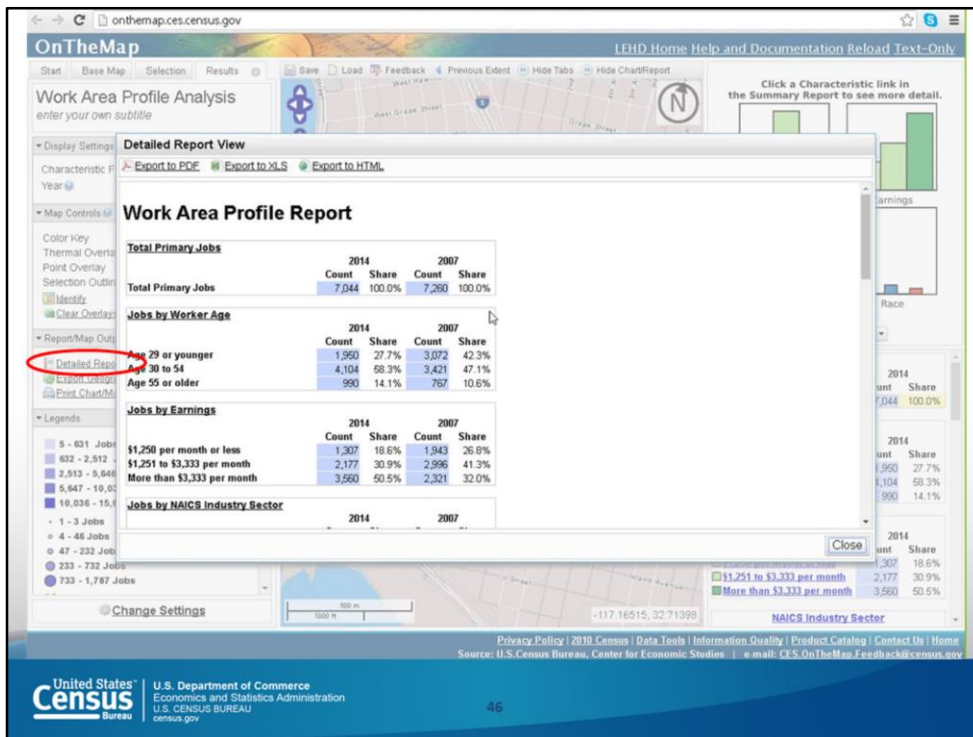
If you pick more than one at a time you'll be able to see the comparisons under the detailed report.

If you want to download or save the data, this detailed report has a few options at the top. You can export to a PDF file, export to an Excel file, or export to an HTML file. Simple click on the one that you want and it'll download.

Overview

- What Is LED?
- **Applications and Data Analysis Tools**
    - Quarterly Workforce Indicators (QWI)
    - On The Map
    - **On The Map for Emergency Management**
    - LED Extraction Tool
- Real World Examples

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In addition to the general On The Map tool, we have a version especially designed for emergency management.

On The Map for Emergency Management is a public data tool that provides an intuitive web-based interface for viewing the potential effects of disasters on the U.S. workforce and population. Users can easily retrieve reports containing detailed workforce, population, and housing characteristics for hurricanes, floods, wildfires, winter storms, and federal disaster declaration areas.

OnTheMap for Emergency Management automatically incorporates real time data updates from the National Weather Service's (NWS) National Hurricane Center, Department of Interior (DOI), Department of Agriculture (DOA), and the Federal Emergency Management Agency (FEMA). The following list summarizes the types of analysis available through this tool.

Assessing Workforce Impacts

- Identify the number and location of affected workers
- Examine workforce demographics
- Identify affected Industries
- Visualize where affected workers live

Assessing Population & Housing Impacts

- Identify the number and location of affected residents
- Examine population demographics of affected areas
- Identify vulnerable population groups
- Examine housing characteristics of affected areas

Emergency Preparedness & Response Planning

- Where should response efforts concentrate?
- Are there special or vulnerable population segments?
- Uncover surrounding communities with secondary affects to workforce

To access On The Map for Emergency Management, go back to the landing page (lehd.ces.census.gov) and click on OnTheMap for Emergency Management, using Chrome or Firefox. The specific address for this tool is: http://onthemap.ces.census.gov/em.html

The tool is the result of a collaboration between federal and private organizations. Things like NOAA and the National Weather Service, and the National Hurricane Center, Department of Interior and Department of Agriculture, and FEMA.
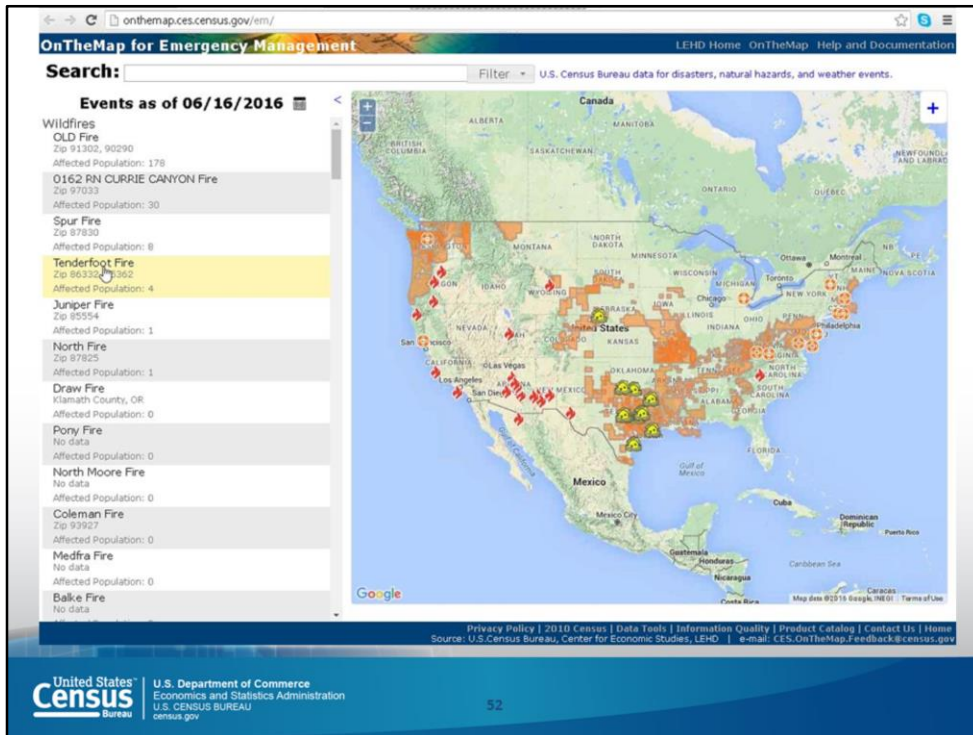
The link immediately takes you to this map of the U.S. displaying all the federal disasters, which is updated every 4 to 8 hours. In addition, historical data is included that you can get to through the search bar.

Data from the American Community Survey provides details regarding age and race in the areas that are affected. This information is used to look at places that are more susceptible to damage, like mobile home parks as opposed to brick and mortar houses.

The search bar can also be used to search on specific locations (e.g., to look at the path of a hurricane and who might be affected by it, like children or older people). You can also use this tool to see how many people were impacted by a disaster.

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Moving on to the Extraction Tool.

LED Extraction Tool

- The LED Extraction Tool enables streamlined access to raw public-use data produced by the Local Employment Dynamics Partnership. This tool provides comma separated-value files (CSV) for the exact variable and characteristics requested by the users.

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You'll want to use this tool to download data for analysis in other applications.

The tool provides access to the raw data for all 32 quarterly workforce indicators, across years. And it is fast and easy to use. Let's check it out now.

Using Chrome or Firefox, go to the landing page (lehd.ces.census.gov) and choose
LED Extraction Tool or go directly to the site at this address: ledextract.ces.census.gov
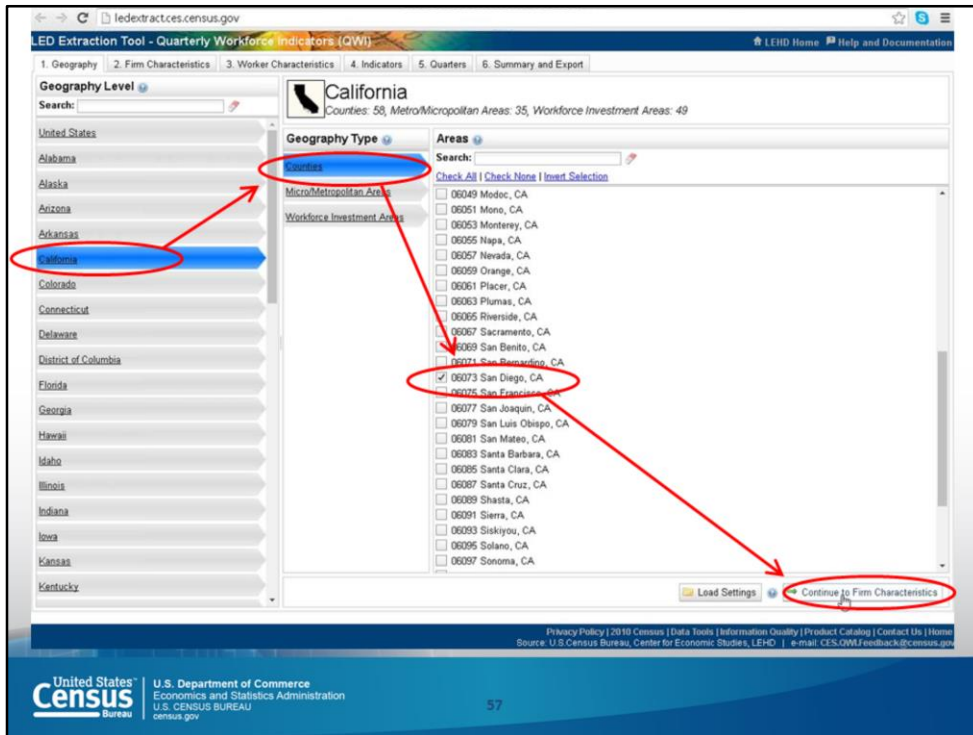
The first step is to pick a state. From there you can refine your query to the relevant county, micro/metropolitan area, or workforce investment area. Let's look at San Diego then Continue to Firm Characteristics.
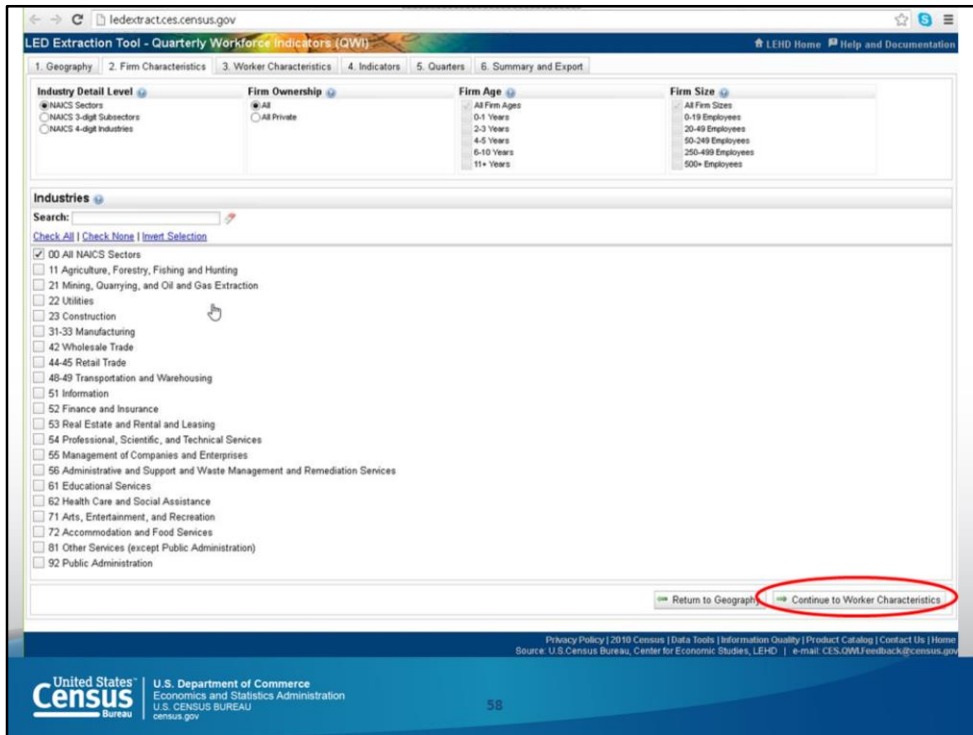
Now, we can select a specific industries (by NAICS code), firm ownership, age and size. Let's keep all the default settings and Continue to Worker Characteristics.
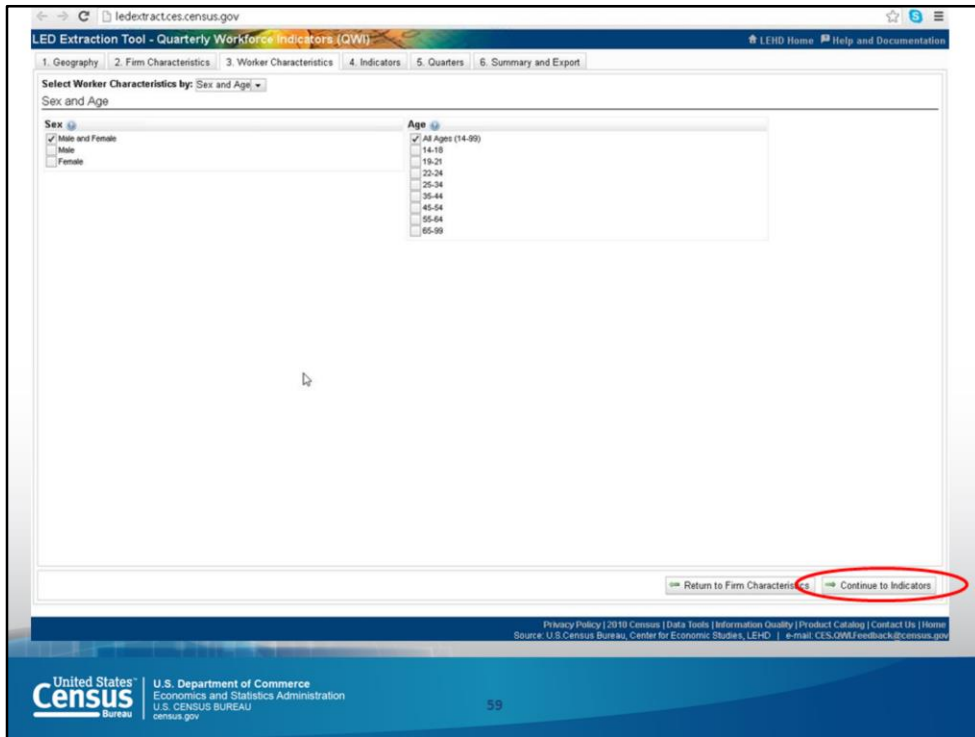
Next, we are given the opportunity to restrict the analysis by gender and age. Again, let's accept the default settings and press Continue to the Indicators.

This next page provides the definition of the indicators before providing the data. To move on, click on Continue to Quarters.

The default is the most recent data, which (as of today) is last quarter of 2014 and the last three quarters of 2015. For now, click on Continue to Summary and Export.
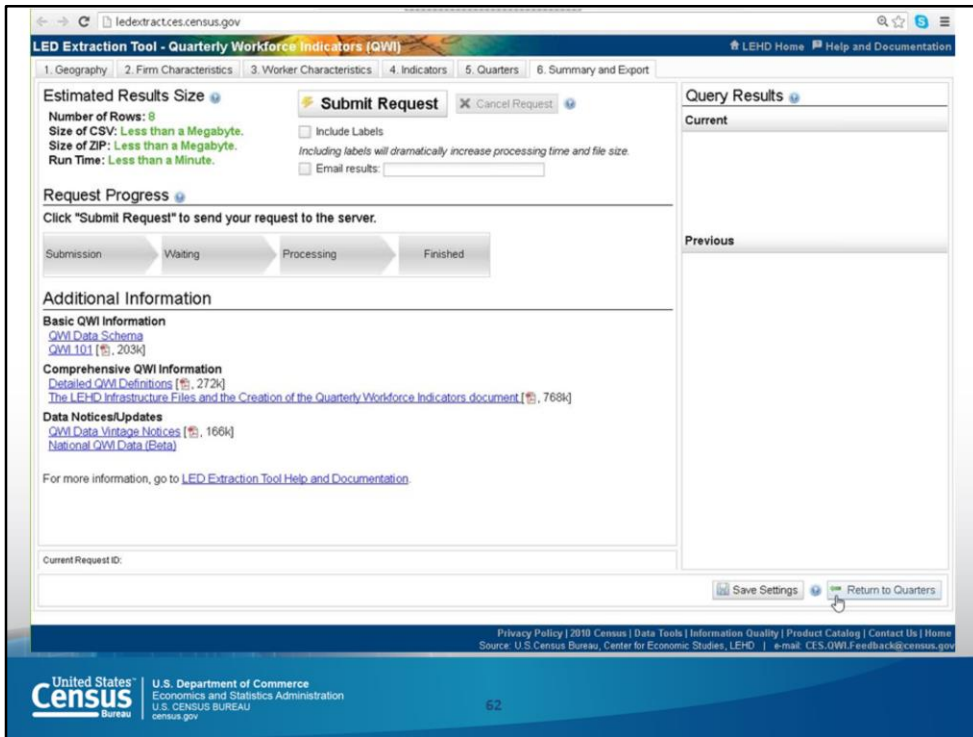
At this point, enter your email address and the data should arrive in your inbox within a few seconds.

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Before ending this workshop, I'll share some real world examples of the data from these tools are used.

Real World Examples

- Learn More - Longitudinal Employer-Household Dynamics
  - Annual LED Conference
  - Application and Documentation
  - Learning Guides
  - Technical User Guides
  - Webinars
- Council for Community and Economic Research
  - **If You Build It Will They Come?** Examining Urban Economic Growth and Development from Sports Stadiums and Arenas
  - **The Spatial Structure of American Employment**
  - **Job-to-Job (J2J):** An Introduction to Using the Data
  - **Using LODES Data** for Outcome Tracking and Community Engagement in the Promise Zones Initiative
  - **Using LEHD Data** to Analyze Economic Development Districts

The Census Bureau convenes an annual workshop with state partners, federal agencies, and public and private organizations with shared interest every calendar year. The purpose of the annual workshop is to review progress, showcase use of data and analyses, solicit input and ideas, explore new concepts and uses, and discuss research and development directions for the coming years.

The Census Bureau also conducts training for workforce investment boards (WIBs) to help them use the Local Employment Dynamics information they need for decision-making.

The Council for Community and Economic Research (C2ER) is a membership organization that promotes excellence in community and economic research by working to improve data availability, enhance data quality, and foster learning about regional economic analytic methods. C2ER accomplishes this mission through the following.

- Conducting training, advocacy, and research
- Delivering innovative products and services for researchers
- Developing professional networks

This slide lists the ways they use the data discussed today.

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If you have further questions, feel free to contact me using the information on this slide.