Using the NOEP Apps and Visualizations

Overview

The National Ocean Economics Program (NOEP) has a new and improved web site. The new NOEP site provides a great deal of new data along with its traditional offerings. Along with the new data, the site offers new ways of interacting with the data. In addition to downloading data, users can plot it interactively and even create tables on the website. Users may retrieve the entire dataset or they can search for specific entries and visualize them interactively.

NOEP accomplishes this using a new data API to deliver data to a set of interactive apps developed in R Shiny. R is a popular programming language for data analytics, statistics, and data science. Shiny is a code framework which connects R to the web.

NOEP offers the following data:

- Ocean Economy—GDP, Employment, Establishments by sector and industry
- Coastal Economy—GDP, Employment, Establishments by sector
- Population and Housing—Coastal population and housing data
- Marine Economy Satellite Account—Value added, Gross Output, employment, and more
- Electric Power Generation—Maps of power on the coast, offshore wind, and more
- Oil and Gas—Production data on offshore oil and gas and maps of offshore oil rigs.
- Fisheries—Landings, market values, and ports.
- Ports and Cargo—Cargo volumes, and market values of imports and exports.
- Climate Change—Sea level rise vulnerability maps and data in the Mid-Atlantic region

Data Visualization

Users will notice the visualizations right away when they visit the site. Users may control these visualizations and change them on the fly. Users can change variables plotted, change the style in of the plot in some visualizations, and can narrow the data down by time, region, and theme.
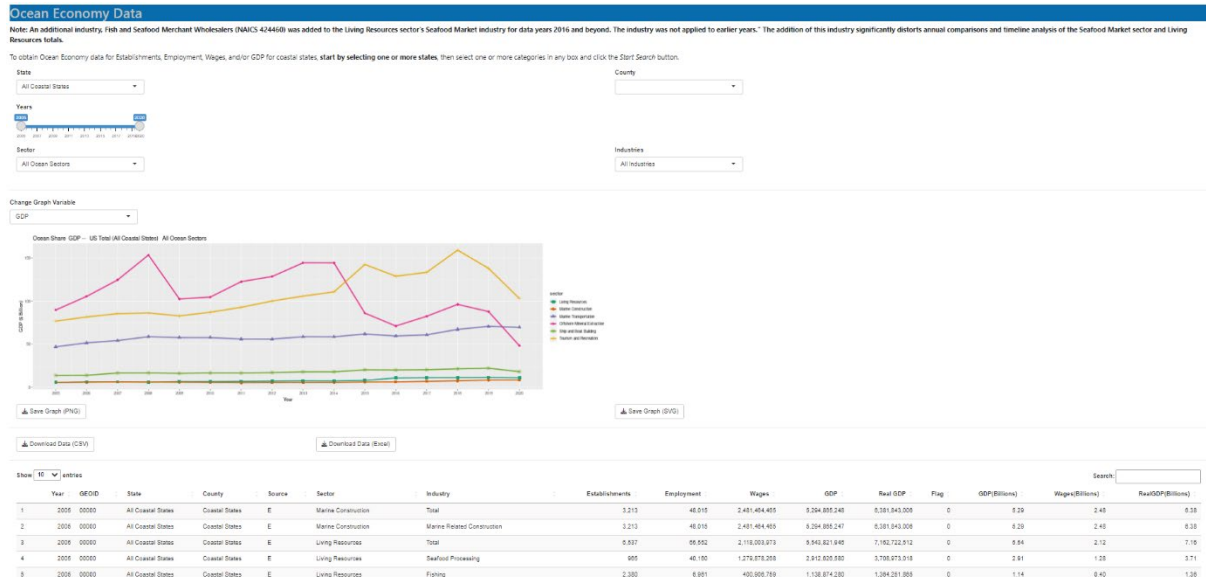

Figure 1 NOEP Ocean Economy Trends

The figure above shows the Ocean Economy visualization. The app not only visualizes the data, but provides it in tabular format and allows users to download it as either an Excel spreadsheet or in CSV format. Users may also save the plots they make either as a PNG graphics file or as an SVG vector graphics file. The latter makes it was to include the graphs in reports and articles.

Using the Apps

The NOEP website apps are versatile data services with many options. Most of the visualizations consist of simple line plots which track linear trends. In some cases, users will want to know the share of something relative to the total. In these cases, NOEP visualizes the data as stacked bar charts. However, users can also change the plots to lines.
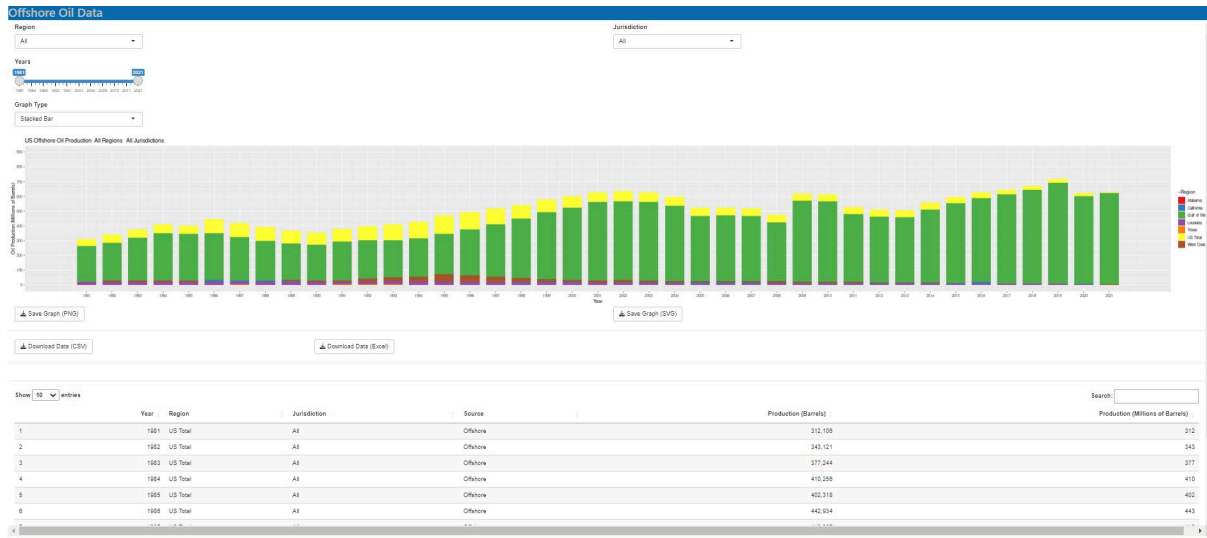
Figure 2 Oil Production as a stacked bar chart

Oil production is a good example. The chart above shows production by region as a share of total US Offshore production. A user can take a different look at the same data by rendering it as a line chart.
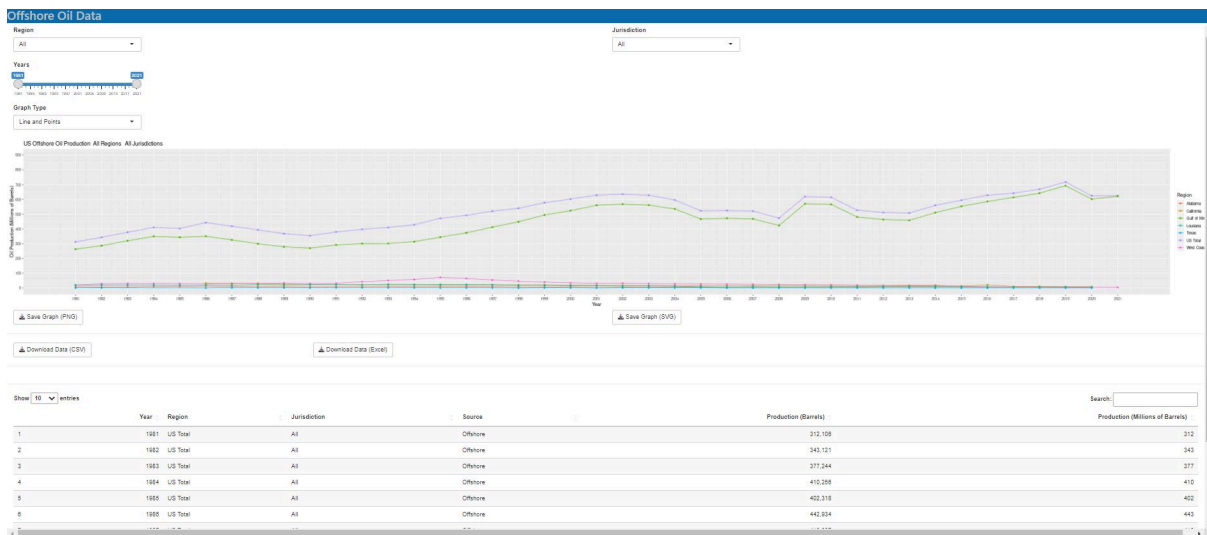

Figure 3 Oil production as a line plot

Meanwhile, some data consists of cross sections at a particular point in time. In this case, NOEP presents the data as a table.

Marine Economy Satellite Account Tables

Economic Activities
Total Marine Economy ▾

Economic Industries
Total for All Industries ▾

Years
2014 ─────── 2019
2014 2015 2016 2017 2018 2019

Marine Economy by Activity

⬇ Download Data (CSV)   ⬇ Download Data (Excel)

Show 10 ▾ entries   Search: [   ]

	Year	Ocean Related Economic Activities	Real Gross Output (Millions of $)	Nominal Gross Output (Millions of $)	Nominal Value Added	Value Added (Percent MESA)	Value Added (Percent GDP)	Chain Quantity Index	Chain Quanty (% Change)	Chain Price Index	Chain Price (% Change)
1	2014	Total Marine Economy	626,263	626,263	359,773	2	100	100		100	
2	2015	Total Marine Economy	628,753	628,753	7,267	2	100	100	0	94	-6
3	2016	Total Marine Economy	615,566	615,566	2,099	2	100	98	-2	93	-1
4	2017	Total Marine Economy	615,646	615,646	271	2	100	98	0	96	4
5	2018	Total Marine Economy	624,256	624,256	18,997	2	100	100	1	101	6
6	2019	Total Marine Economy	655,794	655,794	4,573	2	100	105	5	102	1

Showing 1 to 6 of 6 entries   Previous 1 Next

Marine Economy by Industry

⬇ Download Data (CSV)   ⬇ Download Data (Excel)

Show 10 ▾ entries   Search: [   ]

	Year	Ocean Related	Real Gross Output	Nominal Gross Output	Nominal Value	Value Added (Percent	Value Added	Chain Quantity	Chain Quanty (%	Chain Price	Chain Price (%

Marine Economy Satellite Account Employment Table

Economic Industries
All Industries ▾

Years
2014 ─────── 2019
2014 2015 2016 2017 2018 2019

Employment by Industry

⬇ Download Data (CSV)   ⬇ Download Data (Excel)

Show 10 ▾ entries   Search: [   ]

	Year	Industry	Employment (Thousands)	Compensation (Millions of Dollars)
1	2019	Private industries	1,812	98,601
2	2019	Agriculture, forestry, fishing, and hunting	15	1,030
3	2019	Farms	2	88
4	2019	Forestry, fishing, and related activities	13	942
5	2019	Mining	77	12,517

Figure 4 Marine Economy Satellite Account tables

Navigating the Apps

Each of the apps uses hierarchical menus to guide a user through the search process. This means that the menus usually come as pairs on the same line. Choices made on the first menu populate the second one. For example, a user may want to examine ocean economy trends in a particular county in California. Selecting the state in the first menu will cause the second menu to show the coastal counties in that state. The figures below demonstrate this.
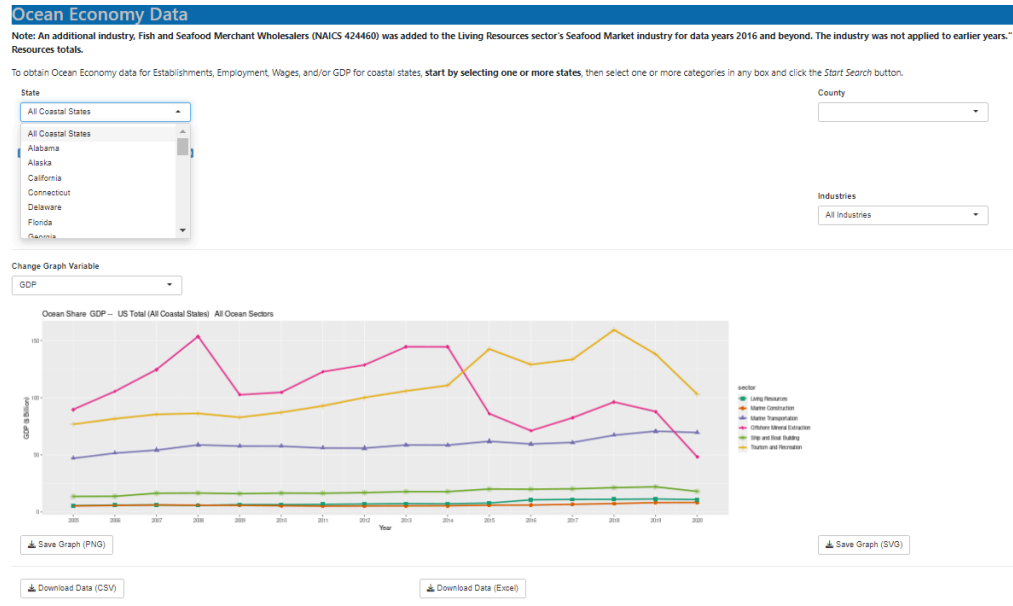

Figure 5 Selecting a state ocean economy.

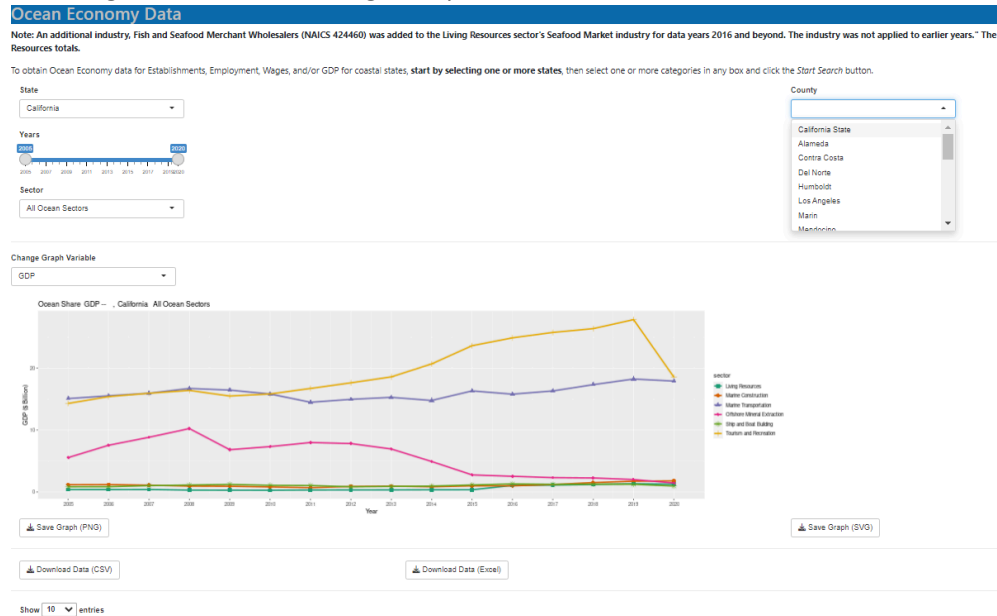Selecting 'California' will change the plot to show the trends in that state.

Figure 6 Selecting a county in the ocean economy visualization

To more closely examine trends, users may adjust the timeframe of the plot using the year slider. To change the years shown, click on one end of the slider, hold the mouse button down and drag the slide to show the years desired. The left end changes the start year and the right end changes the end year.
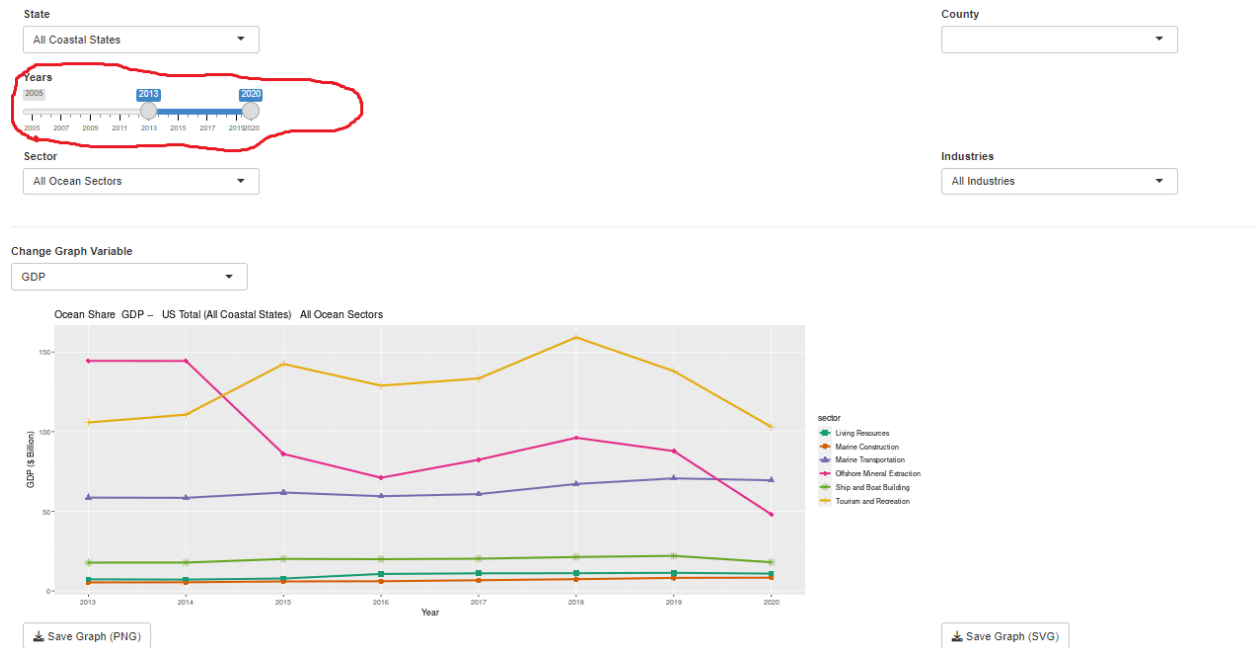

Figure 7 Using the year slider

Each of the NOEP apps track multiple variables. Users may choose which variable to plot with the "Change Graph Variable" menu. This sits just above the graph.
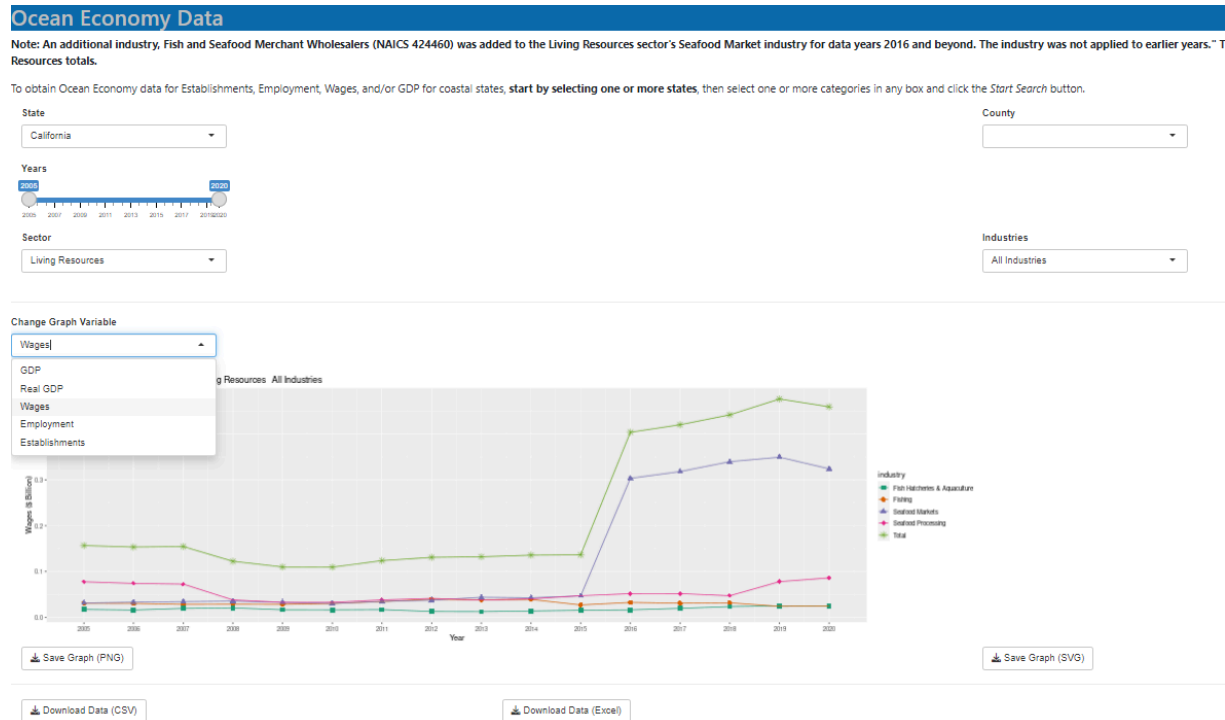

Figure 8 Changing the graph variable in the ocean economy app

Once users have a graph they like, they can save their work either as a PNG graphics file or as an SVG vector graphics file. The save buttons sit just below the graph. For including graphs in papers, the SVG option will provide the best results.

Figure 9 Saving the plot

Users may also download the data. Just above the table users will find two buttons which allow them to download data into either CSV or Excel data formats.