

Clean Coast Economy

Technical Methodology



Oceana’s 2021 Clean Coast Economy analysis estimates the number of jobs and the portion of gross domestic product (GDP) that relies on healthy ocean resources, including fishing, tourism and recreation in the United States. This document details the data sources and calculations used in this analysis as presented in Oceana’s “[Offshore Drilling Fuels the Climate Crisis and Threatens the Economy](#)” report.

Oceana defines Clean Coast Economy to include ocean-dependent commercial and recreational fishing, tourism, and recreation sectors. The analysis is based on National Oceanic and Atmospheric Administration (NOAA) Ocean Economy job and GDP data, focusing on a subset of the ocean economy that relies on a clean and healthy ocean. Total Clean Coast Jobs and GDP are calculated for each coastal state, coastal region and at the national level.

- Total Clean Coast Jobs:
 - Clean Coast Jobs include employed and self-employed workers in the Living Resources and Tourism and Recreation sectors, as defined by NOAA.¹
 - We estimated the Total Clean Coast Jobs by incorporating the indirect and induced jobs by using economic multipliers derived from National Ocean Economics Program (NOEP) data. Induced jobs are those created in other industries by the increased spending of the employees in the Clean Coast industries.
- Total Clean Coast GDP:
 - The Clean Coast GDP is defined as the GDP from the Living Resources and Tourism and Recreation sectors, according to NOAA.
 - Total Clean Coast GDP includes the indirect and induced GDP from increased spending in the area created by the Clean Coast industries. by using economic multipliers from NOEP.

1. TOTAL CLEAN COAST JOBS

The NOAA Office of Coastal Management Digital Coast data portal includes a dataset titled “[Economics: National Ocean Watch \(ENOW\)](#)”.² ENOW uses Quarterly Census of Employment and Wages data compiled by the Bureau of Labor Statistics to quantify the U.S. jobs dependent on the ocean and Great Lakes. ENOW computes an annual average using monthly job data, including both the full-time and part-time jobs. In ENOW, jobs are averaged across the year, for example three workers employed for a four-month summer season count as one job. All ENOW data were downloaded through the [Quick Report Tool for Socioeconomic Data](#).

Technical Methodology

Our calculations use data from the Living Resources and Tourism and Recreation sectors. The Living Resources sector includes commercial fishing, fish hatcheries, aquaculture, seafood processing, and seafood markets.¹ Tourism and Recreation includes eating and drinking establishments, hotels and lodging, marinas, boat dealers, campsites and RV parks, scenic water tours, manufacture of sporting goods, amusement and recreational services, recreational fishing, charter boats, zoos, and aquariums.¹ Our analysis uses the direct employment data from the two sectors in 2017, which are the most recent data available. Given the current year (2021) and potential impact of the COVID-19 pandemic on the national economy, the 2017 data may not fully represent the current fishing, tourism, and recreation markets.

1.1 Direct Employment and Self-Employed Workers

The ENOW data portal provides information on employed workers and self-employed workers.² Over one-third of the 2017 Living Resources sector workforce is self-employed because many workers in seafood harvesting are classified as self-employed.² Self-employment totals from the ENOW portal were added to the employed workers to arrive at direct employment in each sector by state and region.

Direct employment = employed workers + self-employed workers

1.2 Indirect and Induced Effects

We estimate the total impacts of tourism, fishing and recreation on the economy by incorporating multiplier effects, or the effects of indirect and induced employment and GDP.³ For example, when a new beachfront hotel is developed, the resulting additional hotel jobs and income earned by hotel employees are considered direct effects on the ocean economy. Growth in industries related to the commercial enterprise (e.g. supply chain or services), such as additional jobs and income in the industrial laundry or beverage supply industries, are measured as indirect effects of the new hotel. Finally, the induced effects of the hotel are the increases in economic activity because of higher income or employment rates in hotel, support services such as laundry and beverage employees, as well as the higher regional spending on groceries, transportation, housing, etc.

To estimate indirect and induced effects we used economic multipliers – the ratio of the total economic impact (or jobs) of these sectors to the directly measured impact (e.g. direct employment). After establishing the direct Clean Coast Jobs in the Living Resources and the Tourism and Recreation sectors (Section 1.1) from ENOW, we used job multipliers to calculate total Clean Coast Jobs for each of the coastal state and region.

Multipliers were based on National Ocean Economics Program (NOEP) data.⁴ From 2005-2010, NOEP data included direct jobs as well and total jobs (direct, indirect and induced). We used these data to calculate the multipliers used. NOEP used the same multipliers from 2005-2010. Absent more recent multipliers we applied the NOEP multipliers to 2017 jobs data.

Technical Methodology

We used the following equations to determine total Clean Coast Jobs:

$$\text{Clean Coast Jobs multiplier} = \text{total employment} / \text{direct employment}$$
$$\text{Total Clean Coast Jobs (direct + indirect + induced employment)} = \text{employment multiplier} * \text{direct employment (Section 1.1)}$$

Each sector (Living Resources and Tourism and Recreation) has a unique multiplier. Additionally, these multipliers vary by state and region. For example, the Living Resources sector has a Mid-Atlantic regional multiplier of 1.35 and a North Carolina state-level multiplier of 1.28. Total employment was calculated for each coastal state and region with the relevant employment multipliers for each sector, see Tables 2 and 3. For a full list of the multipliers used, see Table 1.

To estimate national Clean Coast Jobs, we total regional employment from the Northeast, Mid-Atlantic, Southeast, Gulf of Mexico, West, North Pacific and Pacific regions.

1.3 Split States

Three states in the analysis are what NOAA calls “split states,” since they border multiple coasts. The ENOW data portal provides information on coastal jobs bordering the ocean and the Great Lakes. Both New York and Pennsylvania have an Atlantic and Great Lakes coast contributing to their economy. To exclude jobs dependent on the Great Lakes and focus on only ocean-related jobs, we used only the Atlantic jobs in our analysis. Florida borders the Atlantic and the Gulf of Mexico, we added both coasts’ employment numbers together to calculate the direct Clean Coast Jobs in Florida. The Florida-state level employment multiplier was used to calculate total employment.

2. TOTAL CLEAN COAST GDP

Determining the Clean Coast GDP follows similar methods as the employment calculation described above. We combined NOAA GDP data for Living Resources and Tourism and Recreation sectors to calculate direct Clean Coast GDP. Consistent with NOAA protocol, self-employment gross receipts were not included in GDP calculations, as these are not directly comparable to GDP in the employer-reported datasets.¹ In New York and Pennsylvania we used only the Atlantic Coast GDP.

We generated the Clean Coast GDP multipliers the same way as job multipliers (Section 1.2), using 2010 NOEP data:

$$\text{Clean Coast GDP multiplier} = \text{Total GDP} / \text{Direct GDP}$$
$$\text{Total Clean Coast GDP per sector per state} = \text{GDP multiplier} * \text{Direct GDP}$$

Technical Methodology

GDP multipliers were calculated for each sector (Living Resources, and Tourism and Recreation) within each state and region. For a full list of the multipliers used, see Table 1. Total Clean Coast GDP was calculated for each state and region with the relevant GDP multipliers, see Tables 2 and 3.

The national Clean Coast GDP was estimated by adding the regional GDP totals together from the Northeast, Mid-Atlantic, Southeast, Gulf of Mexico, West, North Pacific and Pacific.

For additional information, please visit oceana.org/climatecrisis or contact Oceana's Marine Scientist Sarah Giltz at sgiltz@oceana.org

Sources:

1. NOAA (2020) National Oceanic and Atmospheric Administration, Office for Coastal Management. "NOAA Report on the U.S. Marine Economy." Charleston, SC: NOAA Office for Coastal Management. Available: <https://coast.noaa.gov/data/digitalcoast/pdf/econ-report.pdf>. Accessed Dec 8, 2020.
2. NOAA National Oceanic and Atmospheric Administration. Economics: National Ocean Watch (ENOW) Data. Based on data from the Bureau of Labor Statistics and the Bureau of Economic Analysis. Charleston, SC: NOAA Office for Coastal Management. Available: <https://www.coast.noaa.gov/digitalcoast/data/enow.html>. Accessed Dec 8, 2020.
3. Colgan CS (2007) A Guide to the Measurement of the Market Data for the Ocean and Coastal Economy in the National Ocean Economics Program (NOEP). : 49.
4. NOEP National Ocean Economics Program. Available: <https://www.oceaneconomics.org/Market/ocean/oceanEcon.asp>. Accessed Dec 8, 2020.

Appendix

Table 1: Multipliers used to calculate indirect and induced Clean Coast Jobs and GDP, based on 2010 NOEP data.

GEOGRAPHIC SCALE	EMPLOYMENT MULTIPLIER		GDP MULTIPLIER	
	Living Resources	Tourism & Recreation	Living Resources	Tourism & Recreation
Regional				
Gulf of Mexico	1.286	1.297	1.633	1.75
Mid-Atlantic	1.351	1.403	1.784	2.025
North Pacific	1.881	1.324	2.747	1.71
Northeast	1.394	1.425	1.792	2.025
Pacific	1.339	1.535	1.635	1.8
Southeast	1.395	1.493	1.754	1.974
West	1.482	1.414	1.779	2.045
State				
Alabama	1.699	1.565	1.276	1.712
Alaska	1.837	1.315	2.706	1.699
California	1.478	1.454	1.786	2.133
Connecticut	1.311	1.335	1.626	1.903
Delaware	1.257	1.486	1.290	1.686
Florida	1.426	1.543	1.800	2.051
Georgia	1.304	1.361	1.633	1.919
Hawaii	1.339	1.535	1.635	1.800
Louisiana	1.248	1.259	1.518	1.603
Maine	1.357	1.421	1.621	1.840
Maryland	1.363	1.378	1.674	1.926
Massachusetts	1.381	1.411	1.754	1.979
Mississippi	1.326	1.270	1.640	1.521
New Hampshire	1.297	1.338	1.579	1.755
New Jersey	1.337	1.382	1.692	1.934
New York	1.287	1.372	1.701	1.962
North Carolina	1.284	1.324	1.572	2.418
Oregon	1.397	1.404	1.659	1.924
Pennsylvania	1.286	1.347	1.586	1.909
Rhode Island	1.341	1.372	1.593	1.837
South Carolina	1.270	1.318	1.456	1.721
Texas	1.291	1.328	1.623	1.917
Virginia	1.290	1.327	1.693	1.878
Washington	1.642	1.405	1.820	1.996

Appendix

Table 2: Regional Total Clean Coast Jobs and GDP

Region	Employment	GDP (\$USD)
Gulf of Mexico	490,202	29,537,488,000
Mid-Atlantic	911,233	77,778,378,000
North Pacific	64,613	4,516,969,000
Northeast	311,391	24,053,139,000
Pacific	172,204	14,050,273,000
Southeast	524,259	34,924,864,000
West	817,711	68,141,688,000
National Total	3,291,613	253,002,797,000

Table 3: State Total Clean Coast Jobs and GDP

State	Employment	GDP (\$USD)
Alabama	28,201	1,496,714,000
Alaska	63,625	4,465,064,000
California	653,671	54,303,375,000
Connecticut	53,933	4,205,613,000
Delaware	28,609	1,365,041,000
Florida	659,131	43,164,311,000
Georgia	26,775	1,566,446,000
Hawaii	172,204	14,050,273,000
Louisiana	78,352	4,898,081,000
Maine	59,813	3,806,988,000
Maryland	103,632	6,992,365,000
Massachusetts	123,956	10,341,600,000
Mississippi	25,549	1,234,484,000
New Hampshire	12,429	844,614,000
New York (Atlantic only)	46,7213	47,944,240,000
New Jersey	138,465	8,352,417,000
North Carolina	61,804	3,130,865,000
Oregon	43,991	2,730,637,000
Pennsylvania (Atlantic only)	56,929	4,362,154,000
Rhode Island	52,992	3,468,407,000
South Carolina	96,781	6,696,269,000
Texas	76,234	4,492,054,000
Virginia	91,898	5,508,652,000
Washington	138,565	12,586,147,000