



**Describing the Ocean Economies
of the U.S. Virgin Islands
and Puerto Rico
*Executive Summary***

Submitted to:

**NOAA Office of
Coastal Management**

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1. Background and Objectives

NOAA's Office of Coastal Management (OCM) maintains the Economics: National Ocean Watch (ENOW) dataset, which provides time-series data for six economic sectors within the United States that are dependent on the oceans and the Great Lakes. ENOW currently covers the 30 coastal states within the United States; it does not provide information for the Territories of the United States, including the U.S. Virgin Islands (USVI), Puerto Rico, Guam, American Samoa, and the Northern Marianas Islands.

Recognizing the high level of ocean-dependency in these areas, OCM developed a summary of BLS Quarterly Census of Employment and Wages (QCEW) data for ocean-dependent sectors in the USVI and Puerto Rico, using the same ENOW classification scheme that it uses to assess the ocean-dependency of coastal areas for U.S. coastal states. However, given their unique nature as islands, the USVI and Puerto Rico are more reliant on ocean-related activity than most U.S. states. The USVI and Puerto Rico also have a large number of small, independently owned businesses and a relatively high level of informal economic activity, which is not reflected in the QCEW data.¹

For these reasons, OCM retained Abt Associates (Abt), Advantage Business Consulting, and Dr. Charles Colgan with the Middlebury Institute of International Studies Center for the Blue Economy (the project team) to gain a better understanding of the true ocean-dependency of the economies of the USVI and Puerto Rico and to assess the applicability of the traditional ENOW framework for these locations.

2. Methods

Members of the project team met with representatives from 22 organizations in Puerto Rico and the USVI in November and December of 2015. Through our various discussions, we obtained information and local data on economic activity that depends on the ocean, including formal and informal activity in ENOW-defined sectors, as well as in sectors that OCM does not currently include in the ENOW classification scheme, but that are ocean-dependent in the small island economies of the USVI and Puerto Rico. In addition to the in-person meetings, we analyzed federal and local data sources that provided further insights on the ocean-dependency of the territories' local economies.

3. Key Findings

A review of the QCEW data suggests that ENOW-defined ocean-dependent activity accounts for a relatively modest portion of the overall economies of the USVI and Puerto Rico. For example, as shown in Exhibit ES-1, the 2012 QCEW reported 404 establishments and 6,738 employees in ENOW-defined industries in the USVI. This accounts for approximately 11% and 19% of the total establishments and employment that BLS reported for the territory in that year. Similarly,

¹ When developing ENOW data for coastal states, OCM uses Census Non-Employer Statistics (NES) to capture self-employment activity; however, this data is not available for U.S. territories. In addition, the Bureau of Economic Analysis (BEA) does not develop gross domestic product (GDP) data for U.S. territories at a level of detail that allows OCM to develop estimates of the ocean economy's GDP.

the QCEW data indicates that ENOW-defined economic activity in Puerto Rico accounted for approximately 8.8% of total business establishments and 7.2% of employment in 2012.

Exhibit ES-1. Establishments, employment, and total average annual wages by ENOW sector, USVI and Puerto Rico

| ENOW sector | Establishments | Employment | Total wages (\$) |
|----------------------------|----------------|-----------------|------------------------|
| USVI | | | |
| Living resources | 1 | ND ^a | ND |
| Marine construction | 2 | ND | ND |
| Marine transportation | 22 | 214 | \$11,030,080 |
| Offshore mineral resources | 5 | ND | ND |
| Ship and boat building | 1 | ND | ND |
| Tourism and recreation | 373 | 6,524 | \$161,751,217 |
| Total | 404 | 6,738 | \$172,781,297 |
| Puerto Rico | | | |
| Living resources | 14 | 10 | \$145,331 |
| Marine construction | 19 | 642 | \$19,816,175 |
| Marine transportation | 123 | 3,406 | \$103,046,969 |
| Offshore mineral resources | 43 | 17 | \$334,582 ^a |
| Ship and boat building | 5 | ND ^b | ND |
| Tourism and recreation | 4,091 | 62,645 | \$798,495,848 |
| Total | 4,295 | 66,720 | \$921,838,905 |

a. For industries below a certain size, BLS does not disclose employment and wage data for privacy purposes. These occurrences are noted using “ND” for non-disclosed.

Based on the in-person meetings and the project team’s subsequent research, it is clear that the QCEW data and existing ENOW classification scheme underestimate the ocean-dependency of the islands’ local economies. In the USVI, most economic activity in the territory can in some way, whether directly or indirectly, be linked to the ocean. Tourism is the primary driver of local economic activity, accounting for 60% to 80% of the islands’ GDP. Our research in Puerto Rico generated similar findings, although the portion of Puerto Rico’s economy that is ocean-dependent is much lower than in the USVI because Puerto Rico’s economy is much more diverse. However, tourism is also a primary driver of economic activity on the island. In both territories, activities associated with the ENOW marine transportation, ship and boat building and repair, and living resources sectors also generate meaningful economic activity.

The QCEW data and existing ENOW classification scheme appear to underestimate the ocean-dependency of the USVI and Puerto Rico for several reasons:

- There are a large number of self-employed individuals in some ENOW-defined sectors, particularly the tourism and recreation and living resources sectors. The BLS QCEW data does not capture information on sole proprietorships.
- There is also a relatively high percentage of informal economic activity in the USVI and Puerto Rico. This typically includes small businesses that do not report employment to the federal government.
- The ENOW classification scheme does not include many industries that are entirely or partially ocean-dependent in the USVI and Puerto Rico because of their unique nature as

islands and tourist destinations. For example, the tourism industry supports a significant portion of activity in the retail trade and the airline industries.

- Many companies that ENOW intends to capture are registered under NAICS codes that OCM does not include in the ENOW classification scheme.
- BLS does not disclose employment and wage data for many NAICS industries because of the small number of establishments.

4. Recommendations

The project team identified local data sources and potential changes to the ENOW methodology for the USVI and Puerto Rico that will allow OCM to better capture ocean-dependent economic activity. Our specific recommendations are outlined below.

Review and Incorporate Additional Data Sources. There are several potential data sources that agencies in the USVI and Puerto Rico publish on an annual basis, and that OCM could potentially draw upon to develop a more comprehensive accounting of ocean-dependent activity (Exhibit ES-2). We have analyzed and incorporated findings from many of these data sources into the overall project report. However, we recommend that as a next step, OCM undertake a more comprehensive review of these various sources (and others) to better understand how they might be more systematically incorporated into the ENOW dataset. Some of these sources are particularly important for capturing sole proprietorships.

Expand ENOW Framework to Include Additional NAICS Industries. There are many industries in the USVI and Puerto Rico that are *completely* dependent on the ocean but that are not represented in ENOW. This is particularly true in the USVI, where the local economy is largely dependent on ocean-based tourism. As shown in Exhibit ES-3, we recommend that OCM consider including several additional NAICS code industries in the ENOW classification scheme for the USVI, and in some cases, for Puerto Rico.

Exhibit ES-2. Summary of alternative data sources that provide information on ocean-dependent economic activity

USVI

- Business registration data from the Department of Licensing and Consumer Affairs
- Department of Planning and Natural Resources (DPNR) commercial fishermen registration data. DPNR can also provide data on the number of employees associated with USVI's three government-run fish markets.
- USVI Bureau of Economic Research's Annual Tourism Indicators.
- Local BLS data, which includes data on the tourism industry
- Virgin Islands Port Authority annual financial reports, which include marine and aviation landings, employment, and revenues from wharfage/pilotage fees

Puerto Rico:

- Tourism data from the Puerto Rico Planning Board and Puerto Rico Tourism Company (PRTC), including PRTC "Selected Statistics."
- Puerto Rico Statistics Institute publishes Puerto Rico Ports Authority data, including passenger and cargo data (marine and aviation)
- U.S. Census Public Use Microdata Series (PUMS) data provide information on the number of employed individuals in specific NAICS industries (not available for USVI).

There are also a number of non-ENOW industries that are *partially* dependent on the ocean in the USVI and Puerto Rico. For example, in both the USVI and Puerto Rico, some portion of the retail sector is dependent on duty free shopping by tourists, but not the entire industry. This is also true for the airline industry, and several other tourism-dependent sectors. Similarly, many of

Exhibit ES-3. Additional NAICS code industries that are entirely ocean-dependent in the USVI and Puerto Rico

| ENOW sector | NAICS code | NAICS industry | Relevant territory |
|------------------------|------------|---|----------------------|
| Marine transportation | 483212 | Inland water passenger transportation | USVI and Puerto Rico |
| Tourism and recreation | 453220 | Gift, novelty, and souvenir stores | USVI only |
| | 485310 | Taxi service | USVI only |
| | 487110 | Scenic and sightseeing transportation, land | USVI only |
| | 532111 | Passenger car rental | USVI only |
| | 561520 | Tour operators | USVI only |
| | 721199 | All other traveler accommodation | USVI only |
| | 722410 | Drinking places, alcoholic beverages | USVI only |
| | 721120 | Casino hotels | USVI and Puerto Rico |

the environmental organizations and consulting firms located in the two territories likely specialize in marine-related science and conservation, while others may focus on land-based activities. To develop a more comprehensive ENOW dataset for the USVI and Puerto Rico, we recommend that OCM explore methodologies for capturing the portion of economic activity within these industries that is related to the ocean. Potential approaches include:

- For many tourism-related industries, OCM may be able to use industry location quotients (which measure the concentration of a particular industry relative to the nation as a whole) to determine the average number of establishments that would be located in a non-tourist region, and attribute any additional activity to the ocean. The use of location quotients may be more applicable in the USVI where so much of the economy is supported by tourism.
- For other tourism-related industries, such as the retail or airline industry, OCM may also be able to use tourism and expenditure data collected by local agencies to estimate the percentage of a given industry that is dependent on tourism. For example, OCM could compare retail sales to resident personal income in the USVI and Puerto Rico, and then compare that ratio to reference regions with similar levels of personal income. This would provide a measure of the excess of retail supply relative to local demand, which could then be attributed to tourism.
- In most cases, determining the percentage of non-tourism-related industries that are dependent on the ocean will require further investigation. In these cases, OCM may be able to use private databases, such as Lexis Nexus, to conduct a more thorough inventory of ocean-dependent businesses. Additional interviews or surveys of local stakeholders may also be necessary.

5. Potential Ocean-Dependent Activity and Next Steps

Exhibit ES-4 provides a range of estimates for ocean-dependent employment in the USVI and Puerto Rico and compares this data to the QCEW summary data based on the traditional ENOW framework, as follows:

- The first column shows the 2012 QCEW employment data for the traditional ENOW sectors.
- The second column shows the QCEW employment data for traditional ENOW sectors *plus* any additional employment that we learned about from our in-person meetings and local data

sources, *as well as* the QCEW employment data for the non-traditional ENOW industries that appear to be *entirely* ocean-dependent in the USVI and/or Puerto Rico. This column captures some self-employment activity based on findings from our in-person meetings. For Puerto Rico, the second column also reflects self-employment data for ENOW industries that map directly to industry categories in the U.S. Census PUMS (these are mostly within the tourism and recreation and marine transportation sectors).

- The estimates in the third column add to the total in the second column by showing the QCEW employment data for the industries we identified as being *partially* dependent on the ocean.

Exhibit ES-4 is intended to show the possible range of estimates for ocean-dependent employment, and to demonstrate the extent to which the traditional ENOW framework and OCM summary data underestimates ocean-based activity. It does not provide a comprehensive estimate of employment in ocean-dependent sectors.

Exhibit ES-4. Comparison of employment data by ENOW sector, USVI and Puerto Rico

| ENOW sector | Traditional ENOW | Traditional ENOW w/additional estimates and QCEW data for sectors entirely dependent on the ocean | Traditional ENOW w/additional estimates and QCEW data for sectors entirely or partially dependent on the ocean |
|----------------------------|------------------|---|--|
| USVI | | | |
| Living resources | ND ^a | 225 | 361 |
| Marine construction | ND | | 63 |
| Marine transportation | 214 | 417 | 417 |
| Offshore mineral resources | ND | | |
| Ship and boat building | ND | 140 | 140 |
| Tourism and recreation | 6,524 | 8,382 | 9,757 |
| Total | 6,738 | 9,164 | 10,738 |
| Puerto Rico | | | |
| Living resources | 10 | 1,151 | 4,093 |
| Marine construction | 642 | 659 | 4,023 |
| Marine transportation | 3,406 | 6280 | 11,961 |
| Offshore mineral resources | 17 | ^b | - |
| Ship and boat building | ND | ND | ND |
| Tourism and recreation | 62,645 | 102,883 | 135,578 |
| Total | 66,720 | 110,973 | 155,655 |

a. For industries below a certain size, BLS does not disclose employment and wage data for privacy purposes. These occurrences are noted using “ND” for non-disclosed.

b. Based on our in-person meetings, employment identified in the offshore mineral resources is not ocean-dependent

Based on the findings of this research and the project team’s recommendations, NOAA OCM is working to develop a more comprehensive methodology for capturing ocean-dependent economic activity in the USVI and Puerto Rico. In addition, although the findings of this research are not directly applicable to other U.S. Territories, due to differences in the local economies, the processes that the project team developed for this research (.e.g, our systematic review of QCEW data and development of statistical summaries for our in-person meetings) can serve as a starting point for assessing the ocean-dependent economic activity in these locations.