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# INVENTORY OF COASTAL RECREATION AND TOURISM DATA

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### 1.0 INTRODUCTION

The nation's coasts are host to a multitude of travel, tourism, and recreation activities, which have the potential to generate social and economic benefits as well as impact the coastal environment. As more and more communities turn to tourism for economic development, it becomes crucial to develop a sustainable tourism industry that is good for communities, the environment, and the bottom line. Decision makers, therefore, will require information on the social and economic impacts of recreation and tourism as well as scientific information about the impacts on natural resources.

In an effort to better understand existing data, NOAA Coastal Services Center (CSC) hired Eastern Research Group, Inc. (ERG) to create an inventory of publicly available regional and national data on tourism and recreation. The purpose of the inventory is to:

- Increase NOAA's understanding of the types of tourism and recreational data currently available;
- Provide additional information on socioeconomic data to CSC to enable them to better direct people to relevant data in the Digital Coast website<sup>1</sup> and in other web tools for coastal professionals and managers; and
- Provide additional data to help CSC refine current products and services.

### 1.1 SCOPE AND DEFINITIONS

This section describes the scope and definitional decisions agreed upon by ERG and CSC throughout the course of the project.

- **Types of tourism and recreation data sought:**
  - Recreational and tourism-related employment;
  - Recreational activity preferences and participation data;
  - Travel data, including the number of visitors, visitor characteristics, type of visitor stay (e.g., day trip, overnight), length of visitor stay, and visitor spending;
  - Recreational expenditures such as transportation, accommodations, food services, and entertainment costs; and
  - Macro-level environmental impacts, including physical and biological (e.g., over-use/destruction of sensitive areas, beach erosion, nutrient pollution).
- **Geographic scope of data:** Initially, nationally consistent sources of data were sought that pertained to NOAA-defined geographic regions.<sup>2</sup> As budget allowed, ERG expanded its

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<sup>1</sup> The website provides users with access to coastal data, tools, training, and case studies. See link:

<http://www.csc.noaa.gov/digitalcoast>

<sup>2</sup> NOAA has eight geographic regions, six of which contain coastal land: North Atlantic, Southeast and Caribbean, Gulf of Mexico, Western, Pacific Island, and Alaska. The coastal boundary is consistent with Coastal Change Analysis Program (CCAP) delineation.

efforts to explore data available in the Great Lakes region, California, Florida, Hawaii, Massachusetts, North Carolina, and Ohio to better understand additional data available.

- **Industry focus:** Industries having a North American Industry Classification System (NAICS) code defined in the tourism and recreation sector of the Economics National Ocean Watch (ENOW) dataset. These industries are listed in Appendix A.
- **Literature studies:** The primary type of information sought was data and/or datasets; however, academic and peer-reviewed literature was used to help fill data gaps, when possible.
- **Years:** 2000-2012; literature review was limited to 2007-2012.

## **1.2 REPORT ORGANIZATION**

Section 2.0 provides an overview of the methods used to identify data and data collection fields in the inventory template. Section 3.0 presents the results of the data search. Section 4.0 provides a conclusion, and Section 5.0 includes considerations for future work.

## **2.0 METHODS**

This section describes the methods that ERG used to 1) identify relevant coastal tourism, travel, and recreation data; and 2) develop the data inventory template to capture data sources identified throughout the project. Section 2.1 presents the methods for data collection and includes the approach used to identify data and literature. Section 2.2 describes the development of the template.

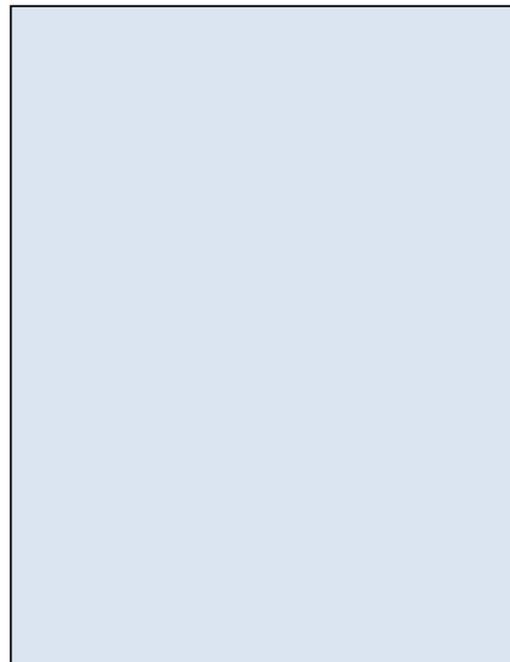
### **2.1 DATA COLLECTION**

ERG's overall approach involved searching the Internet for relevant datasets and literature, as well as discussions with selected tourism and recreational experts.

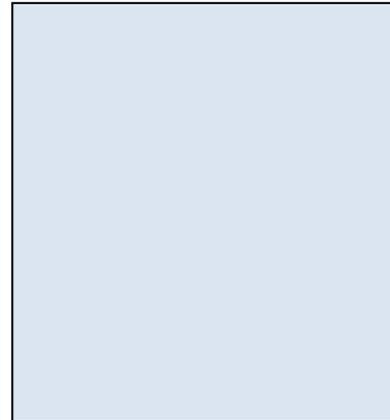
#### **2.1.1 National-Level Data**

ERG began by capturing well-known national datasets known from past projects and suggestions by CSC (see text box). ERG augmented this list of datasets by performing Internet searches that were industry- and impact-specific, as outlined below.

- **Industry-specific information.** Using the NAICS codes and industry categories in the ENOW tourism and recreation sector, ERG searched by industry for:
  - National survey data,
  - Trade associations with applicable data or reports, and



- Industry reports.
- **Purchasable travel and tourism statistics and tourism industry reports.** ERG captured relevant industry reports from prior tourism work<sup>3</sup> and subsequently searched the Internet for entities that sell comparable types of tourism and industry reports for inclusion in the data inventory.
- **Environmental impacts.** ERG performed an Internet search using key terms or combinations of them (see text box). ERG also performed key term searches on specific types of recreational impacts using the examples of impacts conveyed by CSC as guidance (e.g., nutrient loading, beach erosion).



### *Literature*

After performing preliminary data searches at the national level, ERG conducted a literature search to help identify information to fill emerging data gaps. Similar to the process used to identify national datasets, ERG began efforts to collect relevant literature by including applicable studies from previous project work. Next, ERG performed a search for applicable literature using two prominent scholarly journals, *Annals of Tourism Research* and *Tourism Management*, to gauge the type of literature available and its applicability and suitability for the purposes of this study. ERG used the following parameters when searching these journals online:

- Limited the search years to 2007-2012, and
- Searched on the same key terms as the national-level data search.

ERG then widened the search parameters using the Google search engine to identify additional applicable journals and peer-reviewed literature. This search used the same key terms and expanded the search terms on environmental impacts such as “coastal erosion,” “beach recreation,” and “nutrient loading.”

### **2.1.2 Regional Data**

After ERG determined it had identified readily available national data, CSC requested an investigation of data available in the Great Lakes region. ERG applied similar search techniques described above for the national-level data search, with the addition of region-specific key words such as “Great Lakes.” Initial efforts revealed that much of the data applicable to the region was actually state-level data. Given this finding, CSC and ERG opted to not conduct other regional data searches and instead focused on states in diverse regions.

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<sup>3</sup> A prior ERG study revealed that most states rely on tourism data from DK Shifflet, Global Insights, or Tourism Economics.

### 2.1.3 Sample State Data

#### *Data Identification*

ERG applied the approaches it had developed when searching for national-level data to the state-level search as outlined below.

- **Recreational activity preferences and participation.** ERG performed an Internet search for surveys related to the ENOW industry categories. ERG reviewed organizations and agencies that might collect or provide this type of information, such as state-based trade associations for a particular ENOW tourism or recreation industry (e.g., searched “[state] hotel and lodging data” and “[state] marina data”).
- **State recreation surveys.** ERG performed an Internet search for state recreation surveys. ERG reviewed organizations and agencies that might collect/provide this type of information, including:
  - State agencies such as Departments of Natural Resources (DNRs),
  - Departments of Environmental Protection,
  - Fish and Wildlife Conservation Commissions,
  - Departments of Commerce, and
  - Other agency offices related to environmental or coastal work.
- **Travel data.** ERG began the search for travel data with websites for state boards of tourism, and the larger regional and county tourism websites.
- **Recreational expenditures such as transportation, accommodations, food services, and entertainment costs.** These data are largely captured by the above-mentioned *recreational activity preferences and participation* search.
- **Environmental impacts from recreational and tourism activities.** ERG:
  - Identified types of recreation impacts of interest and performed Internet searches on related key terms or a combination of key terms. Sample key terms include: state name, tourism, recreation, beach erosion, overfishing, recreational fishing, shell fishing, increase in nutrient pollution, destruction of sensitive areas; and
  - Identified and subsequently searched the websites of organizations, agencies, and universities working on coastal issues, including coastal research organizations, state departments of environmental protection/commissions of environmental quality, and state universities.

#### *Contacting Experts*

For each state or region in the study, CSC provided ERG with recommended experts. After performing initial data searches for an area, ERG provided the experts the results and requested recommendations for additional data resources and expert contacts. Table 1 contains a list of contacts

for each of the study states or regions.<sup>4</sup> These contacts rarely had other recommendations, indicating that ERG’s approach captured the desired data. In three cases, the contacts indicated forthcoming data efforts applicable to their state. The results were added to the inventory on an “In-Progress Studies” tab.

**Table 1: Contacts for Additional State Data**

State/Region	Contact/Affiliation
California	<ul style="list-style-type: none"> <li>• Phillip King, San Francisco State University</li> <li>• Linwood Pendleton, Duke University</li> <li>• Judith Kildow, National Ocean Economics Program</li> <li>• Astrid Scholz, Eco-Trust</li> <li>• Cheryl Chen, Eco-Trust</li> </ul>
Florida	<ul style="list-style-type: none"> <li>• Heidi Stiller, NOAA</li> <li>• Mickie Valente, Valente Advisers</li> <li>• Susan Goggin, Florida DEP</li> </ul>
Hawaii	<ul style="list-style-type: none"> <li>• Chris Hawkins, Affiliate Faculty, University of Hawai'i Sea Grant College Program</li> </ul>
Ohio	<ul style="list-style-type: none"> <li>• Heather Elmer, Coordinator, Ohio Coastal Training Program</li> <li>• Melinda Huntley, Ohio Sea Grant</li> </ul>
Massachusetts	<ul style="list-style-type: none"> <li>• Dave Loomis, Eastern Carolina University (formerly at University of Massachusetts)</li> <li>• Nick Napoli, Northeast Ocean Council</li> </ul>
Great Lakes Region	<ul style="list-style-type: none"> <li>• Jennifer Reed, MI Sea Grant</li> <li>• Rochelle Sturtevant, MI Sea Grant</li> </ul>
Multiple Areas	<ul style="list-style-type: none"> <li>• Michael Liffman and Chris Hayes, National Sea Grant</li> </ul>

## 2.2 INVENTORY TEMPLATE

ERG developed and revised the inventory template in conjunction with data collection efforts. The template was designed to capture the following information:

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<sup>4</sup> Contacts that were non-responsive have been excluded from the table.

- Name/type of data
- Type of collection (e.g., on-site survey)
- Responsible authority
- Frequency of collection
- Age of data available
- Geographic coverage of data
- Level of sub-regional scope
- Industry scope
- Sub-level industry scope
- Key assumptions in methodology
- Format
- Where to access it
- Cost

ERG created a new tab to capture literature results, which includes any relevant data fields. As data identification efforts progressed, additional data template tabs were added for each state and region. In addition to a forthcoming study tab, ERG also highlighted organizations that may serve as potential partners for the Agency related to data efforts.

### 3.0 RESULTS

This section discusses the coastal tourism, travel, and recreation data and literature found during the course of the project. Section 3.1 provides the national-level results, and Section 3.2 describes the state and regional findings. For both sections, a synthesis of findings is presented that includes the scope of available data, data limitations, and information gaps identified during the search process.

#### 3.1 NATIONAL LEVEL RESULTS

##### 3.1.1 Data

At the national level, some categories of travel, tourism, and recreation data were easily identified while other types of data were lacking. The types of national data identified range from large, federal datasets to national recreation surveys and travel and tourism data generated by private companies. Below, the national data search results are discussed by the type of data sought.

- **Recreational and tourism-related employment.** Several sources of employment data were identified at the national level, including data from the Bureau of Labor Statistics (BLS), U.S. Census Bureau, and NOAA ENOW data. While ENOW data can be linked entirely to tourism and recreation activities, BLS and Census data require manipulation in order to determine the portion of data that is attributable to tourism and recreation.<sup>5</sup>
- **Recreational activity preferences and participation.** There were a limited number of national surveys and reports that captured participation and preference information for recreational activities (e.g., Outdoor Industry Foundation Annual Recreation Participation

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<sup>5</sup> To do this, applicable industry data will need to be adjusted by a Tourism Commodity Ratio (TCR) for each NAICS code. A TCR is a sector-specific factor used to adjust the data for each measure to reflect the proportion of that sector that is consumed by tourists/visitors. For example, not all patrons at restaurants are visitors to an area, and a TCR adjusts the BLS or Census data for the restaurant sector to determine the percentage attributable to visitors.

Reports, Fish and Wildlife Service National Survey). The sources identified only covered select ENOW industries within the scope of this project (e.g., camping), and the relevant activities could not necessarily be associated with a coastal region.

- **Travel data.** National-level travel data primarily stems from the Bureau of Economic Analysis (BEA) and private companies that generate travel statistics for state and local governments. BEA publishes information such as production, supply, demand, and consumption of travel and tourism commodities, as well as output and value-added by industry and by commodity.<sup>6</sup> The statistics provided by private companies sometimes utilize BEA data in addition to conducting traveler surveys, and these data tend to include information such as travel and tourism spending, employment, and economic output for tourism and recreation-specific NAICS classes.
- **Recreational expenditures such as transportation, accommodations, food services, and entertainment costs.** While there were a few surveys identified that provided recreational expenditures (e.g., Fish and Wildlife Service National Survey), the majority of expenditure information was included in the data sources identified under travel data. BEA provides national estimates of these expenditures, while many of the private companies appear to provide these expenditures at the state and local level.
- **Environmental (physical and biological) impacts.** Although some data were identified that could be used to establish physical and biological impacts of coastal tourism and recreation (e.g., National Aquatic Resource Surveys: National Coastal Conditions Reports), actual estimates of these impacts were often presented in literature that discusses specific types of impacts occurring at a specific site. Very little information was available at the macro-scale.

### 3.1.2 National Data Information Gaps

During the data identification process, ERG found information gaps pertaining to 1) physical and biological impacts of coastal tourism and recreation, and 2) certain ENOW tourism and recreation industries and travel data.<sup>7</sup> Each of these limitations is discussed in more detail below.

#### *Physical and Biological Impacts of Coastal Tourism and Recreation*

National data associated with physical and biological impacts of tourism and recreation data do not provide information on explicit impacts; rather, they provide pieces of information that can be used as an indicator of potential impacts. For example, Table 2 shows the national-level data ERG identified for physical and biological impacts of coastal tourism and recreation. These data contain information on water quality, aquatic species, aquatic habitat, and beach renourishment. Databases containing environmental or ecosystem valuation studies were also identified. The data identified may be helpful in determining biological and physical impacts of coastal tourism when combined with additional data. For example, the Freshwater Biological Traits Database could be used in conjunction with recreational

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<sup>6</sup> Examples include accommodations, food and drinking places, and transportation (e.g., airline, taxi).

<sup>7</sup> The ability to separate coastal vs. non-coastal data is discussed under the next section, Data Limitations.

boating information to examine the impacts on a particular section of freshwater habitat in the Great Lakes region. However, as discussed later, causality is hard to determine.

**Table 2: National Data Sources for Physical and Biological Impacts**

Data Source Identified	Type of Data/Information Included
EMAP National Coastal Database	Water column data, sediment contaminants and toxicity data, and benthic macroinvertebrate and demersal fish community and contaminant data.
Freshwater Biological Traits Database	Database contains traits data for over 3,800 macroinvertebrates that could be used to help gauge biological impacts for freshwater coastal areas, such as the Great Lakes region. Data includes habitat, life history, mobility, morphology, and ecological trait data.
The U.S. Beach Nourishment Experience	Date, volume, length, and cost of beach nourishment projects along coastal United States.
Environmental Valuation Reference Inventory (EVRI)	Information base of studies that use a benefits transfer approach to valuing changes in environmental goods and human health.
ENVALUE (Australia-NZ)	Database of environmental valuation studies. Database can be searched by country as well as beach and recreation.
Nature Valuation (in process of combining with ESVD to form Ecosystem Services Partnership (ESP))	Database of literature that addresses valuation of ecosystem services.
Lincoln University Ecosystem Services Valuation Database	Bibliography of valuation studies.

While these data sources provide information that can be used in gauging impacts, they are not stand-alone sources for tourism and recreation impacts (See Section 3.1.3). However, as part of the literature review, ERG identified site-specific research on biological and physical impacts from tourism and recreation. We did not, however, uncover any information on a national or regional scale.

***Particular ENOW Tourism and Recreation Industries***

When searching for industry-specific information beyond general establishment, employee, and payroll information,<sup>8</sup> particular ENOW industry categories had more available data than others. (See Appendix A for the full list of ENOW tourism and recreation industries.) Table 3 shows the ENOW industry-specific data that were identified at the national level.<sup>9</sup> As the table indicates, the industry categories having the majority of identified data sources include: zoos and aquaria,<sup>10</sup> recreation vehicle parks and campsites, and scenic water tours.<sup>11</sup> Coastal tourism and recreation industry categories that had little or no coastal tourism and recreation data associated with them at the national level include:<sup>12</sup>

<sup>8</sup> Examples include the U.S. Census Bureau Quarterly Census of Employment and Wages, the U.S. Census Bureau County Business Patterns, and NOAA ENOW data.

<sup>9</sup> It was out of scope to assess data quality (i.e., one data source may be more useful than six mediocre ones).

<sup>10</sup> Zoos and aquaria include establishments that include aquarias, zoos, wildlife sanctuaries, and nature parks. The primary data sources identified under this industry category were attributable to National Parks.

<sup>11</sup> Scenic water tours include establishments such as excursion boat operation charter fishing boat services and harbor sightseeing tours that usually return to the place of origin in the same day.

<sup>12</sup> NAICS industry descriptions were taken from at <http://www.census.gov/>.

- **Boat dealers:** Establishments associated with the retail, repair, and service of boats and boat parts.
- **Restaurants and drinking places:** Establishments that prepare and serve food and beverages for on- and off-site consumption.
- **Hotels and lodging:** Hotels without casinos and bed and breakfast establishments.<sup>13</sup>
- **Sporting goods:** Establishments primarily involved in the manufacture of sporting goods and equipment, excluding footwear and apparel.
- **Amusement/recreation services:** These services cover a range of industries, including:
  - Sightseeing tours that do not occur on land and water, such as helicopter and hot air balloon rides;
  - Establishments such as schools and camps that provide athletic instruction, such as cheerleading camp and swimming instruction;
  - Establishments involved in equipment rentals such as bicycles and beach chairs; and
  - Establishments providing recreational services not elsewhere captured.

The limited identification of national-level data for these categories is largely attributable to: 1) the inability to distinguish coastal and non-coastal data within the above industry categories, and 2) the inability to link some industry data to tourism and recreation activities. Data available at the state and county levels were easier to link with coastal counties and activities.

### *Travel Data*

Private consulting companies collect a majority of the travel data (e.g., length of trip) through surveys. Although national level data can be purchased, ERG found that data is more readily available at the state level (i.e., state agency uses purchased data in its reports). See Section 3.2 for more information.

### **3.1.3 National Data Limitations**

The two main factors that contributed to limited national scale data for this study include:

- Aggregation of the data with coastal and non-coastal data difficult to parse out,
- Attributing data to tourism and recreation, and
- The multi-use nature of coastal areas (e.g., commercial fishing) and difficulty of pinpointing causality, particularly for physical impacts.

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<sup>13</sup> Restaurant and lodging data related to coastal tourism and recreation were more easily identified at the state or county level.

The limitation of coastal vs. non-coastal was most prevalent across recreation data sources. For example, the Outdoor Industry Foundation makes available national-level data regarding the participation of certain outdoor recreational activities (e.g., fishing, surfing, camping); however, those

Table 3: National Data Sources by ENOW Tourism and Recreation Industry

National Data Source Identified	Type of Tourism and Recreational Relevant Data/Information Included	ENOW Coastal Tourism and Recreation Industries								
		Boat Dealers	Eating and Drinking Places	Hotels and Lodging	Marinas	RV Parks and Camp-sites	Scenic Water Tours	Sporting Goods	Amusement and Recreation Services	Zoos, Aquaria
2011 Marina Trends Survey	Identifies current trends in U.S. marinas, both across the country and broken down by regions. Data include capital expenditures and renovations; employee numbers and wages; facility information such as number of slips, occupancy, and average size.				✓					
Fish and Wildlife Service National Survey	Number of anglers, wildlife watchers, and hunters and their participation; trips and days spent on various activities; expenditures by type of activity; demographic characteristics of participants.					✓	✓		✓	✓
National Park Service Money Generation Model	Estimation of economic impact that visitors to national parks have on local communities.									✓
NOAA Coastal Household Telephone Survey (CHTS)	Average number of recreational fishing trips per household, total trips by county, and statewide estimates.						✓			
NOAA Fisheries: Saltwater Recreational Data and Statistics	Searchable database of recreational saltwater fishing catch, effort, and participation data and statistics.						✓		✓	
Outdoor Industry Foundation Annual Recreation Participation Reports	Range of recreation participation statistics: demographic, economic, activity-based.					✓			✓	
PRORAGIS (Park and Recreation Operating Ratio and Geographic Information System)	Online database that collects, compiles, and reports park and recreation department operating and geographic information.					✓				✓
Recreation.gov	Online database of nature-based recreational areas commonly available on federally managed lands.					✓	✓			✓
The 2010 ARVC National Operations Survey Report	Identifies and tracks industry trends and benchmarks individual parks against industry norms.					✓				✓
The Recreational Boating Research Network	Online database of recreational boating studies and abstracts.						✓			
USDA National Visitor Use Monitoring Program	Reports on visitation and visitor characteristics, including: activity participation, demographics, visit duration, measures of satisfaction, and visit trip spending.			✓						✓
<b>Total Data Sources</b>		-	-	1	1	5	5	-	2	6

statistics are aggregated with no link to coastal/non-coastal geographies.<sup>14</sup> It was also difficult to link some data directly to coastal tourism and recreation activities. For example, BLS establishment and employment data need to be adjusted by a tourism commodity ratio in order for the data to reflect the tourism and recreation activities, spending, and other impacts (see Section 3.1.3). Lastly, with some coastal areas having overlapping tourism and recreational uses, data that might be used to help determine biological or physical impacts (e.g., water quality data) may be difficult to associate with particular activities or uses. Combining these data sources that encompass several types of activities with impact- or activity-specific reports or literature may help offset this data limitation.

### 3.1.1 Literature

Literature searches conducted under this study were primarily intended to fill data gaps that emerged during the search for national datasets (see Section 3.1.2 above). ERG found that the majority of the studies that discussed coastal recreation and tourism addressed a specific type of impact in a localized study area. National-level literature that was captured in the inventory includes studies such as the EPA's Report on the Environment, a national marina trends study, Mid-Atlantic shoreline analysis, and a review of literature pertaining to the impact of transportation generated from coastal tourism.

## 3.2 STATE AND REGIONAL RESULTS

This section provides the results from the search for state and regional data. The section begins with a general summary of data findings and limitations before delving into specific states and regions that were the focus of the sub-national data searches (Section 3.2.2). A discussion of state and regional data gaps is then presented (Section 3.2.3), followed by a section on data limitations (Section 3.2.4)

### 3.2.1 State and Regional Data Overview

At the state and regional level, the primary available types of data and literature fall into the following categories:<sup>15</sup>

- Travel and tourism data (e.g., visitor statistics and expenditures),
- Recreational data (e.g., park and boating surveys),
- Beach/coastal data (e.g., beach use and erosion),
- Recreation valuation studies (e.g., snorkeling and saltwater activities), and
- Recreational impact studies (e.g., loss of habitat, erosion).

The available types, quantities, and depth of data and literature associated with these categories of information varied between states and regions. ERG was able to find travel data for each

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<sup>14</sup> The Outdoor Foundation's Outdoor Recreation Participation Report can be accessed at: <http://www.outdoorfoundation.org/research.participation.2010.html>.

<sup>15</sup> Since tourism and recreational employment and establishment information that could be broken down by state and county was readily available through national data sources, this category of data was not a focus of the state and regional data searches.

of the sample states reviewed (see Table 4). Similar to the national-level data, recreational impact data were also found primarily through a review of literature, with impacts relating to beach erosion and habitat loss being identified most frequently. Most states had some type of data on recreational activities and preferences; however, these data were often limited to several types of recreation and did not cover each of the industry sectors (see Section 3.2.3). Lastly, the search for regional data revealed that while some regional datasets are available (e.g., environmental data collected by regional organizations), many of the types of coastal and recreational data sought (e.g., travel and visitor data) are more readily available at the state-level.

Table 4 shows the types of data made available for the study states/region. Data for biological and physical impacts are not included in the table and are discussed further in sections 3.2.2 and 3.2.3.

**Table 4: Type of Data Available by State and Region**

State	Travel Data	Recreational Activities and Preferences [a]	Recreational Expenditures
California	✓	✓	✓ [b]
Florida	✓	✓	✓ [c]
Great Lakes		✓	
Hawaii	✓	✓	✓ [d]
Massachusetts	✓	✓	
North Carolina	✓	✓	✓ [e]
Ohio	✓	✓	✓ [f]

[a] See Table 6 for the types of data by state.

[b] State park visitor expenditures.

[c] Expenditures for boating; hunters, anglers, and wildlife viewers; and reef-related recreation.

[d] Expenditures for boating, camping, and fishing.

[e] Expenditures for state park visitors.

[f] Expenditures for recreational boating.

Further detail and examples of these overarching findings are presented in the discussion of site-specific results and data gaps presented below.

### **3.2.2 Site-Specific Results**

#### **California**

The coastal tourism and recreation information identified for California largely mirrored information available at the national level. For example, by looking at the state’s tourism web pages, information such as employment numbers and economic impacts was made available at the county level. Information on particular industries and recreation participation was slightly more difficult to identify. Data were more readily available for categories of information (e.g., recreational preferences) and specific ENOW industries (e.g., RVs and camping) that could be associated with a state agency (e.g., State of California Natural Resources Agency and the Statewide Planning Unit Planning Division California State Parks, respectively). Some state trade associations also made relevant data available (e.g., California Lodging Industry Association).

Similar to the national-level data, physical and biological impacts were specific to studies identified through a review of literature. A search for relevant literature revealed a range of studies pertaining to beach attendance, erosion, and coastal change. Due to our decision to include articles less than five years old in the inventory, much of the research was excluded.

### ***Florida***

The coastal tourism and recreation information identified for Florida was similar to the findings for California. Using the same parameters as the national level search, ERG found data provided by the Florida Department of Environmental Protection, the Florida Fish and Wildlife Conservation Commission, the Florida Office of Economic and Demographic Research, and the VISIT FLORIDA Research Organization. Travel statistics, a few recreational surveys (e.g., fishing, hunting, and wildlife; outdoor recreation), tax revenue data, and data concerning coastal issues and beach erosion comprised the majority of data identified.

Most physical and biological impacts were beach-specific and were found through a review of literature. Most literature studies for Florida focused on beach and coastal erosion; however, there were also some studies relating to the willingness to pay to snorkel as well as the valuation of beach recreation.

### ***Great Lakes Region***

The search for regional data pertaining to the Great Lakes resulted in the identification of a minimal amount of information. Search terms used at the national and state levels resulted in less data and information (e.g., state travel statistics) because there are only a handful of regional organizations that track relevant data (e.g., the Great Lakes Commission), with other types more easily accessed at the state level (e.g., travel statistics). Data that were identified include: historical and real time data about the lake's physical conditions from the Great Lakes Observing System Explorer; water quality, sediment chemistry, and fish sampling information from the EPA's Great Lakes Environmental Database; and a range of historic and real-time lake data (e.g., physical, biological, chemical) from the Great Lakes Environmental Research Laboratory Data.

Given the minimal amount of regional data identified through the search, ERG conducted a search for applicable data in Illinois and Michigan in order to illustrate the availability of state-level information. The state-level search revealed studies that addressed particular aspects of the Great Lakes coast and its recreational activities, such as a paper on the coastal erosion along the Illinois coastal zone and a Michigan charter fishing study.

### ***Ohio***

ERG also looked more in-depth at Ohio, which is part of the Great Lakes region. Its coastal tourism and recreation data were focused on Lake Erie. The search for applicable data revealed minimal relevant data sources, with the primary types of data centered on visitor statistics, recreational activities, and participation. In terms of visitor data, the Ohio Office of Tourism provides a tourism economic impact study as well as a range of visitor statistics. Recreational data include a statewide outdoor recreation plan, surveys for recreation boating and birding along the Great Lakes, and research and sampling data for Lake Erie fisheries.

### ***Hawaii***

ERG found a range of data and literature that addresses each of the categories of data sought under this project. For example, Hawaii's Department of Business, Economic Development & Tourism provides a state data book, with a section of data dedicated to tourism and recreation, and extensive travel data and related expenditures. The state has also conducted an inter-county input-output study that estimates tourism impacts at the local level. In terms of recreational activities and preferences, there are surveys that gauge the economic importance of recreational fishing and state park visitation as well as boating and recreation receipts made available by the Department of Land and Natural Resources.

Similar to the other state and national searches, recreational impacts in Hawaii were primarily identified through literature. The literature identified includes studies addressing tourism use of coral reefs, trampling of coral, and a state natural resources assessment that highlights issues such as resource degradation. Other literature emerging from the data search also addresses sustainable tourism in Hawaii as well as the economic impact of the state's museums and cultural attractions to the tourism economy.

### ***Massachusetts***

Limited data were identified for Massachusetts. Similar to other states, the primary category of relevant data available for Massachusetts was travel data. The Massachusetts Office of Travel and Tourism (MOTT) provides a range of travel and tourism statistics such as a tourism economic impact report, hotel room occupancy tax collections, and a range of visitor attendance and economic impact information in the TravelStats Newsletter and annual report. In terms of recreational data, the search identified the state's comprehensive outdoor plan, which includes survey data on the demands of certain recreational assets as well as a survey on recreational boating. Lastly, an assessment of marine and coastal economies in Massachusetts was identified that provides an overview of related employment, wages, business activities, and industry trends.

### ***North Carolina***

The primary type of data identified falls under the project data categories of travel data and recreation expenditures. The North Carolina Department of Commerce's Division of Tourism, Film and Sports Development provides a range of tourism-related information such as visitor statistics, tax revenues associated with tourism, lodging reports, and tourism impact studies. A more modest level of state recreational data was identified, with a report of the economic contribution of state park visitors, a survey of recreational saltwater activities, and statistics associated with visitor sites on the Outer Banks comprising the recreation-related findings.

### **3.2.3 State and Regional Data Gaps**

At the state and regional levels, there were two primary categories of data gaps, including: 1) datasets for environmental impacts resulting from coastal tourism and recreation, and 2) data on certain types of recreational activity preferences and participation. Below, each of these data gaps is described further.

*Environmental Impacts of Coastal Tourism and Recreation*

Similar to the national-level findings, state and regional datasets<sup>16</sup> associated with physical and biological impacts of coastal tourism and recreation were largely unavailable. Aside from datasets identified for the Great Lakes, ERG identified most data by performing literature searches (see Table 5). Erosion and/or shoreline change was the most frequently addressed impact. Although the state- and regional-level search generated more impact-oriented data than at the national level, the bulk of studies identified were at sub-state, study-specific locations.

**Table 5: Data Sources for Biological and Physical Coastal Recreation and Tourism Impacts by State and Region**

State	Data Sources	Data from Literature Source	Data from Electronic Database [a]
California	Economic and social impact of a changing coastline in California	✓	
	Loss of coastal strand habitat in Southern California: the role of beach grooming	✓	
	California Beach Erosion Assessment Survey 2010	✓	
Florida	Beach Erosion Control Project Monitoring Database Information System		✓
	Florida Assessment of Coastal Trends	✓	✓
	Critically Eroded Beaches in Florida	✓	
Great Lakes	Great Lakes Observing System Explorer		✓
	Great Lakes Environmental Database		✓
	Great Lakes Environmental Research Laboratory Data		✓
Hawaii	Waikiki Beach, Oahu, Hawaii: History of its transformation from a natural to an urban shore	✓	
	The Predictive Accuracy of Shoreline Change Rate Methods and Alongshore Beach Variation on Maui, Hawaii	✓	
	Ecological Economic Modeling of Coral Reefs: Evaluating Tourist Overuse at Hanauma Bay and Algae Blooms at the Kihei Coast, Hawai'i	✓	
	HI Natural Resource Assessment (volumes I and II)	✓	
	The effects of trampling on Hawaiian corals along a gradient of human use	✓	
	Beyond fisheries enhancement: artificial reefs and ecotourism	✓	
Massachusetts	None Identified		
North Carolina	None Identified		
Ohio	None Identified		

[a] Data is available in a downloadable format.

*Recreational Activity Preferences and Participation Data*

While most states had at least one study or survey that provided information on recreational preferences and participation, the quantity and type of data varied across locations as shown in Table 6.

<sup>16</sup> Datasets refers to a non-literature based source of data, such as an Excel spreadsheet, Access database, or online database that has data available in a downloadable electronic format for easy manipulation.

Data identified for each state and region touched on different activities, with recreational boating, fishing, and camping the most frequently addressed. Data ranged from general recreational statistics and preferences provided in state outdoor recreational plans to surveys of recreational fishing and state park visitation.

**Table 6: Sources of Recreational Activity Preference and Participation Data by State and Region<sup>17</sup>**

State	Recreational Activity Preferences and Participation Data Sources
California	<ul style="list-style-type: none"> <li>• California RV Parks and Campgrounds (CalARVC) Occupancy Statistics</li> <li>• California State Park System Statistical Report 2010/11 Fiscal Year</li> <li>• Survey on Public Opinions and Attitudes on Outdoor Recreation in California 2009</li> </ul>
Florida	<ul style="list-style-type: none"> <li>• Outdoor Recreation in Florida: Survey for the State Comprehensive Outdoor Recreation Plan (SCORP)</li> <li>• Florida Outdoor Recreation Inventory (FORI)</li> </ul>
Great Lakes	<ul style="list-style-type: none"> <li>• Great Lakes Recreational Boating's Economic Punch</li> <li>• Michigan Charter Fishing Study</li> </ul>
Hawaii	<ul style="list-style-type: none"> <li>• State of Hawaii Data Book (Section 7: Recreation and travel)</li> <li>• Visitor Satisfaction and Activity</li> <li>• Hawaii State Parks Survey</li> <li>• Hawaii National Parks "By the numbers"</li> <li>• Hawaii State Comprehensive Outdoor Recreation Plan</li> <li>• The Economic Impact of Hawaii Museums and Cultural Attractions in a Tourism Economy</li> <li>• The Economic Importance of Recreational Boat Fishing in Hawaii</li> <li>• The Economic Importance of Recreational Shore Fishing in Hawaii</li> </ul>
Massachusetts	<ul style="list-style-type: none"> <li>• Massachusetts Outdoor 2006 Statewide Comprehensive Outdoor Plan</li> <li>• 2010 Massachusetts Recreational Boater Survey</li> </ul>
North Carolina	<ul style="list-style-type: none"> <li>• North Carolina Travel Tracker</li> <li>• Outer Banks Visitation Numbers</li> <li>• Outer Banks Visitor Study</li> <li>• North Carolina Recreational Saltwater Activity Mail Surveys</li> </ul>
Ohio	<ul style="list-style-type: none"> <li>• Recreational Boating in Ohio: an Economic Impact Study</li> <li>• Socio-economic Impacts of Birdwatching along Lake Erie</li> <li>• Ohio's Lake Erie Fisheries 2007</li> <li>• Ohio Statewide Outdoor Recreation Plan</li> </ul>

**3.2.4 State and Regional Data Limitations**

The primary data limitation regarding state and regional data was the format in which the data/information was provided. The majority of data was provided through literature or in pdf formatting rather than electronic datasets or formats that can be downloaded for analysis (e.g., Microsoft Access or Excel). Recreational data, such as survey data, were also made primarily available through literature-based reports, as was travel and visitor data (with the exception of the state of Hawaii). ERG did not follow up with organizations to better understand the availability of data in more readily accessible formats for analysis, but anticipates with additional effort that much of the data is likely available.

<sup>17</sup> More details about these sources are available in data inventory produced for this project.

### 4.0 CONCLUSION

Although tourism and recreation-related development are major factors shaping the use and management of U.S. ocean and coastal resources, there historically has been limited systematic collection on the magnitude, value, and impacts of coastal tourism and recreation, which is required for sound planning and sustainable management. To better understand available data at a national level, and for six states (CA, FL, HI, MA, OH, and NC), ERG developed an inventory of coastal tourism and recreation data pertaining to:

- Recreational and tourism-related employment;
- Recreational activity preferences and participation;
- Travel data;
- Recreational expenditures such as transportation, accommodations, food services, and entertainment costs; and
- Environmental impacts.

The results of the data search (Tourism Data Inventory\_March 2013.xlsx) indicate that the scope of currently available data varies among national, state, and regional sources. At the national level, employment information and some national recreational surveys and statistics are the primary data sources available. While related private company reports are available at the national level, the majority of the travel and expenditure information is provided at the state level.

Studies associated with environmental impacts of coastal tourism and recreational activities are also predominantly site specific. These studies often assess particular types of physical or biological impacts of coastal recreation and are most easily identified through peer-reviewed literature. While erosion was the most frequently addressed impact across state literature searches, the type(s) of impacts addressed among relevant studies identified were not consistent across locations.

Although initially part of the scope, ERG did not pursue regional-level data beyond the Great Lakes, since a majority of the information was parsed at the state level. The regional-level data found were more directed to scientific monitoring of coastal resources with the addition of some recreational information. Given this, ERG devoted time to state-based searches to supplement the minimal amount of regional data available.

Throughout the data collection process, ERG encountered a number of overarching challenges in identifying data, including:

- **Data availability.** Each type of coastal tourism and recreation data sought was not available at all geographic levels (i.e., the national, state, and regional levels). For example, establishment and employment data are readily available through national datasets, travel data and tourism-related expenditures are more prevalent at the state level, and data used to estimate physical/biological impacts are often available through site-specific studies that address a particular type of impact rather than at a macro-level.

- **Data consistency.** The types of travel, tourism, and recreation data collected vary between national, state, and local levels. Even among similar geographical scales and similar data categories (e.g., travel statistics), the type of data collected is not consistent. For example, one state may provide an aggregate number of state visitors for a given year while another state may provide visitor information that can be associated with particular tourist activities (e.g., beach visitors) or with a particular county. The types of state data provided in the latter example make it easier to link visitors, activities, and expenditures with the coast. Additionally, within individual data sets, the collection of the data may vary from year-to-year, making it harder to make meaningful conclusions.
- **Overlapping costs.** Tourism-related expenditures often overlap with local spending, making it difficult to parse out and attribute costs to tourism-related activities and visitors in a manner that is consistent and accurate. For example, both types of consumers spend money at restaurants. However, tourism commodity ratios can be used to help identify the relevant portions.
- **Data formats.** Many of the pieces of applicable data identified, particularly at the state level, were in formats such as pdf documents and journal articles that do not lend themselves to easily extracting the pertinent information or performing analyses.

### 5.0 FUTURE CONSIDERATIONS

Based on the findings of this search to identify coastal tourism and recreation data, future considerations might include:

- **Gathering additional data on physical/biological impacts.** Peer-reviewed literature contains many articles about sustainable tourism and the development of meaningful measures. NOAA could generate a list of impacts of greatest interest and develop an annotated bibliography and review results of these studies to better understand potential research priorities.
- **Building research and data through partnerships.** Fostering current partnerships and developing new partnerships could cultivate research and data collection efforts to help address data gaps and to leverage methodology to other areas.
- **Identifying and implementing ways to share national and state data via NOAA's websites.** NOAA could use the state- and national-level data collected from this project to expand information provided in NOAA's Digital Coast website and to communicate researchers' results. Additionally, NOAA itself funds a significant amount of research and data collection (e.g., Sea Grant<sup>18</sup>) so working with the Digital Coast Partnership to identify ways to disseminate additional relevant information and implement steps to ensure the integrity of the data post is valuable.

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<sup>18</sup> For more information, see "[Sustainable Coastal Tourism: Renewing Sea Grant's Role](#)," May 2012.

**APPENDIX A: ENOW TOURISM AND RECREATION INDUSTRIES**

**Table A-1: Industries in the ENOW Tourism and Recreation**

<b>Industry</b>	<b>NAICS Code</b>	<b>NAICS Industry (1997 NAICS)</b>
Boat Dealers	441222	Boat Dealers
Eating and Drinking Places	722110	Full Service Restaurants
	722211	Limited Service Eating Places
	722212	Cafeterias
	722213	Snack and Nonalcoholic Beverage Bars
Hotels and Lodging	721110	Hotels (except Casino Hotels) and Motels
	721191	Bed and Breakfast Inns
Marinas	713930	Marinas
Recreational Vehicle Parks and Campsites	721211	RV Parks and Recreational Camps
Scenic Water Tours	487210	Scenic and Sightseeing Transportation, Water
Sporting Goods	339920	Sporting and Athletic Goods Manufacturing
Amusement and Recreation Services	487990	Scenic and Sightseeing Transportation, Other
	611620	Sports and Recreation Instruction
	532292	Recreation Goods Rental
	713990	Amusement and Recreation Services Not Elsewhere Classified
	712130	Zoo and Botanical Gardens
Zoos, Aquaria	712190	Nature Parks and Other Similar Institutions

Source: NOAA Coastal Services Center, 2012 at [http://www.csc.noaa.gov/digitalcoast/\\_pdf/ENOW\\_FAQs.pdf](http://www.csc.noaa.gov/digitalcoast/_pdf/ENOW_FAQs.pdf)