

**Rhode Island Economic Monitoring Collaborative**

**Report to the**

**Rhode Island Bays, Rivers, and Watersheds Team**

*The Development of an Economic Monitoring Strategy*

**January 2005**

**Executive Summary:** This report describes actions taken by the Economic Monitoring Collaborative as it works towards the development and implementation an economic monitoring program based on the charges of R.I.G.L. Chapter 46-31. Furthermore, it will describe the process the Collaborative has undertaken in order to map the state's capabilities in water-dependent industries, which will serve to inform the Coordination Team in its preparation of the systems-level plan.

## **Introduction**

Rhode Island's General Assembly created the Rhode Island Bays, Rivers, and Watershed Coordination Team with the expressed purpose of coordinating the "the promotion of sustainable economic development of businesses that rely on the bays, rivers, and watersheds."<sup>1</sup> The legislation further called for the creation of the Economic Monitoring Collaborative in order to aid the Coordination Team in the achievement of this goal. Specifically, the Legislature charged the Collaborative with the development of a monitoring strategy for Rhode Island's "water cluster", including "baselines, protocols, guidelines, and quantifiable indicators for assessing (their) economic health and performance."<sup>2</sup>

This report serves as the strategy for meeting the aims of the Collaborative's monitoring role. In addition, it will cover the Collaborative's other activities which have the potential to inform the development of a systems-level plan.

It must be noted that since the Collaborative has not been officially appointed, with only the Rhode Island Economic Policy Council and the University of Rhode Island's Natural Resource Economics department named in the legislation, all activities to date have been on an ad hoc basis. Until the Collaborative has an official membership, it may prove challenging to address some elements of the monitoring strategy.

## **Monitoring Strategy**

The Collaborative initially focused its attention on determining the availability and quality of data available for industries in the "water cluster". Industries identified included boatbuilding, boat servicing and related activities; commercial fisheries and aquaculture; marine events; marine transportation; military activities; recreation/tourism; research, development and education; and shipbuilding.

In December of 2004, the Rhode Island Economic Policy Council hosted a presentation of the two recent, key research efforts to document these industries.<sup>3</sup> Dr. Kenneth Payne, Senior Policy Advisor of the RI State Senate Policy Office, presented his office's report, "*The Marine Cluster: An Investment Agenda for Rhode Island's Marine Related Economy*", which identified key marine clusters in the state and recommended key investments for their promotion and success. Dr. Charles Colgan, Professor at the University of Southern Maine, presented findings data on the state's "ocean industries" as defined in Colgan's National Ocean Economics Program, which he is directing under the auspices of the National Oceanic and Atmospheric Administration.

These two research efforts are complementary. The Senate study provides a baseline of qualitative data on the strengths, weaknesses, opportunities and threats facing each of the state's maritime sectors. Colgan's research provides quantitative data on the size of the marine related sector in Rhode Island. Both research efforts have gaps. The Senate research focused on the marine sectors individually, without in-depth consideration of potential

---

<sup>1</sup> R.I.G.L. Chapter 46-31, Section 46-31-1 Legislative Findings.

<sup>2</sup> R.I.G.L. Chapter 46-31, Section 46-31-9 Committees.

<sup>3</sup> The presentation slides can be viewed at <http://www.ci.uri.edu/RIBayTeam/EconMon.htm>.

synergy among the marine sectors. The Colgan data aggregates ship building and boat building, and is missing data for fish harvesting and for the government portion (e.g., the Naval Undersea Warfare Center and the Naval War College) of the defense sector. Current Collaborative members are hopeful that the appointment of a diverse membership to the body will help identify ways to get at this missing data.

To complement these two primary data sources, the staff of the Policy Council has also prepared an annotated bibliography of recent research on marine-related industries (see appendix).

The Collaborative plans to provide a strategic monitoring report of the state's water clusters based on the Senate and Colgan research. This snapshot will clearly identify shortcomings in the data and strategies for collecting missing data. The completion of this project will be subject to the official appointment of the full Collaborative membership.

### **Capability Mapping**

For the Collaborative to develop the best possible monitoring strategy and to provide effective recommendations to the Coordination Team for the systems-level plan, it was necessary for the committee to undertake a strategic planning process. This exercise is creating a deeper understanding of the composition and complexity of the state's "water-related" industries and will ultimately lead to a better sense of what strategies the Coordination Team will need to adopt to achieve sustainable economic development in these sectors.

The Policy Council has contracted with Larry Quick & Associates, a strategy and research organization based in Australia. Larry Quick is leading an ad hoc group through a strategic process for mapping capabilities and networks within the water-related industries. The fundamental purposes of this process are to 1) understand the immediate and emergent conditions which enable/constrain Rhode Island's water-related sectors; 2) "un-bundle" capabilities from institutions, revealing possible new combinations of capabilities that create value for key constituents; and 3) identify a set of targeted interventions that will exploit the opportunities identified. It is anticipated that the resulting project list will include many of the investments proposed by the Senate study as well as projects proposed by the economic development panel of the Governor's Bay Commission. In addition to the Policy Council and URI Resource Economics, representatives from industry, government and higher education/research are participating in this process. This exercise will be completed by mid-February and its results will be incorporated into the report noted above under the monitoring strategy.

### **Next Steps**

Once the Collaborative has an official membership, it will begin to compile the strategic monitoring report. This report will serve as the baseline document for further monitoring and evaluation and will provide recommendations on the coordination of the state's activities as they relate to these industries.

## **Recommendations**

The Collaborative recommends that the Coordination Team consider undertaking a similar strategic planning process as the one discussed above in order to optimize its effectiveness as an interagency team and enhance its ability to achieve the charges of the legislation. The Team may also want to consider the use of a systems-dynamics exercise, which would help focus team members on successful coordination and resource allocation. The Policy Council is willing to initiate these activities for the Coordination Team.

## APPENDIX

### **Annotated Bibliography: Economic Studies and Related Publications on Narragansett Bay and/or Rhode Island Marine-related Industries**

**American Oceans Campaign. 1996. *Estuaries on the Edge: The Vital Link Between Land and Sea; Chapter Six: Narragansett Bay in Rhode Island*. Online at <http://www.americanoceans.org/estuary/edge.htm>.**

Part of a larger survey of 28 estuaries across the nation, this chapter summarizes findings from a variety of studies and articles on the economic value of Narragansett Bay including estimates for recreation/tourism and fisheries/seafood (estimates are for the early 1990's). The chapter also discusses threats to the Bay and the creation of the Narragansett Bay Project to address these concerns.

**Carey, D., Grigulanas, T., Marti, B., Popko, P., Webster, W.R., Torgan, J., Whitehouse, S., Twichell, H., and R. Anderson. 2000. *Commercial Marine Transportation on Narragansett Bay: Status, Trends and Issues*, Narragansett Bay Summit 2000, White Paper, Working Draft. Available online at <http://www.nbep.org/summit/wpapers.html>.**

This report, prepared for the 2000 Narragansett Bay Summit, reviews marine commercial transportation in Rhode Island. The authors describe the system's infrastructure, the types of marine traffic, the sector's economic impacts, and an analysis of maintenance to the infrastructure (i.e. dredging).

The authors state that in 1995, 716 individuals were employed in water transportation and earned \$18.66 million in compensation. The sector had output valued at \$131.83 million and value added of \$26.72 million (including marinas). In addition, the authors estimate that cruise ship passengers contributed \$2.5 million to the local economy from 1992 to 2000. While some of the data cited in the report comes from the Army Corps of Engineers, the sources of the estimates above are not clear from the report.

**Coastal Resource Center/RI Sea Grant. 2004. *Economic Assets Chapter, in Greenwich Bay SAMP*. Prepared for the RI Coastal Resources Management Commission. Draft. Available online at [http://seagrant.gso.uri.edu/G\\_Bay/Management/SAMP/draft.html](http://seagrant.gso.uri.edu/G_Bay/Management/SAMP/draft.html).**

This chapter introduces the economic assets and challenges in the Greenwich Bay SAMP area, specifically around marine-related tourism, boating-related business, and fisheries and aquaculture. It references key state economic policies linking to the Bay, presents findings on the status of these sectors (in terms of employment and other key indicators) pulling from state, federal and other research studies. The report also recommends actions in order to increase shellfish/fishery resources, enhance access to the Bay, create an integrated tourism strategy, and promote marina viability.

**Colgan, C.S. and H. Kite-Powell. 2001. *The Ocean Economy of Rhode Island*. Prepared for the Rhode Island House Policy Office.**

This study examines RI's "ocean economy" in the 1990s, defining economic sectors based on the National Ocean Economics Project framework, which considers sectors that require ocean resources as an input (<http://essp.csUMB.edu/noep/>). This framework examines the following sectors: Living Resources, Construction and Rehabilitation, Tourism and Recreation, Minerals, Transportation, and Government. The study reports the impacts of these sectors by examining gross product output (GPO), employment and wages, using ES202 data from Rhode Island's Department of Labor and Training.

Data limitations occur in both the Living Resources category (particularly the harvesting sector) and in the government sector (which only captures private industry contracting with government as opposed to government entities such as NUWC). In addition, several other sources of over and underestimation are detailed in the report.

In 1997, the ocean economy accounted for 1.9% of the state's GPO, 1.7% of employment, and 2% of wages. The 1990 employment measures indicate that the state's marine economy contracted by 23%. However, most of this loss occurred in the government sector while others grew or remained stable. It is important to note that the estimating methods used in this report differ somewhat from the current estimates for RI from the Ocean Economics Project (presented to the Economic Monitoring Collaborative in November 2004). Specifically, the whole state is included in this analysis there are differences in the sector composition.

**Colgan, C.S. 2004. *The Rhode Island Ocean Cluster?* Presentation to the Rhode Island Economic Monitoring Collaborative (November 19, 2004). Available online at <http://www.ci.uri.edu/RIBayTeam/EconMon.htm>.**

This presentation highlighted the characteristics and trends of Rhode Island's ocean economy as defined by the National Ocean Economics Project (<http://essp.csUMB.edu/noep/>). This framework, which has been adjusted since Colgan and Kite-Powell (2001), includes the following sectors: Construction, Living Resources, Minerals, Ship and Boat Building, Tourism and Recreation, and Transportation. The framework will ultimately include Scientific Research and Government sectors; however, this data has not yet been analyzed.

Using ES202 data, the presenter discussed the ocean economy as a percentage of state's total employment and gross state product (GSP) and described the composition of the state's ocean economy versus the U.S. He also discussed changes in employment, wages, and GSP from 1990 to 2000. According to this research, the state's ocean economy accounted for 3.7% of GSP and 8% of employment in 2000. Data limitations include the inability to disaggregate ship and boat building, the lack of sufficient fish harvesting data, and the lack of government-based defense sector data.

In addition, the presenter discussed a cluster analysis technique, which is detailed in *A Framework For Assessing Cluster Development* (C.S. Colgan, November 2003, Economic Development Quarterly).

**Colt, A.B. Tyrell, T., and V. Lee. 2000. *Marine Recreation and Tourism in Narragansett Bay: Critical Values and Concerns*, Narragansett Bay Summit 2000, White Paper, Working Draft. Available online at <http://www.nbep.org/summit/wpapers.html>.**

This report, prepared for the 2000 Narragansett Bay Summit, addresses the economic impact of the state's marine recreation and tourism industries, with a focus on recreational boating and fishing, beaches/coastal parks, and recreational diving. The report pulls from recent studies on the overall impact of the tourism industry, which cite growth in the travel and tourism industry and the additional value derived from consumer surplus estimates of the Bay's value. The report also identifies key socioeconomic and environmental trends that could impact the state's marine resources and identifies strategies for sustainable management of the Bay.

**DeAlteris, J., Gibson M., and L.G. Skrobe. 2000. *Fisheries of Rhode Island*, Narragansett Bay Summit 2000, White Paper, Working Draft. Available online at <http://www.nbep.org/summit/wpapers.html>.**

This report discusses both commercial and recreational fisheries in Rhode Island, providing background on their history, status, trends, economic impact, and key management issues. The report values commercial fisheries' landings at approximately \$10 million (in 1999) and the total value of the state's seafood industry at over \$700 million (based on 1996 fishery statistics). The report's estimates rely on the methodology of previous studies such as Tyrell et al. (1994) and the RI Seafood Council (1998). The report estimates the economic impact of marine recreational fishing at approximately \$150 million (in 1999). This estimate is based on the methodology used by Tyrell and Harrison (2000). In addition to its estimates, the report highlights key economic studies of the fisheries over the past decade.

**Friday, R., Fitzgerald, K., and K. Woodward. 2001. *Chapter: Economy. In Aquidneck Island Today: Summary Data on Existing Conditions*. M. Kerr, V. Lee, and S. Kennedy eds. Rhode Island Sea Grant/URI Coastal Resources Center. Available online at <http://seagrants.gso.uri.edu/bookstore/>.**

This chapter summarizes the current economy of Aquidneck Island, in terms of employment, commuting patterns, seasonal effects, educational status, and revenue streams. Data sources include RI Department of Labor and Training, 1990 U.S. Census, and various state and federal reports. It was prepared in order to assist Aquidneck Island's communities with regional planning efforts.

**Governor's Narragansett Bay and Watershed Planning Commission. 2004. Economic Development Pane Report. Prepared as part of the Phase 1 Report prepared for Governor Donald Carcieri. Available online at <http://www.ci.uri.edu/govcomm/Documents/Phase1Rpt/default.htm>.**

This report identifies four primary charges to promote sustainable economic development of Narragansett Bay, which are the revitalization of coastal communities and underutilized parcels, the development of a Marine Bio-Sciences Research Park, and the creation of plans to increase marine trades activity and marine tourism activity in the state. In the Governor's response to this report (July 2004), he called for RIEDC to coordinate with coastal communities and other private and public entities to develop strategies for these charges.

**Harrington, M. 2000. The Impact of Narragansett Bay on Rhode Island's Industrial Development. Prepared as part of the Phase 1 Report prepared for Governor Donald Carcieri. Available online at <http://www.ci.uri.edu/govcomm/Documents/Phase1Rpt/default.htm>.**

This report, prepared for the 2000 Narragansett Bay Summit, analyzes the Bay's impact on Rhode Island's economy, discusses the negative impacts of this growth on the Bay, and recommends actions to mitigate these negative impacts. In addition to providing a brief history of Bay-centered economic activity, the author provides some detail on the more recent economic impacts of current sectors reliant on this marine connection. Using a variety of sources (primarily state and federal annual reports), the author estimates impacts of military uses, fishing, tourism, industry and commerce, boat/ship construction and repair, fishing related industries, port services/maritime transportation.

**Hicks, R., S. Steinback, A. Gautam, and E. Thunberg. 1999. *Volume II: The Economic Value of New England and Mid-Atlantic Sportfishing in 1994*. NOAA Tech Memo No. NMFS-F/SPO-38. Available online at <http://www.st.nmfs.gov/st1/econ/pubs.html>.**

This study uses the findings from the 1994 Marine Recreational Fisheries Statistics Survey (NMFS) to anglers in the Northeast United States to estimate the value of access to fisheries and the marginal value of catching fish. The researches use a nested random utility model (RUM), which links economic choices of anglers to the expected catch rate of a fishery. The study finds that recreational fishing is a valuable resource in the Northeast.

**Hinga, K., Collins, B.A., and S. Hickox. 2000. Research, Technology Development, an Education on Narragansett Bay. Narragansett Bay Summit 2000, White Paper, Working Draft. Available online at <http://www.nbep.org/summit/wpapers.html>.**

This report, prepared for the 2000 Narragansett Bay Summit, describes the status of the state's research, technology development and education opportunities that center on the Bay and marine-related sectors. In addition to author research, the report relies on the findings of a survey mailed to state and federal entities and two hundred private firms known to be involved in marine-related activities.

The authors estimated that research activities on the Bay totaled approximately \$85 million (based on 2000 survey results), in addition to private sector investment in these activities. Though the private sector R&D was not quantified in the report, the authors estimated that around 200 firms engage in research, technology development and education related to the Bay.

**The Louis Berger Group, Inc. and Maguire Group Inc. *Quonset Davisville Port and Commerce Park Master Plan – 2003 Revision of 2001 Update. Based on the 2001 Master Plan Update prepared by Parsons Brinckerhoff Quade and Douglas, Inc. 2003. Prepared for the Rhode Island Economic Development Council. Online at <http://www.quonsetpointri.com/>.***

The purpose of the revised Master Plan is to provide direction in the continuing development of the Quonset Davisville Port and Park. The Plan's recommendations have the potential to create nearly 12,000 new jobs within the Park, in addition to existing employment of over 6,000 individuals. As part of the plan, an outside consultant Bonz/REA, Inc. conducted a market analysis of business park development at the site (this analysis is part of the Technical Support Documents for the Plan). Key findings from this analysis include findings regarding the state's overall economy and labor force, competitive advantages of the Quonset site specifically such as the identification of potential market niches, and disadvantages such as the need to finish the Route 403 Project as current highway infrastructure is insufficient.

This Plan builds on a series of master plans for Quonset, most recently the 2001 Update that focused on the site as a cargo port. This 2001 Plan includes an economic analysis of several port scenarios.

**National Marine Fisheries Service. 2004. *Fisheries of the United States – 2003. Available online at <http://www.st.nmfs.gov/st1/publications.html>.***

This report (published annually since 1949) serves as a preliminary report to Congress each year on the nation's fisheries. It presents data on U.S. commercial landings, employment, prices, production of processed products, and recreational catches. The data is derived from many sources, including NMFS field offices and other federal agencies such as the Census Bureau and Bureau of Labor Statistics.

**Ninigret Partners, LLC. 2003. *The Impact of the Defense Industry on Rhode Island: An Overview. Commissioned by the Southeastern New England Defense Industry Alliance. Available online at <http://www.senedia.org/feature.php?newsid=2>.***

This study presents an overview of Rhode Island's defense industry. The author describes the sector in terms of employment, payroll, "spin-off" activity, navy impact, wage levels, tax revenue, real estate, and other contributing economic factors. According to the report, the industry employs just under 16,000 individuals, the total economic impact of its payrolls is roughly \$1.5 billion, and annually generates at least \$53 million in taxes for the state.

**Pacheco, A. and T. Tyrrell. 2003. *The Economic Value of Narragansett Bay A Review of Economic Studies*. Department of Environmental and Resource Economics, University of Rhode Island, Kingston, RI. Online at [www.ci.uri.edu/Projects/PNB/ Documents/3.%20Tim%202-24-03pres.pdf](http://www.ci.uri.edu/Projects/PNB/Documents/3.%20Tim%202-24-03pres.pdf).**

This paper reviews recent studies that attempt to quantify the value of Narragansett Bay, all of which focus on valuing ecosystem services that can be directly associated with economic activity. It provides several useful tables, which summarize the Bay's value according to the literature reviewed. The paper was prepared as part of the Chafee/HUD Project coordinated by the Partnership for Narragansett Bay.

The paper also makes recommendations for future study including the need to reconcile different measures of value, further development of non-market valuation, examination of the whole Bay (not just the RI portion), and the examination of ecosystem services not directly tied to economic activities (such as climate control and erosion control).

**Rhode Island Coastal Resources Management Council. 2003. *Aquaculture in Rhode Island*. Available online at <http://www.crmc.state.ri.us/pubs/index.html#annuals>.**

This annual report provides data on the number of permitted aquaculture facilities and harvest numbers. Data is derived from an annual CRMC survey to all aquaculture leaseholders. More recent reports combine this information with average price information to estimate the industry's economic value. This technique was also used in Scott et al. (2000), which described the aquaculture industry as part of the Narragansett Bay Summit process. These reports also describe aquaculture related activities at the state's universities and other key developments in the industry.

**Rhode Island Department of Environmental Management, Office of Strategic Planning and Policy. 2001. *The Rhode Island Parks and Beach System Study and Asset Management Plan*. Available online at <http://www.state.ri.us/DEM/pubs/index.htm>.**

This plan highlights the economic contribution of the state's Parks and Beach System, using data from DEM-generated data and US Fish and Wildlife. According to the plan, non-resident beach fees contributed \$875,277 to the general fund and park revenues totaled roughly \$3.15 million annually (FY99). Users of the East Bay Bike Path spend approximately \$2.2 million at stores and vendors near the bike path. According to a 1991 U.S. Fish and Wildlife survey, salt-water anglers spent \$51.6 million on fishing equipment, generated \$31 million in salaries, and contributed \$94.9 million in economic output to the state's economy.

DEM's annual reports often include estimates of the total revenue generated by the state's parks and beaches. For instance, the state's parks and beaches had more than 2 million visitors in 2003, accounting for over \$3.3 million in revenues.

**Rhode Island Senate Policy Office. 2002. *The Marine Cluster: An Investment Agenda for Rhode Island's Marine Related Economy*. Available online at <http://www.ci.uri.edu/RIBayTeam/EconMon.htm>.**

This report uses a cluster analysis to describe the state's marine economy and presents recommendations for the development of each sector, including key investments. The sectors discussed include marine recreation/tourism, marine events, fisheries/aquaculture, boatbuilding/related business, shipbuilding, marine transportation, military, and research /technology /development /education. The methodology employed in the development of these sectors incorporated a review of the relevant literature and data, semi-structured elite interviews, and the creation of a consistent framework to present findings.

**Rorholm, N. and J. Farrell. 1992. *Narragansett Bay and the Surrounding Economy*. Prepared for the Narragansett Bay Project.**

This report was prepared as part of the Narragansett Bay Project and is the foundation of the economic description of Narragansett Bay in the 1992 *Narragansett Bay Comprehensive Conservation and Management Plan*. The authors give annual expenditure/revenue estimates for the navy, marine education/research/development, marine transportation, bridges, commercial fishing, marine industry, marine recreation, and waste disposal. They also compare 1989 data with similar data collected in 1967 and 1979. The authors rely on secondary sources of data, which range from federal statistical reports to personal communication with key firms/state agencies.

**Scott, T.M., Alves, D., Rheault, R.B., M.A. Rice. 2000. *Aquaculture in Rhode Island, Narragansett Bay Summit, 2000, White Paper, Working Draft*.**

This report, prepared for the 2000 Narragansett Bay Summit, describes the history, environmental impacts, status and trends of aquaculture in RI. Using data from CRMC annual aquaculture reports, the authors estimate the total value of the state's aquaculture industry at \$213,861 in 1999 (based on the farmgate value of the fish). More recent CRMC reports provide updated values for the industry.

**Tyrrell, T., Devitt, M.F., L.A. Smith. 1994. *The Economic Importance of Narragansett Bay, A Report to the Rhode Island Department of Environmental Management, the Narragansett Bay Project, and the Rhode Island Sea Grant College Program, University of Rhode Island, Kingston, RI*.**

This report estimates the economic value of the Bay by assessing data from a variety of sources including RIEDC, NMFS, and survey/special studies performed at URI. The authors describe impacts in terms of bay-related employment and wages, bay-related tourism, commercial fish catch, recreational fishing trips, property values, and research and regulation of the Bay.

**Tyrrell, T., and J. Harrison. 2000. *Assessing the Economic Value of Rhode Island's Natural Resources*. University of Rhode Island, Department of Environmental and Natural Resource Economics, Kingston, RI.**

This study constructs a quantitative valuation of the state's natural resources. The authors use a utilitarian approach to valuing resources, focusing on five ecosystem services: Food Production, Raw Materials, Recreational, Cultural, and Commercial/Industrial. The study examines this value through both income and gains from trade approaches, and considers only on the value to Rhode Island businesses and residents. According to this study the value of the state's natural resources (in 1997) ranged from \$1.7 to \$2.3 billion using the income method of valuation, and approximately \$8.3 billion using the gains from trade concept.

This study attempted to address some of the methodological problems from the 1994 study, "The Economic Importance of Narragansett Bay" (Tyrrell, Devitt, and Smith) and also served as the source for the summary of Bay values (Table 2) in Pacheco and Tyrrell (2003) on the value of Narragansett Bay.

**U.S. Environmental Protection Agency – Region 1 and the U.S. Army Corp of Engineers – New England District. 2004. Final Environmental Impact Statement for the Rhode Island Region Long-term Dredged Material Disposal Site Evaluation Project. Boston: U.S. EPA. New England Region.**

This EIS was prepared in order to evaluate the impacts of designating one or more long-term ocean sites for dredged material. The report includes a description of socioeconomic environment of the Zone of Siting Feasibility (ZSF) and a larger Economic Study Area (which includes RI's entire coast and a portion of MA's southern coast). This description includes information on commercial and recreational fisheries, shipping, military usage, mineral/energy development, and recreational activities. Much of the data presented in this section is referenced from previous Corps studies as well as data from NMFS and various state reports.

The EIS also includes an economic baseline, which is derived from a 2004 Army Corps report titled "The Economic Significance of Navigation-Dependent Industries within the Zone of Siting Feasibility". This study used the IMPLAN Pro 2.0 Model to estimate employment, labor income, GSP, output, and taxes for targeted industries and evaluated direct, indirect, and induced values for each industry. Targeted industries fell within boating, commercial fishing, water transportation, and other related activities and employment data came from RIEDC. This analysis attributed the following impacts to navigation-related activities in 2000: 53,377 jobs, \$2.4 billion in labor income, over \$7.6 in output, \$3.42 billion in GSP, and \$974 million in tax income.

**U. S. Department of the Interior, Fish and Wildlife Service and U.S. Department of Commerce, U.S. Census Bureau. 2001. 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. Available online at <http://library.fws.gov/pubs3.html>.**

This report summarizes the findings from a 2001 survey used to gather information on the number and impact of U.S. anglers, hunters, and wild-life watching participants. The Fish & Wildlife Service has been conducting the Survey since 1955, and the 2001 data is comparable to the most recent surveys completed in 1996 and 1991.

According to the survey results, the population of saltwater anglers in Rhode Island (in 2001) was 149,000. This population is split 45% to 55% between residents and non-residents of the state. Total expenditures for all the state's anglers totaled 105,649,000 in 2001. The survey results do not attribute expenditures to freshwater and saltwater anglers separately; however, saltwater anglers represent 83% of the states recreational fisherman.

The American Sportfishing Association builds on this national survey in order to provide their own estimates of the economic impacts of sportfishing in the U.S., including employment, wages, and total economic output. Their methodology includes the addition of a prorated portion of other related expenditures by sportsmen not included in the Fish and Wildlife estimates. The Association's statistics are available online at <http://www.asafishing.org/asa/statistics/index.html>.

**Warziniack, T., and J. Creason. 2001. *National Estuary Program Narragansett Bay Economic Profile*. Prepared for the U.S. E.P.A. National Center for Environmental Economics. Draft.**

This report provides an economic profile of the Narragansett Bay Estuary National Program Area (NEP), including 1998 data on business output, employment and income derived from the U.S. BEA, BLS and Census. The study uses IMPLAN data and modeling system to analyze the data (an economic impact modeling system developed by Minnesota IMPLAN Group, Inc.). The findings include all industries within the study area (not solely those tied to marine resources). The study also estimates tourism GDP for the NEP, using U.S. Department of Commerce ratios to allocate the proportion of sector output associated with visitors that are more than 50-100 miles from home (in combination with model ratios determined by previous study by one of the authors).