

Socioeconomic Research & Monitoring: Recreation - Tourism



Photo: Artificial Reef of the Keys

USS *Vandenberg* in its operational days as a missile tracking ship



Photo: Don Kinkaid

USS *Vandenberg* being sunk off Key West



Photo: Don Kinkaid

USS *Vandenberg* with schooling fish

Economic Impact of the USS *Vandenberg* on the Monroe County Economy

Introduction

On May 27, 2009, the USS *Vandenberg*, a decommissioned U.S. Air Force missile tracking and World War II-era U.S. Army troop transport ship, was sunk in the waters off Key West within Florida Keys National Marine Sanctuary. At 520 feet long, the *Vandenberg* is the largest vessel sunk as an artificial reef in the sanctuary. Prior to permitting the sinking of the ship as an artificial reef, NOAA commissioned a study to measure the economic and ecological impacts of the new artificial reef. Understanding the effects of sinking the *Vandenberg* is important as it will inform future management decisions related to artificial reefs.

Artificial Reefs of the Keys, Inc. organized the sinking of the *Vandenberg* as an artificial reef in hopes of increasing local scuba diving charter business and tourism revenues in the local economy. In addition to these proposed economic benefits, it was hypothesized this new artificial reef would yield ecological

benefits by redirecting users from the surrounding natural reefs to the artificial reef, thus reducing pressure on those natural reefs.

In order to study changes in reef use, dive charter business and economic impacts from the *Vandenberg*, Key West dive operators provided logbook records for both before and after the sinking. This logbook information was supplemented with on-site data collection. Estimates were made for total recreational reef use, dive charter business, and the associated economic impacts. By comparing estimates from the pre- and post-deployment periods, it is possible to gauge the impact of this artificial reef.

Environmental Impacts

In order to assess environmental impacts, this study examines the change in total recreational use of the natural reefs prior to and after sinking of the *Vandenberg*. A decrease in the use of the natural reefs is interpreted as an ecological benefit. However, an increase in use cannot be interpreted as a negative ecological impact since this would require an assessment of the ecological carrying capacity of the reefs.

In the time since the *Vandenberg's* sinking, there was a 40.1% increase in the total number of users (scuba divers, snorkelers, and others) on the surrounding natural reefs (Table 1). A 23.5% increase in recreational scuba diving use was observed on the natural reefs (5,214 dives), in contrast to a 442% increase (34,394 dives) on artificial reefs. However, the share of total use on natural reefs did decline from 67% to 46.5% since the *Vandenberg's* deployment.

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Table 1. Net changes in total reef use following the deployment of the *Vandenberg*

Reef Type	Absolute and Percent Changes							
	Dives		Dives		All		Total	
	SCUBA	%	Snorkelers	%	Others*	%	Total	%
Natural Reefs	+5,214	+23.5	+748	+22.0	+18,270	+52.3	+24,232	+40.0
Artificial Reefs	+34,394	+442.0	+493	+252.9	+32,806	+150.5	+67,693	+227.3
Total	+39,608	+132.3	+1,241	+34.5	+51,076	+90.1	+91,925	+101.9

* This includes those that went out on charter or other boats, but who did not participate in any further activity, as well as those who participate in fishing.

Table 2. Net changes in dive charter operation business following deployment of the Vandenberg

Reef Type	Absolute and Percent Changes							
	Dives		Dives		All		Total	
	SCUBA	%	Snorkelers	%	Others*	%		%
Natural Reefs	+9,007	+64.4	+748	+22.0	+567	+94.7	+10,322	+57.4
Artificial Reefs	+28,959	+501.3	+483	+247.7	-1,214	-59.9	+38,751	+484.4
Total	+37,966	+92.1	+1,231	+34.2	-446	-17.0	+49,073	+188.9

* This includes those that went out on the charter, but who did not participate in any further activity.

Environmental Impacts (cont.)

Despite the decline in the overall percentage of divers visiting natural reefs, rising demand for recreational diving caused an increase in total use across the board. Thus, the hypothesis that introduction of the *Vandenberg* as an artificial reef would reduce use (pressure) on the surrounding natural reefs was not supported.

Local Dive Charter Business

When considering the potential benefits to the dive charter industry, the study compared the number of dives made by scuba divers, snorkelers and the other non-diving passengers onboard (those onboard but not snorkeling or diving) pre- and post- *Vandenberg* sinking. From the pre-deployment to the post-deployment period, the results show an increase of 92.1% or 37,966 dives by scuba divers; an increase of 34.2% or 1,231

dives by snorkelers; and a decrease of 446 other non-diving passengers, or a 17% decrease in business from these customers (Table 2). In total, there was an increase of 49,073 in the number of dives with paying customers, or a 188.9% increase in business.

Local Economy

The net changes in total recreational expenditures from the pre- to post-deployment period indicate that total

recreational expenditures increased by \$6.5 million, which generated a total impact on sales/output of \$7.29 million, about \$3.2 million in income, and the creation of 105 new jobs (Table 4). As expected, visitors accounted for a much larger share of this growth than residents (86.4% vs. 13.6% respectively).

Conclusions

It was hypothesized that introducing an artificial reef to Key West would benefit the local environment, the local dive charter industry, and the larger local economy. Results from this case study are not consistent with the first hypothesis about the benefit to the local environment, but the latter two hypotheses are supported with large increases in local dive charter business and the greater local economy grew in terms of sales/output, income and employment.

Table 3. Net economic impacts of the deployment of the Vandenberg

	Visitors	Residents*	Total
Expenditures	\$5,624,686	\$884,578	\$6,509,264
Sales/Output	\$6,299,652	\$990,726	\$7,290,378
Income	\$2,830,525	\$357,382	\$3,187,907
Employment	93	12	105

* Only export sector of resident spending included and all spending includes multiplier impacts.

The full report *The Economic Impact of the USS Vandenberg on the Monroe County Economy* and the technical appendix with explanations of the methods and more detailed results is available on the web at http://www.sanctuaries.noaa.gov/science/socioeconomic/floridakeys/recreation/new_reefs.html

For further information, please contact:

Dr. Vernon R. (Bob) Leeworthy
 Chief Economist
 Office of National Marine Sanctuaries
 NOAA, National Ocean Service
 1305 East West Highway N/NMS
 Silver Spring, MD 20910
 (301) 713-7261
 Bob.Leeworthy@noaa.gov



Photos: Don Kinkaid