Special Report No. 38
of the

ATLANTIC STATES MARINE FISHERIES COMMISSION

The Role of Vessels as Artificial Reef Material on the Atlantic and Gulf of Mexico Coasts of the United States

December 1994

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December 1994

Preface

Funding for this project was provided through a cooperative agreement (grant no. 14-48-0009-93-1256) between the Atlantic States Marine Fisheries Commission and the U.S. Fish and Wildlife Service Federal Aid in Sport Fish Restoration Program (Wallop-Breaux).

Acknowledgements

The Commission gratefully acknowledges the efforts of the Artificial Reef Committee in preparation, and review of this document. Special thanks goes to the members of the Artificial Reef Committee of the Gulf States Marine Fisheries Commission for their assistance and participation in the state survey. Thanks also goes to the North Carolina Division of Marine Fisheries for donating the time of Mr. Gregg and Mr. Murphey to work on this project.

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INTRODUCTION

Artificial reef programs have traditionally relied upon vessels as the primary source of material for artificial reef construction. Over the past several years, the increasing cost of preparing these vessels and the fluctuating availability of suitable craft have led several states to use other types of reef materials. In spite of these problems, vessels still play a major role in many state and local artificial reef programs. This survey was developed to assess the role of vessels as artificial reef materials in the Gulf and Atlantic States.

Information was collected regarding the historical use of vessels as artificial reefs. Special interest was given to the use of vessels obtained under Public Law 92-402, also known as the Liberty Ship Act. This act enabled states to acquire derelict Liberty ships from federal reserve fleets for use as artificial reef material. The law was later amended to include other classes of vessels. The survey also sought to obtain information to assess the future roe of vessels as artificial reefs and in particular, vessels obtained under P.L. 92-402 (as amended). The survey was distributed to state artificial reef program coordinators from Massachusetts through Texas.

HISTORICAL USE OF VESSELS BY ATLANTIC AND GULF COAST STATES

Construction of artificial reefs using vessels has occurred primarily off Atlantic Coast states (58%) and Florida (34%). Gulf Coast states have not used vessels extensively (8%) (Figure 1). This trend is even more apparent in the past five years during which 135 vessels were deployed off Atlantic Coast states and one vessel was deployed off a Gulf Coast state.

The majority of vessels used for construction of artificial reefs is small (Figure 2). Vessels 150' length overall (LOA) or less comprise 77% of all vessels used as artificial reefs by the respondent agencies. Vessels less than 75' LOA represent 47% of all vessels used. Medium sized vessels (151-300' LOA) represent 14% and large vessels (>300' LOA) only account for 9% of the

vessels used as artificial reefs off the Atlantic and Gulf Coast states.

Barges (33%) and landing craft (28%) are the primary types of vessels used as reef materials by Atlantic and Gulf Coast states (Figure 3). Ships of all classes account for 14% of vessels on artificial reefs. Barges, landing crafts and ships comprise 75% of all vessels used as artificial reefs by respondent agencies. The remaining 25% of all vessels includes tugs (8%), fishing vessels (7%), miscellaneous other vessels (7%) and drydocks (3%) (Figure 3).

While ships only represent 14% of all vessels on artificial reefs off Atlantic and Gulf Coast states, they attract the most media attention and usually represent the largest expenditure of artificial reef construction funds. Most ships used as artificial reefs are transports (56%) which include Liberty and Victory ships (Figure 4). Tankers represent 21% of all ships. The remaining types of ships used for artificial reef construction include cargo ships (6%), dredges (4%), warships (2%) and miscellaneous other types of ships (11%).

Hull composition of vessels used as artificial reefs is primarily steel (87%) (Figure 5). Wood hulls represent 11% of all vessels on Atlantic and Gulf Coast reef sites. Other hull types including ferro-cement and fiberglass only account for 2% of all vessels used as artificial reefs off Atlantic and Gulf Coast states.

THE ROLE OF P.L. 92-402 IN ARTIFICIAL REEF PROGRAM ON THE ATLANTIC AND GULF COASTS

Forty-one vessels have been used as artificial reefs off Atlantic and Gulf Coast states under Public Law 92-402 (P.L. 92-402) excluding Florida. The majority of these vessels went to Texas (29%), North Carolina (20%) and Virginia (15%) (Figure 6). Interestingly, 54% of the P.L. 92-402 vessels were deployed off three Gulf Coast states. The remainder were deployed from Georgia through New Jersey on the Atlantic Coast (Figure 6). The majority of P.L. 92-402 vessels were deployed from 1974 through 1978 (Figure 7). No vessels were obtained under this

law from 1979 through 1987 (Figure 8). In 1984, P.L. 92-402 was amended by P.L. 98-623 to include ships other than the Liberty Class for artificial reef construction. Only 15% of all P.L. 92-402 vessels were deployed from 1988 through 1992 (Figure 7).

Four states have not deployed any P.L. 92-402 ships: Massachusetts, New York, Rhode Island and Louisiana. Atlantic Coast states that used P.L. 92-402 vessels for artificial reef construction include Virginia, North Carolina, South Carolina and Georgia. Maryland deployed a submarine that was obtained under P.L. 98-623. Gulf Coast states that have used P.L. 92-402 vessels include Alabama, Mississippi and Texas. Information reporting the use of P.L. 92-402 vessels by programs in Florida was unavailable.

Most states report the application process for P.L. 92-402 vessels is acceptable. North Carolina and South Carolina commented that the application process takes too long and needs to be streamlined. All respondents contracted out the preparation, cleaning and towing of P.L. 92-402 vessels as a package. Inspection of vessels prior to sinking is usually done by the United States Coast Guard at the request of the Environmental Protection Agency. The vessels deployed off Virginia were inspected by Lloyds of London. The only problem reported with the inspection process was with a vessel deployed off New Jersey. The preparation and cleaning were conducted in North Carolina which is in the Fifth Coast Guard District. It was then towed to New Jersey for deployment which is in the Second Coast Guard District. Cosmoline, a petroleum based protective coating used on machinery, parts of vessels, and fuel tanks was allowed to repair on the vessel by the Fifth Coast Guard district if the compartments containing it were filled with water and the hatches sealed shut. The Second Coast Guard District balked at passing the inspection until EPA sent a letter saying Cosmoline was not a major concern.

Availability of P.L. 92-402 ships has always been uncertain. Several states report getting conflicting information from the Maritime Administration regarding availability of specific vessels. This problem was cited as the reason why Virginia has not deployed any P.L. 92-402 vessels since

the 1970's.

Programs sinking P.L. 92-402 vessels report using explosives as the method of choice for deployment. Four states report using military personnel for their explosives work. North Carolina and Georgia used United States Marine Corps personnel; Virginia and South Carolina used United States Navy personnel for their explosives work. These military groups use the artificial reef deployment as a training exercise and provide the explosives as well as the personnel. The New Jersey State Police Bomb Squad conducted the explosives work in that state. Texas reports using private contractors in the 1970's for the explosives work on their twelve P.L. 92-402 vessels. Transportation of these contractors and explosives was provided by the United States Coast Guard.

Only three states report being required to maintain buoys on their reef sites: North Carolina, Georgia and Texas. States using existing aids to navigation or no marking include: New Jersey, Virginia, South Carolina and Alabama.

Comments on the topic of P.L. 92-402 vessels by state:

South Carolina - Scrappers are getting most of the MARAD fleet. If the PCB problem can be cleared, it would be good to set aside some Victory ships before they are gone.

New York - Does not have enough funding to get any P.L. 92-402 vessels.

Virginia - Could not get more ships due to conflicting reports from MARAD on the availability of ships.

Maryland - Maryland creates problems for itself by not releasing donors of reef materials from long-term liability.

Texas - Lighted buoys were required. This made marking costs exorbitant - - $25K/buoy/year plus acquisition costs.

THE FUTURE USE OF VESSELS IN ARTIFICIAL REEF PROGRAMS ON THE ATLANTIC AND GULF COASTS OF THE UNITED STATES

The types of vessels that best suit the future needs of artificial reef programs on the Atlantic and Gulf Coasts include medium and large ships >150'LOA (7 states), steel barges and tugs (7 states,), small steel vessels ≤150' LOA (6 states,), landing craft (4 states) and wood vessels (1 state). Louisiana and Texas report no vessels are needed for future reef construction because they are using derelict oil platforms for artificial reefs.

Respondents to this survey showed strong agreement on the potential benefits and problems associated with using surplus vessels for artificial reefs that have been stripped and salvaged prior to being transferred to an artificial reef program. The primary benefit seen in this scenario is that reef programs could save money if the vessels were cleaned to United States Coast Guard specifications when they were salvaged (63% of respondents). The greatest potential problem with using previously salvaged vessels is that salvageable materials would no longer be available to offset cleaning and transportation costs (44% of respondents). Other potential problems seen by respondents were:

- Structural integrity and stability of the vessel may be adversely affected by salvage operations. (25% of respondents)

- Salvage operations may exacerbate problems with contaminants such as asbestos and PCBs. (13% of respondents)

- Salvage operations may reduce complexity or profile of the vessel too much. (13% of respondents)

Artificial reef programs on the Atlantic and Gulf Coasts use a wide variety of funding sources for vessel construction projects. Private donations (38%) provide the majority of funding for vessel construction in respondent's programs followed by miscellaneous sources (25%), no funding for vessels (17%), Federal Aid in Sportfish Restoration (13%) and state funds (8%). The average amount of money spent for construction of artificial reefs using vessels per year for the past five years is presented in Table 1 for the respondent programs. Some states had little or no funding for vessels until recently. For the comparison, the funding was divided over the five year period even if only one year actually had all the funding. Several Gulf Coast states were not interested in vessels due to the Rigs to Reefs Program.

Respondents were asked if vessel availability was not a consideration, how many vessels could their program fund and deploy in the next 5 years. Programs from New York through Georgia could fund and deploy 13 large ships (>150'), 87 small ships (≤150'), and 25 unidentified vessels. Louisiana and Texas are not interested in vessels. Alabama could fund and deploy 25 to 30 unidentified vessels, however this program's emphasis is currently on using tanks as artificial reef material. The three major factors that keep programs from using vessels as artificial reefs are funding (69% of respondents), pollutants such as PCBs and asbestos (31% of respondents), end concerns regarding permitting and liability (13% of respondents).

Since this survey was conducted, members of the ASMFC Artificial Reef Advisory Committee were told by the Environmental Protection Agency that deployment of vessels containing PCBs violates the Clean Water Act. While this finding has not been put in writing, pending the completion of a study by the U.S. Navy, most states do not want to risk procuring a surplus military ship and not being allowed to deploy it on an artificial reef. This development reduces the importance of ex-military ships to artificial reef programs, however non-military vessels such as freighters, tugs and barges are still viable artificial reef materials. These types of vessels will continue to be an integral part of most artificial reef programs on the Atlantic Coast of the United States.

Table 1. The average amount of money spent for construction of artificial reefs using vessels per year for the past five years by the respondent programs.

States	
North Carolina	$63K
Georgia	$20K
South Carolina	$18.5K
New Jersey	$40K
Maryland	$6.5K
New York	$1K
5 states	$0

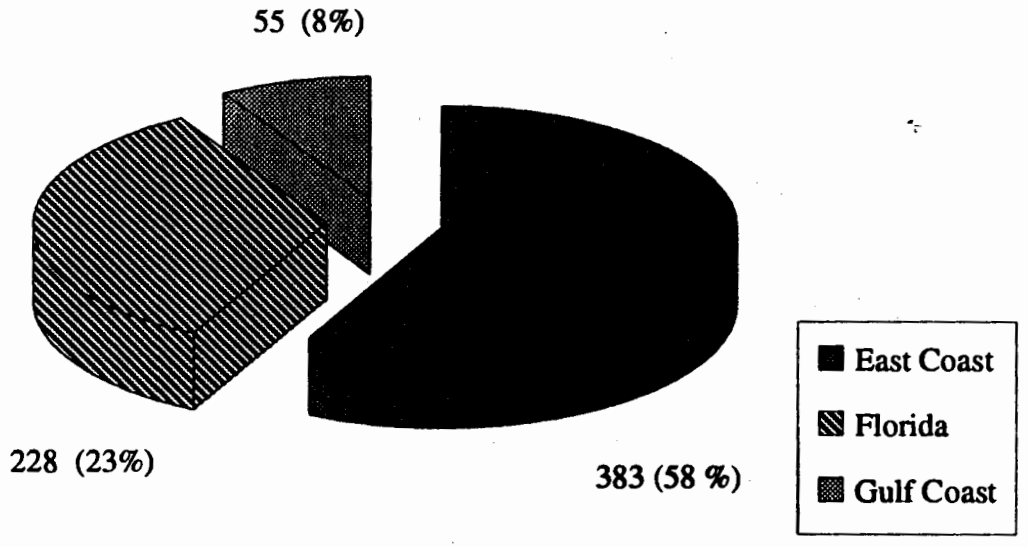

Figure 1. Number of Vessels Used as Artificial Reef Material in Three Regions of the United States.

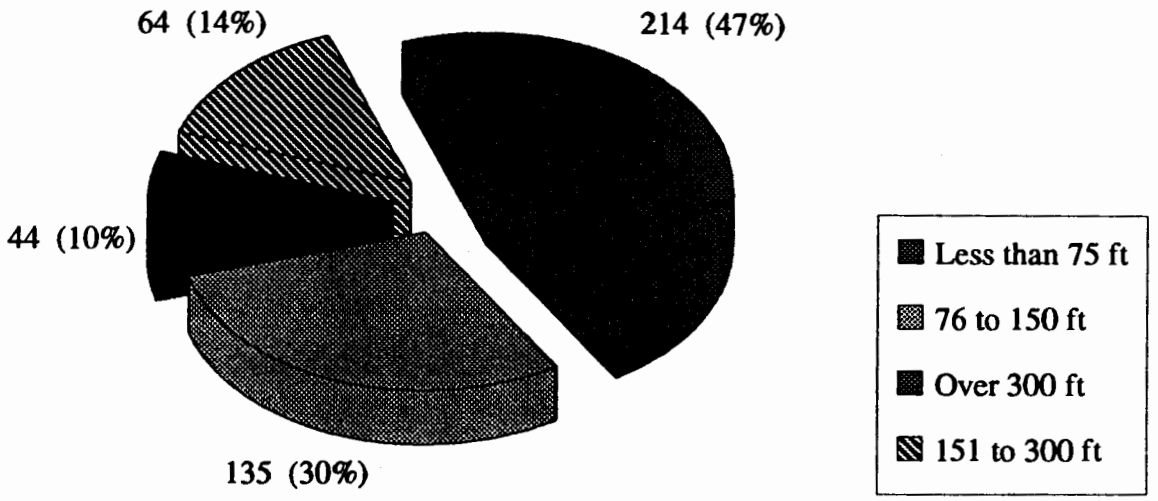

Figure 2. Size of Vessels Used as Artificial Reef Material off the Atlantic and Gulf Coast States of the United States.

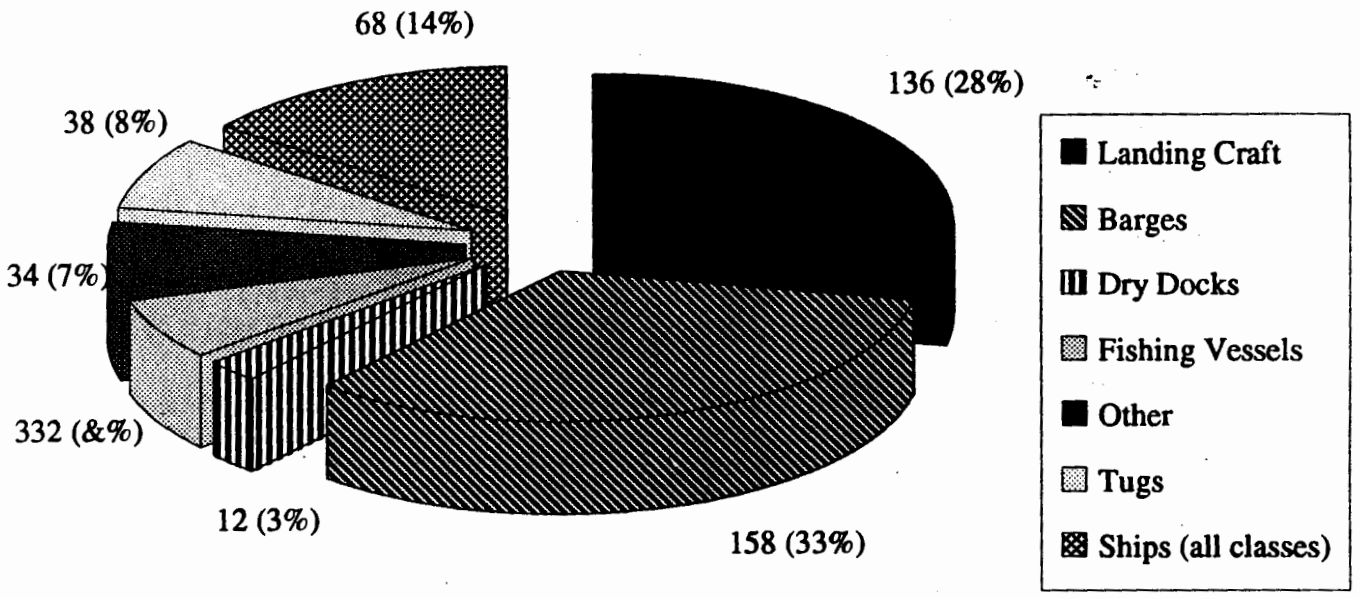

Figure 3. Types of Vessels Used as Artificial Reef Material off the Atlantic and Gulf Coast States of the United States.

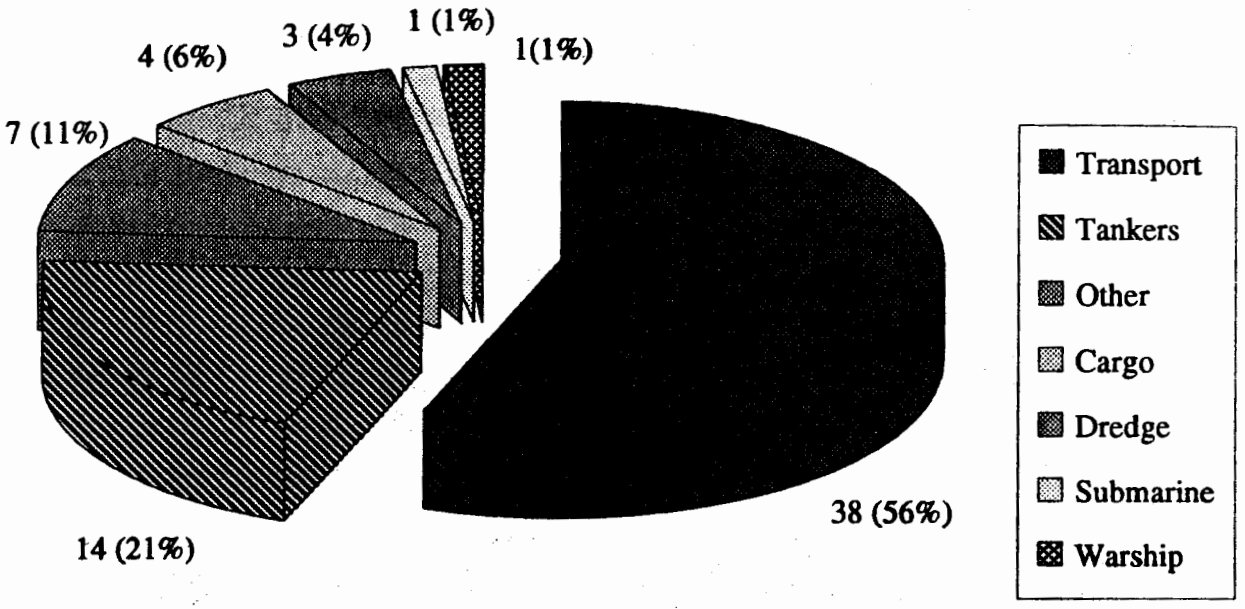

Figure 4. Types of Ships Used as Artificial Reef Material off the Atlantic and Gulf Coast States of the United States.

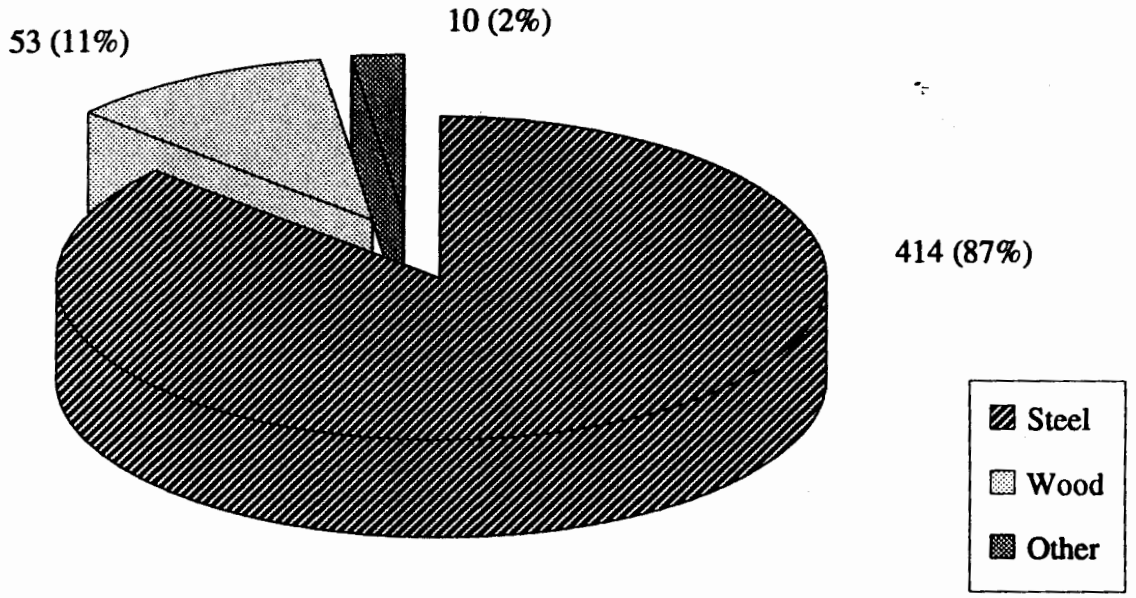

Figure 5. Hull Composition of vessels Used for Artificial Reef Material off the Atlantic and Gulf Coast States of the United States.

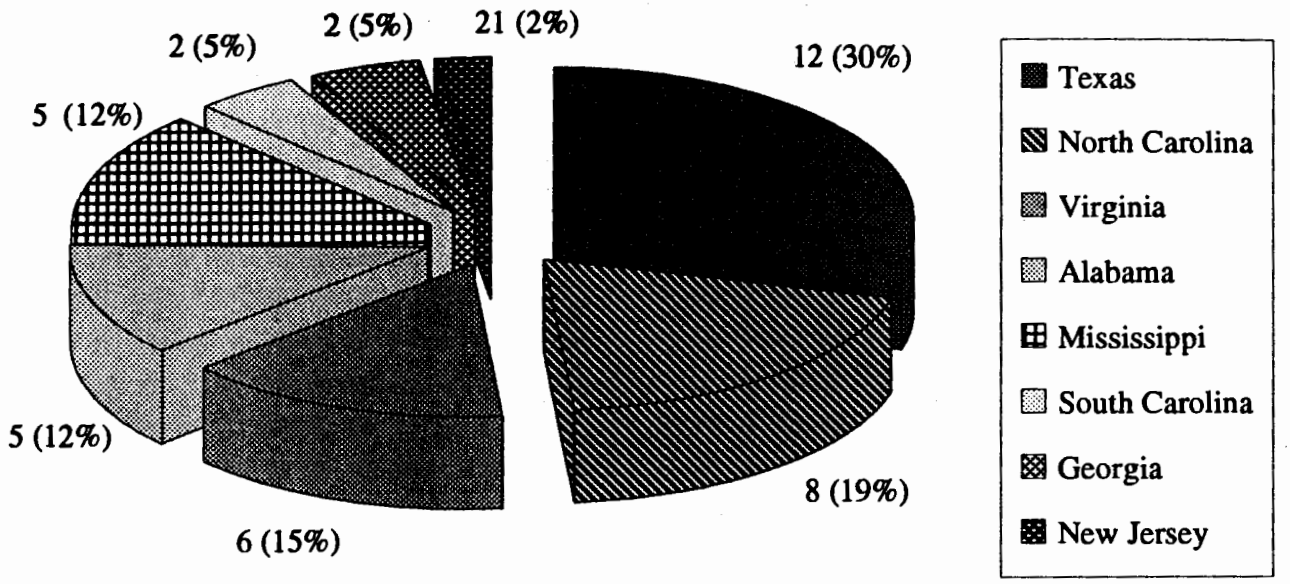

Figure 6. Number of P.L. 92-402 Ships Deployed by Atlantic and Gulf Coast States as Artificial Reef Material.

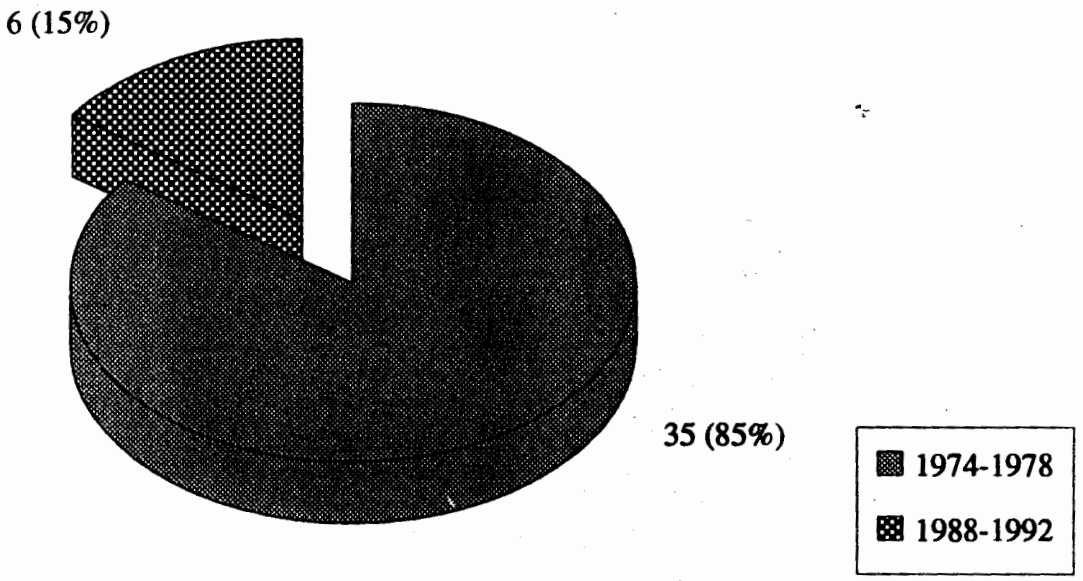

Figure 7. Proportion of P.L. 92-402 Ships Deployed as Artificial Reef Material During Two Eras of Artificial Reef Construction.

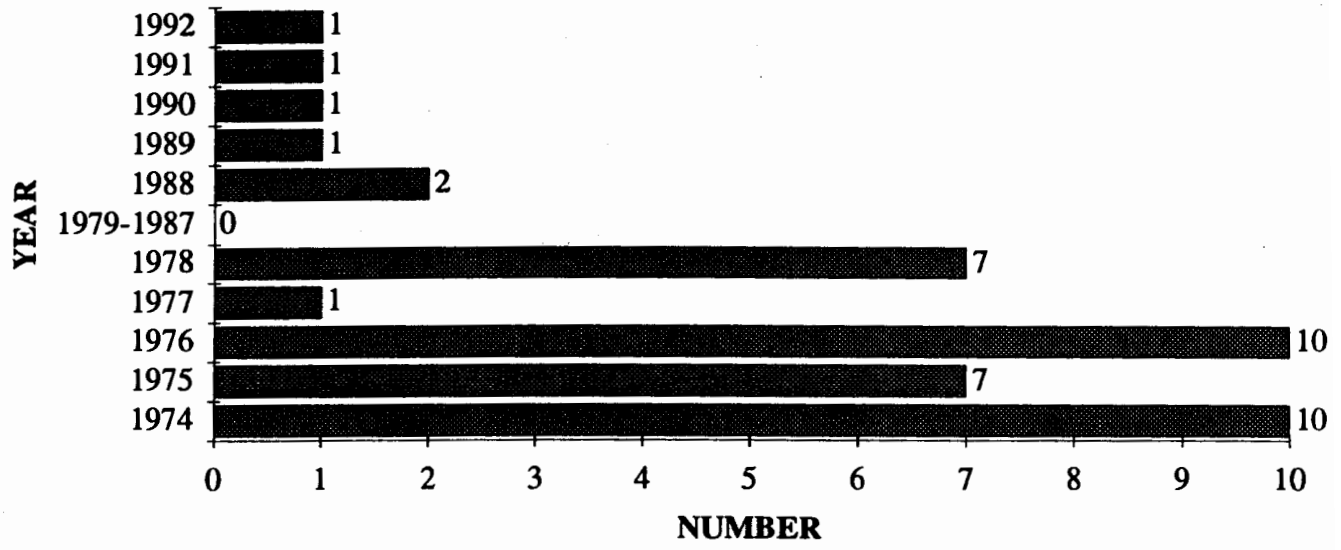

Figure 8. Number of P.L. 92-402 Ships Deployed as Artificial Reef Material During Two Eras of Artificial Reef Construction by year.