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Alabama's Artificial Reef Program: Building Oases in the Desert

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COMMENTARY

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ALABAMA'S ARTIFICIAL REEF PROGRAM: BUILDING OASES IN THE DESERT.—As is well known, certain habitats are more conducive to species diversity and richness than others. The waterbottom offshore from Alabama in the Gulf of Mexico is principally a flat mud/sand aggregate that originally supported mainly finfish species of little recreational or commercial value (Shipp, pers. comm.). Shortly after the Second World War, local charterboat captains and commercial fishermen discovered that they caught valuable reef fish at locations where artificial structures (ships, planes etc.) had accidently found their way into the Gulf of Mexico. It did not take them long to equate bottom structure with reef fish and make the transition from finding material to placing material on the bottom. This proved to be successful, and in the early 1950s they approached the Alabama Department of Conservation and Natural Resources and asked if the department would deploy approximately 250 car bodies to act as artificial reefs. The department agreed and thus the Alabama artificial reef program began.

Currently, there are 1,200 square miles offshore of Alabama that are designated by the Army Corps of Engineers for the construction of artificial reefs. Within that area, there are an estimated 8,000–10,000 reefs. The reefs have been constructed from a variety of materials including car bodies, mothballed liberty ships, shrimp boats, barges, concrete culverts, dry docks, military tanks, small planes, small boat hulls, and a variety of other small items. A protocol has evolved over the years to permit only those materials that are environmentally safe and have proven to not move or come apart.

Because of the artificial reefs offshore of Alabama, fishermen there now catch 35–40% of the recreationally caught red snapper in the Gulf of Mexico (Schirripa, 1998). Considering that Alabama's shoreline constitutes approximately 5% of the northern Gulf of Mexico, that is an incredible statistic. Data collected from the video/trap set portion of the Southeast Area Monitoring and Assessment Program (SEAMAP) show that during the period of 1993–96, Alabama conducted an average of 5% of the sets, but in contrast captured 91% of the red snapper Gulfwide. Other reef fishes including grouper, amberjack, trigger fish, vermillion snapper, and lane snapper are now caught because of the reefs.

As the reef program has developed, the fishing industry has expanded. Currently, there are 143 charter boats in Alabama that fish in the Gulf waters. The vast majority, 90% plus, bottom fish for red snapper as their primary target species. It has been estimated that the charter industry generates approximately 60 million dollars in revenue annually (Malone, 1994). The economic contribution of the private recreational sector has not been directly estimated, but it would appear to be just as valuable, if not more so, than the charter industry. A survey conducted in the mid-1990s (Thomas, 1996) to define the saltwater/freshwater split in the allocation of federal sport-fish monies included questions on the target species. It was expected that an inshore species such as spotted seatrout or red drum would rank first, but red snapper was the number 1 targeted fish for Alabama saltwater fishermen. The survey also pointed out that this was not just a coastal phenomenon. The survey reported that of the people that fished in upstate Birmingham, 33% fished in saltwater.

The reef program has not only affected the fishermen; growth of the service industries has benefited greatly as well. Not only sale in bait and tackle shops, but the very existence of most of the coastal marinas and marine recreational boat sales, can be directly attributed to the artificial reefs.

There is no doubt, based upon historical records and knowledge of species supported by the natural bottom type offshore from Alabama, that without artificial bottom structures to provide hard substrate and vertical relief, reef fish would not inhabit the waters off Alabama. This would in turn eliminate the 60 million dollar directed recreational fishery and greatly reduce the commercial reef fish fishery. The associated effects of this change would drastically affect the economy of south Alabama. This is particularly true of Orange Beach, which bills itself as the "Red Snapper Capitol of the World," and Gulf Shores because that community provides much of the lodging and services to the visitors who come to fish. The number of visitors is not limited to the fishermen themselves but includes, in many cases, spouses and children. Finally, the effect becomes even farther reaching when the

hundreds of people employed in the support industries are considered along with their families; all businesses in the communities would suffer if these individuals were not employed and living in the community. Thus, the loss directly and indirectly related to the absence of the artificial reef system offshore from Alabama quickly becomes virtually inestimable.

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IS THE GULF OF MEXICO READY FOR DEEP-OCEAN ENVIRONMENTAL REGULATION?—In a recent critical examination of how well deep-sea diversity hypotheses serve the needs of ocean environmental management (Carney, 1997), it was pointed out that many exploitation plans proposed one and two decades ago have fizzled out. Nodules are not worth mining, waste dumping is effectively banned, and ecologically ill-advised deepsea fisheries may be short lived. For large areas of the World Ocean it may be reasonable to assume that there are few new environmental threats to the deep ocean. I would like to argue that this is decidedly not the case for the Gulf of Mexico.

The Gulf of Mexico is the only region of the U.S. Exclusive Economic Zone (EEZ) undergoing actual deep exploitation at this time, and this exploitation is progressing with only a minimal knowledge base to support environmental regulation. Such a knowledge base has not been developed because during the past decade there has been a loss of interest in the deep sea on the part of various federal agencies. When Congress decreed that high-level radioactive waste must be disposed of on land, DOE (Department of Energy) research into the "ocean option" came to a sudden halt. When the time came for renewal of the Deep Seabed Hard Minerals Act, NOAA (National Oceanic and Atmospheric Administration) recognized the near demise of the once exciting deep manganese nodule mining industry and shut down its joint U.S.–Russian research program. And, as Congress established and amended laws that implemented the restrictions on ocean dumping of the London Convention (Convention on the Prevention of Marine Pollution from Dumping of Wastes and Other Matter), NOAA and the Environmental Protection Agency (EPA) let deep-water projects drop in priority.

In effect, much deep-ocean research outside of the Gulf of Mexico was terminated prior to completion for policy or economic reasons. Most of the terminated research was research and development related, and it is hard to see how the failure to develop uneconomic or banned technologies is much of a loss. However, considerable effort was being extended in anticipation of deep-ocean environmental regulation. Such work not only took the traditional faunal survey approach but also tried to incorporate ecological processes. Thus, the business of developing a science-based strategy for deep-ocean environmental regulation was brought to a premature end.

Is Deep Oil Development an Environmental Threat?

Offshore oil and gas development on the continental shelf is an accepted fact of ocean utilization off the coasts of all Gulf states except Florida. Like shelf-depth development, Minerals Management Service (MMS) and EPA exert regulatory authority in deep water. Is this a major environmental concern? It is easy to accept the argument that it is not. Indeed, the best studies in shallow water have found only local chronic effects (Peterson et al., 1996), and larger-scale impacts seem to be lost in the noise of naturally fluctuating marine populations (Carney, 1987). However, impact due to shelf depth development has been kept to such a minimal and acceptable level due to informed regulation.

The regulations that have assured an acceptable level of impact can be considered informed regulation. These regulatory strategies

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