



## OFFSHORE AQUACULTURE AND THE FUTURE OF SEAFOOD PRODUCTION – THE USA EXPERIENCE

An underwater view of an Aquapod offshore cage (Photo Courtesy of Snapperfarm, Inc)

---

### DANIEL BENETTI, PH.D.

Chairman, Division of Marine Affairs and Policy  
Associate Professor and Director of Aquaculture  
University of Miami Rosenstiel School of Marine and Atmospheric Science

---

### A NEW LEGISLATIVE FRAMEWORK

The 2007 National Offshore Aquaculture Act, submitted to Congress by Commerce Secretary Carlos Gutierrez on March 12, 2007, proposes to create a regulatory framework to centralise, streamline and simplify the permitting process for developing aquaculture in the U.S. federal waters. Its implementation will allow U.S. entrepreneurs to compete in an industry that is poised to continue to grow at almost 10% per year and is being developed mostly in foreign countries. The revised bill proposes to promote growth of a U.S. aquaculture industry that is economically viable, socially responsible and environmentally sustainable.

### THE RESEARCH AND DEVELOPMENT SCENE

University of Miami (UM) scientists have been receiving funds from NOAA to conduct research addressing technology and environmental issues regarding the development of offshore aquaculture in the U.S. UM scientists are focusing on developing advanced technology that is environmentally sustainable, socially responsible and economically feasible. UM primary target species is

cobia (*Rachycentron canadum*), a high-quality marine fish that exhibits extraordinary growth rates up to one order of magnitude faster than most other fish such as snappers, snooks, pompanos, flounders, etc. UM scientists are part of a major NOAA-funded interdisciplinary, multi-institutional effort to demonstrate the technological, environmental and economic feasibility of offshore aquaculture in the US.

Researchers are collaborating with the private sector to conduct studies in a handful of pioneer offshore fish farm initiatives in Puerto Rico, Hawaii, California and New Hampshire. These offshore aquaculture demonstration projects have high-tech cages (net pens) stocked with hatchery-reared fingerlings of endemic, native species such as cobia, snapper, yellowtail jacks, moi and cod – species whose fisheries are mostly depleted. It has been shown that these high-quality marine fish can be ecologically efficiently produced from eggs to market with no significant or cumulative environmental impact. Research has focused on aquafeeds, diseases, pollution and escapees, which are all major contentious issues related to sustainable aquaculture development. Aquaculture scientists, agencies and the industry are



Juvenile cobia in an offshore cage.

Photo courtesy: Snapperfarm

addressing these issues by improving quality while reducing fishmeal and fish oil use in feeds to reduce reliance on wild fish. Improved Feed Conversion Rates (FCR), Feed Economic Conversion (FEC) and Feed Conversion Efficiency (FCE or wild fish / farmed fish ratio) are being achieved. Proactive health management strategies such as probiotics and vaccines are being used as prophylaxis for diseases prevention and control. Likewise, water column and benthos pollution due to organic and inorganic wastes have been minimized as modern aquaculture operations are moving into exposed areas in the open ocean, where assimilation capacity is increased due to greater depths and stronger currents. To minimize possible risks of escapees to the wild populations, advanced underwater engineering is allowing for the deployment of systems that are predator resistant and sturdy enough to withstand harsh elements and strong storms. Besides, only native species with wild genes infusions are being cultured. GMOs (genetically modified organisms) and exotic species have not being used in the demonstration projects currently being conducted in Puerto Rico, Hawaii, California and New Hampshire and are not recommended for commercial aquaculture development. Industry, government agencies (NOAA,

USDA, FAO, among others), researchers, regulators and organizations are committed to improve sustainability and eco-efficiency of aquaculture for both environmental and economic concerns. Indeed, there have been numerous reports and publications showing that the ecological impacts caused by net pen aquaculture are low relative to the yields produced.

## IN CONCLUSION

The offshore areas of the US, its Islands and Territories have extraordinary potential for the development of an environmentally sustainable offshore aquaculture industry. The U.S. is ahead of the world in technology for offshore aquaculture and cannot afford to lose that edge. Moving the industry offshore is the right path to the development of a low impact, high yield industry that will produce most needed seafood while creating jobs and other socio-economic benefits. Beyond economics, the importance of developing the offshore aquaculture industry in the US Economic Exclusive Zone may become a matter of national food security soon. The 2007 National Offshore Aquaculture Act is the first step towards U.S. autonomy in seafood supply.