

# The History of Aquaculture in the Caribbean through Presentations from 1948 – 2007

LEROY CRESWELL

Florida Sea Grant, 8400 Picos Road, Ft. Pierce, Florida 34945 USA

## ABSTRACT

During the first three decades of GCFI, aquaculture was minimally represented at the annual Institutes (1 – 5 papers), probably because aquaculture was a nascent industry in the western hemisphere, and the focus of GCFI was on developing management strategies for once abundant fisheries resources. The Caribbean Aquaculture Association (CAA), established in 1984, developed and moderated the GCFI aquaculture sessions, and convened its meetings at each GCFI Institute. In 1988, at the 41st conference, GCFI hosted a special session in cooperation with the World Aquaculture Society. This was later published as “Potential for Aquaculture in the Caribbean” by WAS. The themes of aquaculture sessions at GCFI institutes typically reflected the interests of the host country; some examples include marine fish culture at the 38th GCFI (Martinique, 1985), tilapia culture at the 42nd GCFI (Jamaica, 1989), and saltwater tilapia culture at the 44th GCFI (Bahamas, 1991). Queen conch culture has had enduring interest throughout the region for several decades, beginning with the 35th GCFI (Bahamas, 1982) and continuing at those institutes hosted by Mexico (45th, 50th, 55th), where significant contributions have been made by CINVESTAV, universities, governmental agencies, and private interests. With the establishment of the Caribbean/Latin American chapter of the World Aquaculture Society, the Caribbean Aquaculture Association dissolved (circa. 2000). Recently, due to the growing presence of WAS in the region and shifting priorities for GCFI, aquaculture has played a diminished role at annual Institutes.

KEY WORDS: Aquaculture, GCFI history

## Historia de la Acuicultura en el Caribe a Través de los Trabajos Presentados Entre 1947 y 2007

El tema de la acuicultura estuvo pobremente representado a lo largo de las tres primeras décadas de historia del Instituto de Pesquerías del Golfo y el Caribe (GCFI, por sus siglas en inglés), con apenas de 1 a 5 contribuciones anuales. Posiblemente ello haya estado vinculado al hecho que la acuicultura era solo una industria incipiente en el hemisferio occidental, y a que el interés del GCFI se encontraba centrado en desarrollar estrategias de manejo adecuadas para los alguna vez abundantes recursos pesqueros de la región. Sin embargo, el tema comienza a tomar auge gracias a la creación de la Asociación de Acuicultura del Caribe (CAA, por sus siglas en inglés), en 1984, quien comienza a realizar sus encuentros anuales dentro de las reuniones del Instituto y a promover secciones especiales en las mismas. Así, en 1988, durante la 41ava conferencia, el GCFI organizó una sección especial que contó con la cooperación con la Sociedad Mundial de Acuicultura (WAS, por sus siglas en español), y cuyas ponencias fueron posteriormente publicadas por el WAS bajo el título de “Las Potencialidades de la Acuicultura en el Caribe”. Sin embargo, los temas en la sección de acuicultura del GCFI típicamente han reflejado los intereses del país anfitrión, pudiendo resaltarse el dedicado al Cultivo de Peces Marinos durante la 38ava reunión (Martinica, 1985), el orientado hacia el Cultivo de Tilapia en el 42avo (Jamaica, 1989), y el que trató sobre Cultivo de Tilapia Marina en la 44ava reunión (Bahamas, 1991). Por su parte, el cultivo del Caracol reina ha logrado captar el interés de toda la región durante varias décadas, comenzando con el 35avo encuentro (Bahamas, 1982) y continuando con las reuniones llevadas a cabo en México (45ava, 50ava, 55ava), gracias a los significativas contribuciones hechas por el CINVESTAV, las universidades, las agencias de gobierno y el sector privado. El CAA se disolvió en el año 2000, dando paso al establecimiento del Capítulo Caribeño/Latinoamericano del WAS. Recientemente, debido a la creciente presencia del WAS en la región y al cambio de prioridades en las áreas temáticas del GCFI, la acuicultura ha dejado de jugar un rol importante en las reuniones del instituto.

PALABRAS CLAVES: Acuicultura, Historia de GCFI

## INTRODUCTION

Growing seafood in the tropical waters of the Caribbean has always seemed a captivating idea to practitioners of aquatic farming. Year-round growing potential, relatively pristine waters, inexpensive land and labor, and the perception (usually false) of few regulatory restraints have been touted over the years, although a good number of these perceptions are without foundation. Throughout the eastern Caribbean, the clear tropical waters are low in nutrients, and therefore, low in phytoplankton productivity, a fact that limits the cultivation of filter feeding bivalves, and most mollusk cultivation has focused on the herbivorous gastropod, the queen conch *Strombus gigas*.

The situation is quite different along the continental coastline of Venezuela, Mexico, Colombia, Guyana and Panama, where upwelling of nutrient-rich water supports phytoplankton production and, as a result, the culture of

bivalve molluscs. Similarly, the potential for the cultivation of marine fish varies considerably throughout the region, largely a function of the availability (and cost) of coastal land, protected embayments, and probability of hurricanes. Although a few entrepreneurs, and some governmental and academic institutions, have attempted aquaculture over the last several decades, a final, positive, chapter for aquaculture development throughout the region is yet to be written.

During the first three decades of GCFI, aquaculture was minimally represented at the annual Institutes (1 – 5 papers), probably because aquaculture was a nascent industry in the western hemisphere, and the focus of GCFI was on developing management strategies for once abundant fisheries resources (Figure 1). The first recorded presentation devoted to aquaculture was at the 4<sup>th</sup> Institute describing a project funded by the Food and Agriculture

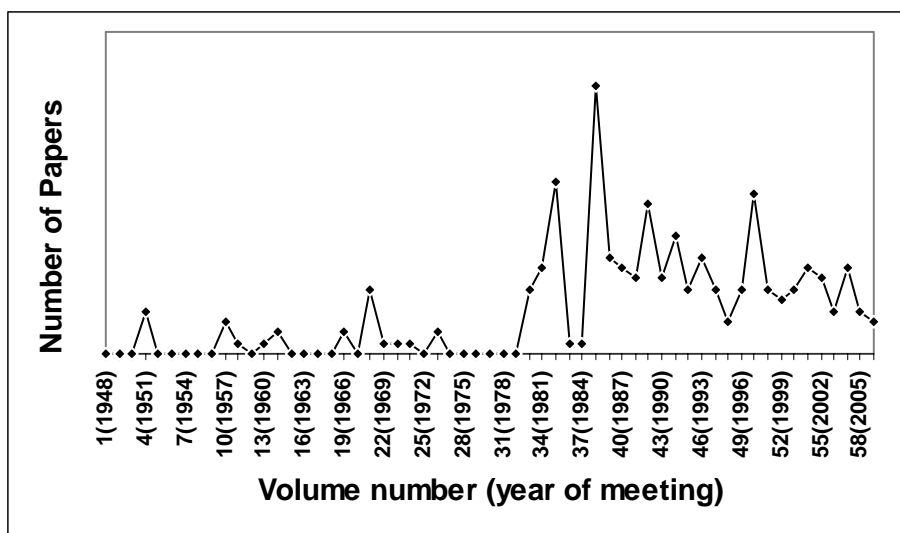
Organization of the United Nations (FAO) to introduce Chinese carp and *Tilapia* culture to Haiti (Lin 1952), and in subsequent years a smattering of aquaculture topics, primarily shrimp and oysters (10<sup>th</sup>, 14<sup>th</sup>, 21<sup>st</sup>, and 23<sup>rd</sup>, for a total of seven). Surprisingly, during the first 30 years of GCFI, only five papers were dedicated to marine finfish aquaculture. Aquaculture began to make the scene at GCFI in 1979, at the 33<sup>rd</sup> Institute in San Jose, Costa Rica, after a long hiatus (four papers in 10 years). During that Institute, C. Richard Robins (University of Miami) expressed the need for an “international experimental center for tropical aquaculture in Latin America (Robins 1981). Five other papers related to aquaculture were presented in San Jose, including oyster culture, the potential for fish culture in Costa Rica, arguably the first paper on queen conch mariculture (Goodwin 1981), and the first open forum dedicated to the development of aquaculture in the region (Schafer 1981).

A study of the history of GCFI during the first 30 years offers a few contributory factors to the increased interest in aquaculture at this time:

- i) Increasing demand for seafood products, particularly to U.S. markets, accompanied with advances in seafood processing technology and transport,
- ii) Decreasing supply of fishery resources, queen conch being a particular concern early on,
- iii) Limited access of U.S. seafood interests to fishing grounds due to enactment of transnational agreements (e.g. Law of the Sea, Exclusive Economic Zones), and
- iv) Advancements in aquaculture research and development, corporate interests.

Aquaculture was beginning to play a role in GCFI discussions, but it continued a fluctuating role, one that was usually tied to the host country for the Institute (and their particular aquaculture/fishery interests and professional community). The 35<sup>th</sup> Institute, held in Nassau, Bahamas, had 16 aquaculture presentations, most of them dedicated to queen conch mariculture for stock enhancement, an interest that would remain up to this writing. Sparked by declining conch stocks, Dr. Goodwin’s forward-looking presentation a few years earlier, and a network of researchers brought together by the Wallace Groves Foundation, in Freeport, Bahamas, conch mariculture established its presence in the GCFI forum, where it has resided ever since.

Although the next few Institutes (36<sup>th</sup> and 37<sup>th</sup>) were lack-luster regarding aquaculture (one per Institute), a defining event came to pass through the efforts of several GCFI members. The Caribbean Aquaculture Association (CAA) was established in 1983 at the University of Puerto Rico, and at one time had 240 members from 38 countries. Its first meeting was held at the 38<sup>th</sup> GCFI in Trois-Ilet, Martinique; as I recall it was convened in the early morning in the disco of the Meridian Hotel. To this day I am not sure how many of CAA’s founding members were not leftovers from the late-night revelry. At any rate, the association held its annual business meetings at each Gulf and Caribbean Institute, and it organized the aquaculture technical sessions for each Institute. CAA continued that role until its dissolution, which largely coincided with the establishment of the Latin American Chapter of the World Aquaculture Society. In fact, the WAS Latin America Chapter convened their triennial conference concurrent with this Institute of GCFI in Punta Cana.



**Figure 1.** Aquaculture related papers published in the Proceedings of the Gulf and Caribbean Fisheries institute from 1948-2006.

The number of aquaculture presentations and the species of interest was largely reflected in the venue of the Institute. For example, the 38<sup>th</sup> Institute (1986), held in Martinique had 33 presentations, almost exclusively devoted to marine fish cage culture, as a result of the efforts of IFREMER and the Association for Aquaculture Development in Martinique (ADAM). The primary focus was cage culture of tilapia, sea bass (*Dicentrarchus labrax*), and red drum (*Sciaenops ocellatus*), as well as the freshwater prawn, *Macrobrachium rosenbergii*, which was gaining interests, particularly in the French West Indies.

For the next few years, tilapia was a special interest at the institute, at the 42<sup>nd</sup> Institute (1987) in Ocho Rios, Jamaica, due to its well-established freshwater tilapia industry (sponsored by Grace Kennedy & Co.—a leading producers, and the Jamaica Cooperative Union), and later at the 44<sup>th</sup> (1989) in Nassau, Bahamas where the Caribbean Marine Research Center was continuing its work on saltwater tilapia production. Also at the 42<sup>nd</sup> in Ocho Rios, were several papers dedicated to oyster culture (*Crassostrea rhizophorae*), largely due to a successful economic development program supported by the International Research and Development Centre, Ottawa, Canada.

Surprisingly, only a smattering of presentations over the years has been devoted to crustacean culture, the noticeable absent of penaeid shrimp from the mix likely to the rapid establishment of a highly proprietary (and profitable industry) which was occurring mainly in Central and South America rather than the insular Caribbean. The Caribbean King Crab (a marketing name for the West Indian Red Spider Crab, *Mithrax spinosissimus*, enjoyed its brief moment in the sun during the last few years of the 1980s, with seven presentations at the 39<sup>th</sup> Institute in Hamilton Bermuda (eight presentations). Despite substantial funding and research efforts conducted by at several locations by a host of academic institutions and government laboratories, the life history of the crab was not amenable to intensive cage or tank culture (although some may argue that there is still potential for this species - but you didn't hear that from me).

Of all the species that have been investigated, evaluated, and research during the history of GCFI, it is the queen conch. Culture of *Strombus gigas*, initially to restore depleted stocks and later for commercial production, has had enduring interest throughout the region for several decades, beginning with the 35<sup>th</sup> GCFI (Bahamas, 1982) and continuing at those institutes hosted by Mexico (45<sup>th</sup>, 50<sup>th</sup>, 55<sup>th</sup>), where significant contributions have been made by CINVESTAV, universities, governmental agencies, and private interests. For many Institutes, beginning in earnest in Nassau at the 44<sup>th</sup>, conch has been the subject of its own technical program (combining fisheries and culture). No fewer than five presentations on conch biology and culture have been presented over the years, most notably at the 55<sup>th</sup> GCFI (Xel-Há, México - 2002), with a special publication of the session (Aldana

Aranda 2003).

Despite the economic importance of the spiny lobster fishery for the region, there have been few presentation regarding its cultivation, largely due to its complex and protracted larval period. However in recent years, there has been a renewed interest in spiny lobster culture based on collection of wild puerulii (Jeffs and Davis 2003). Despite recent encouraging results collecting post-larval lobsters from open-ocean fish cages, development of growout facilities, nutrition, and the inevitable political ramifications resulting from competition with fishers (at least a perceived conflict) will need to be resolved.

Aquaculture will continue to play a role in the annual Institutes of GCFI, albeit limited due to the more focused forum provided by the World Aquaculture Society - Latin America Chapter. Nonetheless, the growth or decline in interest for aquaculture research and development throughout the Caribbean will be a function of the health of our natural marine resources, advances in our knowledge of aquatic animal husbandry and culture technology, and the vagaries of marketing and economics.

#### LITERATURE CITED

- Aiken, D. and S. Waddy (eds.). 1991. Aquaculture in the Caribbean: Special Issue. *World Aquaculture* 22(1). 103 pp.
- Aldana Aranda, D. (ed.). 2003. *El Caracol Strombus gigas: Conocimiento Integral para su Manejo Sustentable en el Caribe*. CYTED, Mérida, México. 165 pp.
- Goodwin, M. 1981. Status of conch mariculture as a management tool in the Grenadines. *Proceedings of the Gulf and Caribbean Fisheries Institute* 33:22-29.
- Hargreaves, J.A. and D.E. Alston (eds.) 1991. *Status and Potential of Aquaculture in the Caribbean*. World Aquaculture Society, Baton Rouge, Louisiana USA. 274 pp.
- Jeffs, A. and M. Davis. 2003. An assessment of the aquaculture potential of the Caribbean spiny lobster, *Panulirus argus*. *Proceedings of the Gulf and Caribbean Fisheries Institute* 54:413-426.
- Lin, S.Y. 1952. Fish culture project in Haiti. *Proceedings of the Gulf and Caribbean Fisheries Institute* 4:110-118.
- Robins, C.R. 1981. The need for an international experimental center for tropical aquaculture in Latin America. *Proceedings of the Gulf and Caribbean Fisheries Institute* 22:30-33.
- Ryther, J.H., R.L. Creswell, and D.E. Alston. 1991. Historical Overview: Aquaculture in the Caribbean. Pages 9 – 29 in: J.A. Hargreaves and D.E. Alston (eds.) *Status and Potential of Aquaculture in the Caribbean*. World Aquaculture Society, Baton Rouge, Louisiana USA.
- Schafer, H.J. 1981. Informe del panel de evaluación sobre acuicultura. *Proceedings of the Gulf and Caribbean Fisheries Institute* 33:34.