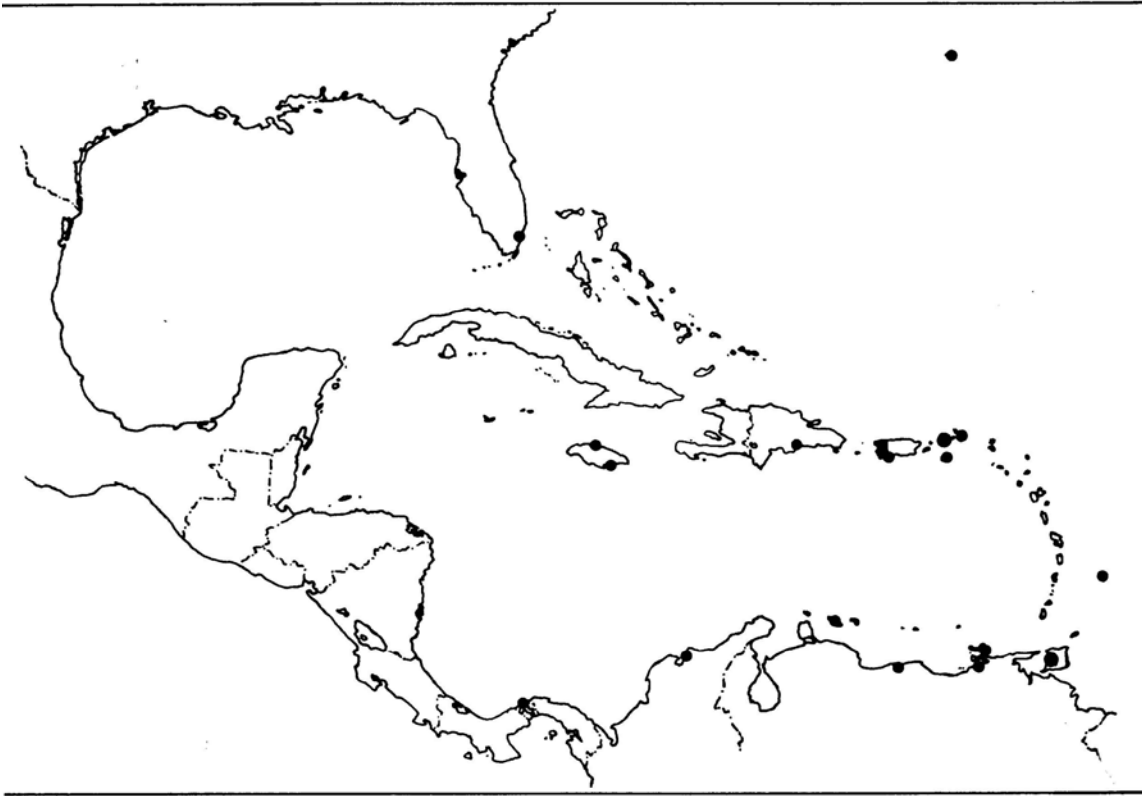


ASSOCIATION OF ISLAND MARINE LABORATORIES OF THE CARIBBEAN

TWENTIETH MEETING



INSTITUTO DE INVESTIGACIONES MARINAS DE
PUNTA DE BETÍN

Santa Marta, Colombia

11-14 August 1987

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⁴Abstract circulated, but paper was not presented

INTRODUCTION

The twentieth scientific meeting of the Association of Island Marine Laboratories of the Caribbean was hosted the Instituto de Investigaciones Marinas de Punta de Betín, Santa Marta, Colombia, from 10 to 14 August 1987. Members were welcomed to the meeting with an inauguration at the “Quinta de San Pedro Alejandrino,” Santa Marta, by Dr. Juan Federico Bateman Pinedo, governor of the State of Magdalena; Dr. Honorio Diez Granados Noguera, Mayor of the City of Santa Marta; Dr. Ivan Rey Carrasco, Representative of the Director General of COLCIENCIAS (the Colombian organization for the advancement of science) and Dr. Hernando Sanchez Moreno, Director of INVEMAR. A cocktail party followed the inauguration. The next afternoon the scientific sessions were opened by the President of the Association, Hernando Sanchez. Twenty-two papers were presented during three sessions for the next one and one-half days. After the close of the scientific sessions, on the morning of 13 August, participants were invited to skin and scuba dive off the R/V Tortuga II, a vessel of the marine laboratory; or to a terrestrial field trip of local attractions. The meetings were closed on 14 August with an evening entertainment with cocktails and excellent native food, and a band performing traditional and modern Colombian music.

A meeting of the Executive Board was conducted on the evening of 11 August at “Club 25” in Santa Marta where cocktails and an elaborate array of excellent seafood was served to Board Members:

Hernando Sanchez – President	John Cubit - Panama
Meredith Jones – 1 st Vice President	John Kubaryk – Puerto Rico (DMS)
Kumar Mahadevan – 2 nd Vice President	Judy Lang – Jamaica (DBML)
Bert Williams – Secretary-Treasurer	Jim Parrish – Puerto Rico (CEER)
Arturo Acero – 1 st Member-at-Large	Mel Carriker (Observer)

Charlene sent a report that the History Committee was continuing a series of interviews with long-term AIMLC members. Lucy Williams (Communications Committee) sent a report recommending Joe Kimmel, Fishery Research Laboratory (PR), as Editor of the Newsletter. Kumar Mahadevan volunteered to resolve the Logo Contest at the Sarasota Meeting. The progress of the UNESCO Committee was summarized by Bert Williams from recent conversations with John Ogden, St. Croix. The Modem Committee of Jose Lopez, Center for Energy and Environmental Research (PR), submitted no report. The List Committee’s (Charlene Long) efforts were approved by the Board as a List of Suggestions to be sent to meeting organizers. A new Institutional-Laboratory Member, the College Center of the Finger Lakes Bahamian Field Station, Dr. Donald T. Gerace, Director, was invited to AIMLC Membership. Meeting sites and dates approved during previous meetings were carried over without additions:

Mote Marine Laboratory	Sarasota, Florida, USA	24-27 May 1988
Department of Marine Sciences	Mayagüez, Puerto Rico	15-18 May 1989
Smithsonian Tropical Research Institute	Panama	1990

The possibility of a joint Puerto Rico-AIMLC hosting of the International Coral Reef Symposium in 1992 was endorsed by the Board. Field trips at each Association Member Laboratory were suggested. Individual dues were increased from \$3 to \$10 (\$5 for students). The Board decided that two or more issues of the Newsletter and a volume of the Proceedings could not be provided for less money. Institutional Dues were raised from \$50 to \$100. The Board approved the addition of Business or Industrial Members as non-voting Board Members. Dues and contributions from these organizations would allow additional AIMLC activities. An outside telephone connection and computer modem hook-up were approved for our Business Office. The possibility of Cooperative Agreements with other organizations was approved (Bert Williams will continue communications with the Gulf and Caribbean Fisheries Institute, John Kubaryk with the Southern Association of Marine Laboratories, and Judy Lang with a geophysical organization).

The Business meeting was opened the morning of 15 August with an address by Hernando Sanchez. President Sanchez appointed Joe Kimmel Editor of our Newsletter and Paul Yoshioka Editor of our Proceedings, and made these new positions non-voting officers of the Executive Board. He created a temporary (elected) Executive Director position on the Board pending the revision of the Bylaws. The President instructed Bert Williams to present the reports, conduct the elections, and to preside over the remainder of the meeting. The following officers were nominated and elected:

PRESIDENT: Kumar Mahadevan	SECRETARY-TREASURER: Lucy Williams
EXECUTIVE DIRECTOR: Bert Williams	1 ST MEMBER-AT-LARGE: Arturo Acero
1 ST VICE PRESIDENT: Meredith Jones	2 ND MEMBER-AT-LARGE: Karen Burns
2 ND VICE PRESIDENT: Manuel Hernandez	3 RD MEMBER-AT-LARGE: Mel Carriker

New business included a question by Juan J. A. Laverde Castillo about requests for research information to the Association. Bert explained that he refers requests to specialists. Mel Carriker suggested a computer list of scientists in the AIMLC and their specialties. A "Best Student Paper" award of \$50 was suggested by Mel and John Kubaryk. Gustavo Ramirez asked if papers from this meeting would be published. Bert noted that only abstracts would be published in the Proceedings. However, Arturo Acero added that full-length papers from the meeting would be published locally (deadline for manuscripts in mid-October). Mel asked if our abstracts are listed in international indexes. Bert noted that the abstracts are technically not publications and that only two specialty indexes have agreed to include our abstracts. Francisco A. Arias Isaza, Jefe Division de Investigaciones, Centro de Investigaciones Oceanograficas e Hidrograficas, Cartagena, Colombia, presented information about his laboratory (a potential new Institutional Member) and invited everyone on a tour of one of their research vessels, at dock in Santa Marta, immediately following the meeting (it was very impressive). Adriana Santos Martinez asked if we have a recorded history of the AIMLC. Bert explained that he and Charlene Long are working on one. She also wanted to know if there have been any cooperative projects between labs. Bert noted several labs with shar-

ed projects in the past and the recent CARICOM Proposal. Gustavo Ramirez suggested contributions by all labs to a travel fund for AIMLC participation. John Cubit suggested U.S. National Science Foundation money is available for some student travel. Bert noted the last NSF funding we were able to obtain was for the 1977 meeting (also in Santa Marta). John Kubaryk reminded Arturo of the \$250 in student travel funds for each lab following their hosting of a meeting. The President appointed the following committees (Chairperson listed first):

HISTORY – Charlene Long, Bert Williams

COMMUNICATION – Joe Kimmel, Kumar Mahadevan, Ray Hayes, Lucy Williams

CARICOM – John Ogden, Gerardo Gonzalez

BYLAWS – Meredith Jones, Bert Williams, Charlene Long

LOGO – Kumar Mahadevan, Karen Burns

BROCHURE – Kumar Mahadevan, Karen Burns

INDEX OF SPECIALTIES LISTING – Mel Carriker

STUDENT PAPER AWARD – John Kubaryk, Mel Carriker

NSF STUDENT TRAVEL – John Cubit, John Kubaryk, Bert Williams

Meredith Jones closed the meeting with acknowledgments in Spanish. The Association is deeply appreciative to Hernando Sanchez, Arturo Acero, Juan Diaz, and other members of INVEMAR and COLCIENCIAS, who made the 20th scientific meeting of the AIMLC so enjoyable and successful.

AFTER MEETING INFORMATION

Dr. Robert I. Wicklund's Caribbean Marine Research Laboratory in Lee Stocking Island, Bahamas, has been accepted to AIMLC Institutional Membership as our 24th laboratory. Our five year tentative scientific meeting schedule remains the same as listed above for the first three years (Florida, 1988; Puerto Rico, 1989; Panama, 1990), but adds the Bahamas in 1991, and Colombia in 1992. The plans for a Coral Reef Symposium meeting proposal have been delayed until 1996. Two new committees have been added: DIVE – George Mitcheson (exploring the possibility of standardizing checkout requirements and training among our labs), and LABORATORY INFORMATION – Lucy Williams (a publication explaining what, where, who, and how much about our labs).

VARIACIÒN ESTACIONAL DE FACTORES HIDROQUÍMICOS EN LA ZONA COSTERA DE REGIÒN DE SANTA MARTA

Gustavo Ramirez T.
INVEMAR, Apartado 1016, Santa Marta, Colombia

La region de Santa Marta ha venido desarrollándose desde tiempo atrás principalmente como zona turística en el Caribe colombiano. Sin embargo, considerando el desarrollo futuro de la region el INVEMAR inició en 1980 la caracterización hidroquímica de las aguas costeras de su área de influencia, en donde se han identificado a grandes rasgos tres zonas con características hidrológicas definidas: (a) La Ciènaga Grande de Santa Marta (450 km²), que conforma la mayor laguna costera de Colombia y el principal recurso pesquero del Caribe colombiano. Sue características hidrológicas son complejas como consecuencia de la combinación de varios factores externos; a saber, su interrelación con la parte baja del Río Magdalena, aportes fluviales de la Sierra Nevada de Santa Marta y comunicación directa con el Mar Caribe, además de los factores meteorológicos. (b) El sector costero comprendido entre la Ciènaga Grande y la Bahía de Santa Marta, donde se localizan las actividades urbano-industriales de la región. Se puede considerar como una zona de transición sometida a la influencia continental de la Ciènaga misma y a la oceánica del Mar Caribe con relative variación de los parámetros hidrológicos. (c) El Parque Nacional Tayrona, que enmarca el mayor número de ensenadas del Caribe colombiano, de características homogéneas y oceánicas durante la mayor parte del año y representa un ecosistema marino todavía poco intervenido por actividades humanas.

CONDICIÒN BACTERIOLÒGICA DE LA OSTRA DEL MANGLAR (*CRASSOSTREA RHIZOPHORAE* [GUILDING, 1828]) EN LA CIÈNAGA GRANDE DE SANTA MARTA

Alfonso Escobar Nieves
INVEMAR, Apartado 1016, Santa Marta, Colombia

Entre junio de 1985 y marzo de 1986 se investigò la calidad bacteriològica de 20 muestras de la ostra del manglar (*Crassostrea rhizophorae*) procedentes de dos areas de crecimiento localizadas en la Ciènaga Grande de Santa Marta. Se encontrò que tanto en las areas contaminadas como en la no contaminadas los niveles de contaminación fecal presentes en la ostra llegan a superar los niveles establecidos por las normas internacionales, constituyendo potencialmente un alto riesgo para el consume humano. La condición no satisfactoria de los bivalves es producto del vertimiento continuo de aguas residuales domèsticas procedentes de los núcleos poblacionales ribereños y las areas de cuenca.

BIOLOGICAL EFFECTS OF AN OIL SPILL ON THE CARIBBEAN COAST OF PANAMA

John D. Cubit, Stephen Garrity, Jeremy B. C. Jackson, Jeff M. Burgett,
Ricardo C. Thompson, Hugh M. Caffey, Ernesto Weil and Michael Marshall
Smithsonian Tropical Research Institute, Apartado 2072, Balboa, Panama

In April 1986, 240 000 barrels of medium weight crude oil spilled from a ruptured storage tank at Bahía Las Minas, on the central Caribbean coast of Panama. More than 50 000 barrels of oil immediately washed into an area of coral reefs and mangrove forests, including the biological reserve of the Smithsonian Tropical Research Institute at Punta Galeta. Numerous previous studies of the area provided extensive baseline information for investigating the effect of the oil spill. In subtidal habitats at heavily oiled sites, patches of recently dead and decomposing tissue were found on up to 30% of the *Siderastrea siderea* colonies; at unoiled sites no such damage was found. On the emergent reef flat at Punta Galeta, the mortality of algae and sessile invertebrates was highest near the seaward edge of the flat, where the oil accumulated during low tides. Initial mortality of mangrove trees was concentrated along the seaward berm of windward shores. Where the prop roots of the Red Mangrove, *Rhizophora mangle*, were coated with oil, oysters, mussels, and other sessile organisms of the prop-root communities were reduced in abundance. After the oil spill, blooms of filamentous microalgae occurred at the edge of the reef flat and in some habitats on mangrove roots. Within a year after the oil spill, faster-growing organisms, such as barnacles and perennial algae had recolonized some heavily oiled sites, but slower-growing species, such as corals, had not recovered. Studies are underway to examine longer-term changes and recovery of marine communities as well as the chronic effects of oil, which continues to escape from entrapments in the mangroves and to seep from the porous landfill where the spill occurred.

MEDICIONES ÒPTICAS DE CONCENTRACIONES DE MATERIAL SUSPENDIDO: PROBLEMAS CON SU VERIFICACIÒN

Klaus Ohm
INVEMAR, Apartado 1016, Santa Marta, Colombia

La concentración de las partículas transportadas en aguas de un estuario varía enormemente con la posición y el tiempo. Por esa razón se necesita una sucesión densa de puntos de medición suficiente, particularmente investigando transportes de materiales suspendidos. Eso puede realizarse favorablemente con instrumentos ópticos. Se presenta la estructura óptica de un aparato clásico para medir la atenuación que tiene luz paralela en el espacio a medir. El coeficiente de atenuación c , que se compone de la absorción y dispersión, se calcula a partir del flujo de radiación transmitido F_t según la ecuación: $c = (-\ln(F_t/F_o))/L$, donde L es la longitud del espacio a medir. El análisis detallado del recorrido del rayo luminoso, muestra que el valor determinado de c en principio es más peque-

ño que el verdadero. Se puede estimar la calidad òptica del aparato mediante una medic-
iòn de referencia llevada a cabo con el standard de turbidez "Formazin." Pero dicho error
de medicìon es màs pequeño que el causado por cambios desconocidos en la distribuciòn
de magnitud de las partículas. La concentraciòn de material K y el coeficiente de
atenuaciòn c son directamente proporcionales: $K = e.c$, pero el factor e depende mucho en
la magnitud de las partículas. Para conseguir medidas màs confiables, pero sin aumen-
tar esencialmente los costos, se propone medir el flujo de radiaciòn dispersada en un
àngulo fijo.

ENTRADA Y TRANSPORTE DE METALES TRAZAE CON EL MATERIAL SUSPENDIDO EN LA CIÈNAGA GRANDE DE SANTA MARTA

Néstor Hernando Campos
INVEMAR, Apartado 1016, Santa Marta, Colombia

En el periodo comprendido entre mayo de 1985 y febrero de 1986, y con inter-
valos de 3 meses, se recolectò material suspendido con trampas diseñadas especialmente
para tal fin, en 9 estaciones en la Ciènaga Grande de Santa Marta. En las muestras
recolectadas se determine la cantidad de material suspendido que està entrando por los
diferentes rios y areas de intercambio a la ciènaga y la concentraciòn de los metales
cadmio, cobre, zinc y manganeso. Las mayores concentraciones de material suspendido
en g/l se midieron en el Rincòn del Jaguey y la mayor entrada se realize a travès de los
rios que fluyen de la Sierra Nevada de Santa Marta. Al determinar la composiciòn en
porcentaje de la materia orgànica, se determinò, que menor porcentaje lo presentan las
muestras del Rincòn del Jaguey, mientras que las mayores se determinaron en las muestras
de la boca del Caño Grande y los màs constantes para los 4 muestreos se presentaron en
las estaciones localizadas en las bocas de los rios que vienen de la Sierra Nevada de Santa
Marta. Para Cd se observò la mayor concentraciòn en muestras de la boca del Canal del
Clarín, que conduce agua del Río Magdalena. Para Zn se observo que entrada se sucede
por varias vias, lo demuestra las mayores concentraciones medidas en las muestras de la
boca Canal del Clarín, de los rios Sevilla y Aracataca. Para Cu, como en el caso de los
anteriores, la principal via de entrada es el Canal del Clarín y a travès de los rios Sevilla y
Aracataca, en valor màs alto se midiò en el material del ùltimo muestreo en la estacion
del centro. Para Mn la descarga se realize principalmente a travès de los rios que vienen
de la Sierra Nevada. Se relacionan las concentraciones de metales con la cantidad de
material suspendido y el porcentaje de materia orgànica.

DESARROLLO Y CONSTRUCCIÓN DE UNA SONDA

Eliseo Pèrez M.

INVEMAR, Apartado 1016, Santa Marta, Colombia

Es de suma importancia en areas de la biología marina tales como la biología aplicada, experimental y en estudios ecológicos el poder determinar de manera útil, no aislada y confiable parámetros físico-químicos del lugar de investigación (estuaries o aguas someras). Para satisfacer estas necesidades se está llevando a cabo un proyecto para la construcción de una multisonda en el INVEMAR, con tecnologías accesibles gracias a un modelo diseñado en el Instituto Alfred Wegener (Alemania) por el grupo del físico Klaus Ohm quien se encuentra prestando asistencia para transferir las tecnologías y conocimientos necesarios. El modelo pasee características acordes con su aplicación, la biología marina, así: La sonda emplea alimentación por red de 110 VAC o por baterías. Posibilidad de medir varios parámetros al mismo tiempo, máx 10. Se pueden adaptar detectores de diferentes firmas. Los datos se pueden almacenar y procesar en micro-computadores. Posee una precisión de 0.1% útil en aguas somera o estuarios. Su construcción es modular lo que permite un funcionamiento más constante. Por lo tanto, en la primera fase del proyecto, un año, se busca fortalecer la infraestructura del INVEMAR en el campo de la instrumentación aplicada y al mismo tiempo instalar una sonda como estación fija en la bahía de Santa Marta para registrar tres parámetros: Conductividad, Temperatura y Oxígeno. CTO.

APPLICATIONS OF ADVANCED VERY HIGH RESOLUTION SATELLITE DATA FOR TROPICAL OCEANOGRAPHY

Linda L. Riggs and Roy A. Armstrong

Department of Marine Sciences, University of Puerto Rico, Mayagüez, Puerto Rico

With the demise of the Coastal Zone Color Scanner on the Nimbus-7 satellite, there is only one operational sensor useful in oceanographic research, the Advanced Very High Resolution Radiometer (AVHRR) on NOAA-n polar orbiter platforms. One of AVHRR's principal uses has been the calculation of sea surface temperature (SST) fields primarily using a Multi-channel Sea Surface Temperature algorithm (MCSST). Unfortunately, the MCSST and other algorithms are of limited use in tropical areas where the interference by a warm, humid atmosphere severely affects satellite thermal infra-red sensing. Four AVHRR scenes for Puerto Rico and the eastern Caribbean were processed using MCSST for 10 October and 8 November 1985 and 10 and 18 April 1987. The derived SSTs for the fall scenes were approximately 1-2° C cooler than field-measured SSTs taken during that time frame. The satellite-derived spring SSTs were completely masked by the atmosphere. Highly turbid areas and phytoplankton blooms can be detected with band ratios and vegetation indices from AVHRR channels 1-2 or by using CAUSE, a classifier that results in 14 land and water classes. These techniques are limit-

ed to coastal areas with high suspended sediment and chlorophyll values. The most promising applications of AVHRR data in tropical oligotrophic seas will be the derivation of SST fields once a suitable algorithm is developed. After correcting for the masking effects of a warm, humid atmosphere, the spatial/temporal dynamics of upwelling areas and eddies should be detectable by their surface thermal signatures.

TWO LARGE, PREDATORY JACKS (CARANGIDAE) OF TROPICAL, SHALLOW-WATER MARINE COMMUNITIES: LIFE HISTORY AND ECOLOGY

Antony E. Sudekum¹, James D. Parrish¹, Richard L. Radtke² and Stephen Ralston³
¹Hawaii Cooperative Research Unit, University of Hawaii, Honolulu; ²Hawaii Institute of Marine Biology, UH, Kaneohe; ³SW Fisheries Center, NMFS, NOAA, Honolulu, Hawaii

Caranx melampugus and *Caranz ignobilis* are large, circumtropical jacks that are often important as common, high-level predators in shallow, marine fish communities. For this study, both species were collected rather widely in the northwestern Hawaiian Islands. Age was estimated from daily increments in otoliths, which were validated by marking captive specimens with tetracycline. The resulting growth patterns fit the von Bertalanffy growth model reasonably well. Both species showed spawning peaks in late spring and summer. Size at first reproduction was about 350 mm standard length (SL) for *C. melampugus* and about 600 mm SL for *C. ignobilis*. Fecundity for *C. melampugus* ranged from about 50 000 ova at 328 mm SL to about 4.3 million ova at 640 mm. Fishes provided almost the entire diet of *C. melampugus*. The diet of *C. ignobilis* was composed of more than 90% fishes, but also included cephalopods and crustaceans. Captive specimens were fed *ad libitum* to estimate the maximum feeding rate in nature. The rates indicated that these are important top, piscivore predators in the marine community.

DETERMINACION DE LA POBLACION DE BALLENAS JOROBADAS *MEGAPTERA NOVAEANGLIAE* DE LA ISLA GORGONA, PACIFICO COLOMBIANO

Luis F. Constain-Franco¹ and Lilian Flórez-Gonzalez²
¹Apartado 27984 and ²Museo del Mar, Univ. Jorge Tadeo Lozano, Bogotá, Colombia

Durante el tiempo comprendido entre agosto y noviembre de 1986, se efectuò un seguimiento de las ballenas jorobadas, *Megaptera novaeangliae* (Borowski, 1781), encontradas en los alrededores de la Isla Gorgona, con el fin de determinar su procedencia. Para tal propòsito se recurriò a la grabacòn de los cantos los cuales son usados como indicadores de grupos de poblaciones. Igualmente se tomaron fotografias que permiten identificar a los individuos a partir de cicatrices, crecimientos externos y patrones de pigmentacòn de la regiòn ventral de la aleta caudal. Los resultados de esta primera fase indican que los 30 individuos encontrados en el àrea, conforman un grupo proveniente de la poblacòn del hemisferio sur.

DISTRIBUCIÒN DE *MUGIL CUREMA* EN LA DE REGIÒN SANTA MARTA

Carlos R. Flòrez
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Entre los meses de julio 1985 y agosto 1986, se determinò la distribuciòn de individuos juveniles y adultos de *Mugil curema* Valenciennes, 1836 (Pisces: Mugilidae) en la regiòn de Santa Marta que incluye la franja marina costera desde la bahía de Santa Marta hasta la desembocadura de la Ciènaga Grande en la Boca de la Barra, y la zona netamente estuarina de la misma Ciènaga. Los sitios de muestreos se ubicaron en las bahías de Santa Marta y Rodadero, laguna de Plenomar, playas de Plenomar y Aeropuerto, boca del estuario y estuario propiamente dicho. Se tomaron los valores de salinidad superficial del agua como indicadores de las fluctuaciones del regimen pluviomètrico en la regiòn, y del consecuente aporte de materia organica a los sitios de muestreos mencionados por parte de sus ríos tributarios. Se encontrò que los individuos juveniles prefieren aguas turbias y de baja salinidad, donde se encuentran organismos dulceacuicolas en los que estos individuos basan su dieta. Por su parte los adultos mostraron una preferencia por aguas claras de salinidad relativamente alta.

ASPECTOS FITOGEOGRÁFICOS DEL MANGLAR DEL PARQUE NACIONAL NATURAL LOS CORALES DEL ROSARIO (BOLIVAR) COLOMBIA

Carlos A. Bohòrquez R. and Martha C. Prada T.
Calle 2B 30A-31, Bogotá, Colombia

Los manglares del Parque Nacional Natural los Corales del Rosario, se hallan distribuidos en su mayoria al sur (sotavento), frecuentemente asociados a las lagunas costeras, ello se debe al efecto del relieve el cual es el resultado de la historia geofísica influenciada por los efectos de los procesos geomòrficos los cuales estàn influenciados a su vez por los vientos alisios. Cubren 297.2 ha, localizada la mayor extensiòn en Isla Barù, entre los años 1961 y 1985 se encontrò una disminuciòn del manglar de 51.6 ha (18%), debido a impactos ocasionados por los habitantes del área principalmente por la tala con fines comerciales o de obtenciòn de espacio para construcciòn. Las superficies vegetales se hallan en un estado de equilibrio tanto en su movimiento direccional como en su persistencia.

ESTRUCTURA Y DINÀMICA DE UNA COMUNIDAD MACROALGAL DE UN PLANO ARENOSO

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Se realizaron observaciones estacionales durante un año y medio sobre la naturaleza y dinàmica cuantitativa de una comunidad de macroalgas localizads en el Parque Nacional Tairona a 22 m de profundidad en un fondo plano arenoso. El nùmero de especies, la biomasa y la cobertura fueron mucho màs altas durante las condiciones de afloramiento (estaciòn seca mayor: enero-abril) que en las del "outwelling" del Rio Magdalena (estaciòn lluviosa mayor: septiembre-noviembre). Sin embargo, el indice de diversidad de Shannon-Weaver y la equitabilidad fueron màs altos en esta ùltima condiciòn climàtica. El modelo de dominancia-diversidad, el alto nùmero de especies (83) y su mantenimiento, las formas de vida, y la alta estabilidad de ajuste de la comunidad, se deben probablemente a la estabilidad (sensu Slobodkin y Sanders, 1969) de las condiciones ambientales y a las condiciones físicas perturbadoras causadas por el outwelling del Rio Magdalena. Se considera aqui que la temperatura es el factor màs importante gobernando la producciòn macroalgal.

SIZE DISTRIBUTION OF THE YELLOWTAIL SNAPPER, *OCYURUS CHRYSURUS* (BLOCH), CAUGHT BY VARIOUS FISHING GEARS

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The Yellowtail Snapper, *Ocyurus chrysurus* (commonly known as colirubia or rabirubia in Spanish) is a commercially important fish species in Puerto Rico and throughout its range. The most widely used gears reported for the Puerto Rico commercial fishery of the Yellowtail Snapper (by weight) are hook-and-line and fish traps. However, the Yellowtail Snapper is also caught by gill nets, trammel nets, beach seines, spear, trolling and jigging. A total of 2344 fish were sampled over a 12 month period and 35% were caught by beach seine, 26% by fish traps, and 21% by hook-and-line. These gears used to catch this fish are deployed at different depths and probably sample fish of different sizes. Preliminary results show mean sizes of fish caught by beach seine (207 +/-21 mm in fork length [FL]) to be smaller than those caught by fish traps (242 +/-16 mm FL) and hook-and-line (287 +/-19 mm FL). Results of the length-frequency distribution of Yellowtail Snapper caught commercially in Puerto Rico by various fishing gears will be presented.

PATTERNS OF SPONGE RECRUITMENT IN ROCKY AND CORAL-REEF HABITATS OF THE SANTA MARTA REGION, COLOMBIA

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That adult sponges or other sessile organisms are absent, rare, or abundant in a given habitat depends, in the first place, on the choice and ability of their larvae to settle and survive. Recruitment of juvenile and abundance of adult sponges are being compared at six habitat types along a rocky and coral reef profile in Santa Marta, Colombia. Black, 10 x 15 cm, acrylic plastic plates are being used as settlement surfaces. These are bolted to the bottom by wedge anchor screws inserted into holes made by a hand-held pneumatic drill driven by a SCUBA tank. Six plates were interspersed in a 4 m² area in each habitat, left to become "natural" for 60 days, retrieved to locate and count sponges in the laboratory, and returned to their places for an additional 60 days to estimate natural recruitment and mortality. A range of 1 to 33 sponges per plate recruited onto upper surfaces and 1 to 77 onto lower surfaces in a 60-day period. Per plate mortality, including both natural and handling, ranged between 17.7 and 100% of the initially recruited sponges. Natural recruitment onto upper surfaces was highest at the boulder vertical walls (4-5 m depth) at the rocky shore (22.2 +/-7.36 larvae/plate), and lowest at the big coral heads habitat (15 m) in the reef fringe (3.3 +/-1.75 larvae/plate). Quantitatively, the abundance of sponge adults follows the same pattern. Numbers of sponges that recruited onto 30 and 60 days old plates (2 sets, n=5) during a period of 1-2 days, were taken as actual settlement figures. These were 1.4 and 0.4 larvae/plate/day at 24 and 15 m, respectively. The mean mortality during this period, 10.0 to 16.6%, was taken as that due to handling. Quantitative studies of sponge cover are presently being carried out, as well as experiments to study the influence of filamentous algae and debris in sponge recruitment.

QUANTITATIVE STRUCTURE OF GORGONIAN COMMUNITIES IN TAYRONA PARK, SANTA MARTA, COLOMBIA

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This paper reports on the number of species (S), diversity (H' and J') and colony density (D) of gorgonian communities at different stations in bays and around islets of Tayrona National Park, Caribbean coast of Colombia. A total of 39 species of gorgonians were found in the study area distributed between 1 and 45 m depth. Maximum S at any one station was 23, and at any one depth zone within a station was 19. Lowest S at any one station was 14 and at any one depth zone was 4. H' ranged from 0.7 in the deepest zone (18-20 m) of Station 2, to 2.4 in Stations 1 and 9 (all zones pooled) and 2.3 at 10

to 11 and 12 to 14 m depth in Stations 1 and 5, respectively. Lowest J' (0.4) was found between 9-10 m depth at Station 2 and highest values (0.9) were found at 10 m depth in Station 1, and 29-35 m depth in Station 8. In general, stations with pronounced bottom slope (20-50°) had the highest S and H' between 12-18 m depth. Colony density varied at different defferent depth zones and different stations between 0.6 and 6.0 colonies/m². At stations with pronounced bottom slopes, D was highest between 3-9 m depth. Cluster analyses of species composition and frequency data in the 9 sampling stations grouped together stations with similar bottom slope, type and relief of substratum, depth and location (protected or exposed to strong wave action). When a depth gradient exists (slope 20-60°), gorgonian communities on protected sides of bays or islets are generally dominated by *Gorgonia ventalina* and *Plexaura flexuosa* between 8-15 m depth, *Muricea pinnata*, *M. elongata*, *M. laxa*, *Eunicea fusca* and *Icilogorgia schrammi* between 15-25 m, and azooxanthellate species, *Lophogorgia* spp., *Ellisella* spp. and *I. schrammi* below 25 m depth. On exposed sides of bays or inlets *Plexaurella grisea*, *P. dichotoma* and/or *Muricea atlantica* are the most abundant species.

NOTAS SOBRE ALGUNOS SERPÙLIDOS (POLYCHAETA: ANNELIDA) DE BAHÍA MÀLAGA, PACIFICO COLOMBIANO

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Se describen cinco especies de serpùlidos colectados en habitate someros de Bahía Málaga, siendo este su primer registro para el Pacífico colombiano. Se incluyen comentarios e ilustraciones sobre las características morfològicas empleadas en la identificaciones y datos sobre la ecología y distribución de estas especies.

COMPETATIVE RELATIONSHIPS AMONG SPECIES OF REEF CORALS

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Many reef corals utilize one or more mechanisms of direct or indirect competition. The temporal and spatial scales over which these various mechanisms are effective differ among species; moreover, each coral may be differentially affected by numerous intrinsic and environmental variables. As a result, the observable effects of competition between corals can vary, both temporally within a given interaction and spatially among the individual members of a population. Nevertheless, it should be possible to estimate the range and frequency of likely outcomes for any given two coral species in a particular

environment. Given these complexities, we doubt that competition between most pairs of species will prove to be strictly symmetrical or perfectly asymmetrical. Similarly, within most communities it seems unlikely that competitive relationships among species are either completely hierarchical or form simple, circular networks. Should adequate data become available, we anticipate that generally they would form complex, competitive networks, lacking single competitive dominants. The relative competitive rankings of many species would probably vary with habitat or geographic locality, due to attendant differences in the specific composition of the fauna or with other environmental variables.

CIRRIPEDIA (CRUSTACEA) DE LA ZONA INTERMAREAL E INFRALITORAL DE LA REGIÓN SANTA MARTA

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Con el fin de inventariar y reportar las especies de Cirripedia presentes en la Ciènaga Grande de Santa Marta y la bahía de Nenguange en el Parque Tayrona, se recolectaron periódicamente, entre 1985 y 1986, ejemplares de este grupo de crustáceos entre la zona intermareal y la infralitoral por medio de buceo autónomo y apnea. Para el Caribe colombiano habían sido reportadas hasta ahora 17 especies de Cirripedia, distribuidas desde Cartagena hasta la Guajira. De las 14 especies reportadas en el presente trabajo, se incluye un Lepodomorpha, *Octolasmis muelleri*, epibionte en las branquias del cangrejo nadador *Callinectes sapidus*; un Rhizocephala, *Loxothilacus texanus* parasitando cangrejos del género *Callinectes* y 12 Balanomorpha. Las dos primeras especies y 7 de las del grupo Balanomorpha son registros nuevos para el Caribe colombiano, elevándose así el número de especies descritas a 16.

NITROGEN FIXATION BY *MICROCOLEUS LYNGBYACEUS* MAT COMMUNITIES

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Diurnal and nocturnal rates of nitrogen fixation were measured in cyanobacterial mat communities that occur in the Parguera Channel. These mat communities consist predominantly of *Microcoleus lyngbyaceus*, a non-heterocystous blue-green algae and some bacterias. Rates of nitrogen fixation during nocturnal periods were significantly higher than diurnal periods. Since nitrogen is oxygen labile, we postulated that the low activity during diurnal periods may be due to higher oxygen tensions. This could be a result of oxygen evolution by means of photosynthetic processes. The addition of NH⁴ during the day did not affect nitrogen fixation, whereas ammonium addition during the night decreased nitrogen fixation activity.

POSIBLES ASPECTOS AFECTANDO LOS TRANSPLANTES Y EL CRECIMIENTO DE
RUPPIA MARITIMA EN EL SUROESTE DE PUERTO RICO

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Estudios concernientes a la ecología y otros aspectos de importancia de *Ruppia maritima* se llevaron a cabo en el area suroeste de Puerto Rico. Ha sido muy escaso el trabajo hecho en la Isla acerca de esta fanerogama marina. Aspectos de la distribución de *R. maritima* y su importancia como fuente de alimento para aves migratorias fueron presentados anteriormente. Unidades de transplante de *R. maritima* recolocaron en tres estaciones en el area de La Parguera (suroeste de P.R.); las estaciones seleccionadas son lugares de aguas llanas, tranquilas, con fondos suaves y con características adecuadas para proveer refugio a aves migratorias. Las condiciones de turbidez y la salinidad seran factores determinantes en el establecimiento de esta fanerogama marina. Se detectaron concentraciones de NH_4^+ , NO_3^- , NO_2^- y PO_4^{4-} en muestras de aguas intersticiales de dos lagunas costeras en el suroeste de la Isla. Dichas lagunas presentan marcadas diferencias en el tamaño promedio alcanzado por *R. maritima*. Las razones N:P encontradas son muy similares a las encontradas por Atkinson y Smith (1983) para hierbas marinas y microalgas benticas.

THE CURAÇAO UNDERWATER PARK: WHERE WE STAND
AFTER FOUR YEARS OF CORAL-REEF MANAGEMENT

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The Curaçao Underwater Park was officially inaugurated in 1983 by the Commissioner of Environmental Affairs. Facilities for visitors and the local public were established very quickly in an attempt to stimulate visibility to and acceptance by the public. The goals of the park management are: (1) Protection and conservation of a healthy reef environment, (2) stimulation of sustainable use for local and foreign tourists, (3) Creation of a conservationist philosophy in the public through education at all levels. After four years in existence, the Curaçao Underwater Park is well underway to meeting its goals; however, the work to preserve and protect the fragile coral reefs requires a continuing effort.

A CARIBBEAN CENTER OF AQUATIC ANIMAL HEALTH

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A regional Aquatic Animal Health Laboratory is being developed to provide diagnostic services, training, treatment and control measures, and research abilities, to solve the disease problems of marine and freshwater animals in Puerto Rico and the U.S. Virgin Islands. The lab is supported by the University of Puerto Rico, the Department of Natural Resources of the Commonwealth of Puerto Rico, Sea Grant of Puerto Rico and the U.S. Virgin Islands, the Caribbean Fisheries Management Council, and is also seeking support from the Division of Fish and Wildlife of the Government of the U.S. Virgin Islands. The CAAHL and the Fish Health Section of the International Center for Aquaculture at Auburn University are cooperating in a project to form a Caribbean Aquatic Animal Health Center to provide disease investigation services for freshwater and marine aquaculture projects in the Greater Caribbean Basin region. Large-scale, sometimes region-wide, aquatic animal health disturbances have either occurred for the first time, or have greatly enlarged their distribution and importance, in the last few years. These events may continue to expand in numbers and importance and forever alter the Caribbean environment. A concerted effort to solve or mitigate these problems is needed before a disaster ensues.