

## Felimon C. Gayanilo, Jr.

(Résumé as of June 2010)

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### **SUMMARY OF WORK EXPERIENCES**

- Over two decades of experience in software development and other Information Technology (IT) related functions in a multi-cultural and international setting.
- Lead software engineer/developer for the *Gulf of Mexico Coastal Ocean Observing System* (GCOOS; <http://gcoos.rsmas.miami.edu>) *Data Portal* that is nested in a *National Backbone* of coastal observations to aggregate and disseminate the region's near real-time oceanographic data in close collaboration with data providers from five states that borders the Gulf and the *National Data Buoy Center* (NDBC). Data are streamed from the sources on regular interval and processed in near real-time. These are served in OpenGIS Consortium (OGC) Sensor Observation Service (SOS) compliant using the latest schema developed by the *U.S. Integrate Ocean Observing System* (IOOS). Gayanilo is a member of the *Web Services and Data Exchange* (WSDE) working group of IOOS, responsible in the design and publication of the schema and other infrastructures related to the development of a common *Data Integration Framework* (DIF) to integrate and facilitate interoperability among coastal and ocean observing sensors.
- IT Specialist for the NOAA-funded MARES project (Marine and Estuarine Goal Setting for South Florida; <http://sofla-mares.org>) to design, develop and deploy data/communication portals to support the multi-agency collaborative project, and assist in the design and development of a semantic web application for the deployment of bioassay ontology to facilitate discovery and comparison of high-throughput screening data (<http://bioassayontology.org>). In both project HTML, CSS, JSP, Java and Java-relates technologies are used.
- IT and/or fish stock assessment consultant/expert to international organizations like the *Food and Agricultural Organization of the United Nations* (FAO), *Mekong River Commission* (MRC), *South Pacific Commission* (SPC), *French Research Institute for Development through Cooperation* (ORSTOM), *German Agency for Technical Cooperation* (GTZ) and *International Center for Living Aquatic Resources Management* (ICLARM; now WorldFish Center in Malaysia), as well as, local/national organizations on various issues in fisheries software/databases development, tropical fish stock assessment projects, IT strategic planning, project design and enterprise development; and
- Designed/implemented national IT programs related to fisheries resource management in three countries in Asia (Indonesia, Sri Lanka and Philippines); co-authored and taken a major role in the development of *Data Navigator: South Florida* (an online/Internet-based intelligent GIS) published in 2004 for resource managers in the resource; primary author of Reef Ranger: a 3D coral reef management game software (see publications 54 and 55); and member of NCORE's Internal Advisory Committee.
- Other Notable Membership: 13-year member of IEEE Computer Society and IEEE Computational Intelligence Society (formerly IEEE Neural Networks Society); National Center for Coral Reef Research (NCORE) Advisory Committee; U.S. EPA Research and Development Ecosystem Services Research Program (ESRP) Decision Support Framework team; and member of the Semantic Web cluster of the Federation of Earth Science Information Partners.

## WORK EXPERIENCES

**Senior Software Systems Architect/  
Senior Software Engineer**

**January 2003 – present**

**Marine Biology and Fisheries, Rosenstiel School of Marine & Atmospheric Science (RSMAS) / Center for Computational Science - University of Miami, USA**

Lead software engineer/developer for the Gulf of Mexico Coastal Ocean Observing System (GCOOS) Data Portal (<http://gcoos.rsmas.miami.edu>) that is nested in a National Backbone of coastal observations to aggregate and disseminate the region's near real-time oceanographic data in close collaboration with data providers from five states that borders the Gulf and the National Data Buoy Center (NDBC). In close collaboration with Texas A&M University (College of Geosciences), data are streamed from the sources on regular interval and processed in near real-time. These are served in OpenGIS Consortium (OGC) Sensor Observation Service (SOS) compliant using the latest schema developed by the U.S. Integrate Ocean Observing System (IOOS). Gayanilo is a member of the Web Services and Data Exchange working group of IOOS, responsible in the design and publication of the schema and other infrastructures related to the development of a common Data Integration Framework (DIF) to integrate and facilitate interoperability among coastal and ocean observing sensors. This project is in close collaboration with Texas A&M University (College Station).

Most recently, as a Senior Software Engineer of a team to design and develop a semantic web application for the deployment of a bioassay ontology (<http://www.bioassayontology.org>). This project is to enable the search of diverse high-throughput screening (HTS) data and facilitate discovery, comparison and rapid integration of various screening data sets across databases.

Other responsibilities: (i) IT specialist of the NOAA funded three year MARES project (Marine and Estuarine Goal Setting for South Florida; <http://sofla-mares.org/>) to design and develop data/communication portals – a multi-agency collaboration project to reach a science-based consensus about defining characteristics and fundamental processes of the ecosystem regions in South Florida, (ii) assistance in the development and installation of Enterprise Service Bus (ESB) that will integrate platforms, provide robust, secure and scalable platform to support medical translational research; a project in collaboration with the Center for Computational Science (Miller School of Medicine, University of Miami), (iii) continuing maintenance of the *Florida Keys Geographic Information System (Data Navigator)* for resource managers in South Florida and other related GIS projects that were developed and published (see below); (iv) continuing maintenance of the educational 3D coral reef management game software developed and published through the sponsorship of HCRI/NOAA to educate and supplement ongoing activities in public awareness on the threats to coral reef ecosystems as it was designed to provide the visual impact necessary to present the effects of management policies on a simulated environment. (see <http://ncore.rsmas.miami.edu/reefranger/index.htm>), and (v) continuing development and maintenance of NCORE's web pages (<http://ncore.rsmas.miami.edu>) and servers.

Other products:

- (1) **Online GIS facilities:** (i) The *Data Navigator: South Florida* (see Publication 47 below; links is available from <http://floridakeys.noaa.gov/>), (ii) the *Bahamans Online Digital Map Atlas* (<http://bbp.amnh.org/website/gwg.html>), (iii) *Digital Maps/GIS: Antigua*, ([http://www.ncoremiami.org/Antigua/antigua\\_maps.htm](http://www.ncoremiami.org/Antigua/antigua_maps.htm)), and (iv) *Data Navigator: St. Croix and Buck Island* ([http://www.livingoceansfoundation.org/index.php?option=com\\_wrapper&Itemid=163](http://www.livingoceansfoundation.org/index.php?option=com_wrapper&Itemid=163)). Among others, these facilities provide resource managers of the region a ready access to commonly used digital maps, which otherwise will take time to obtain. This Internet-based tool, developed using Microsoft .NET architecture, JavaScripts, Java2 and ESRI ArcIMS/ArcGIS technologies, sorts intelligently pre-constructed thematic maps from several digital layers of data to assist resource managers analyze geo-referenced data and draft management policies/strategies to address an issue. While this system was designed for resource managers, it is presented in a user-friendly interface that can be used for research and educational purposes. The *Data Navigator: South Florida*, includes among others: (i) expert discussion notes that documents how experts interpret the data presented; (ii) metadata that documents the detailed processes used to construct the digital map; and (iii) animated presentation of the data whenever available/applicable; and
- (2) Developed a prototype of agent-based models (ABM) using Java technologies to simulate the reaction of entities in an ecosystem to changes in the environment. The concept, presented in many scientific gatherings (see Publications 45, 47, 50 and 56 below), may be applied to forecast a range of potential ecological reactions to human interventions or natural disturbances on both the ecology of the reef and the socioeconomics of coastal population.

**Information Systems Specialist** **August 2001 – March 2002**  
**Overseas Agro-Fisheries Consultants Ltd (OAFIC), Japan**

(August 2001 – March 2002) Assisted the government of Sri Lanka formulate investment projects through the financial support of the Asian Development Bank (ADB) aimed at increasing production of fish and fish products from freshwater fisheries and aquaculture, and creating new income-generating opportunities. As the *Information Systems Specialist* of the team of international experts (economist, financial specialists, aquaculture specialist, socioeconomic scientists and fisheries scientists), designed a national inland fisheries and aquaculture information system most appropriate for Sri Lanka. The use of the Internet and Oracle 9i-base database engine formed the basis of the design of the information system. The team of experts completed a USD 30M feasibility study that was [later supported by ADB and supplemented by Japan Bank for International Cooperation \(JBIC\)](#). The document included, among others, the logistics involved in the collection of data, what data to collect, how to process the data and reporting options.

(April 2000 – October 2002) Designed a national fisheries information system for the Philippines. This is currently in used (deployment is continuing) nationwide aimed at improving the management of fisheries and related resources. The resulting national

fisheries information system (Philippines Fisheries Information System; PhilFIS) contains six interrelated database management subsystems (Catch and Effort DB, Resource and Ecological DB, Socioeconomic DB, Bibliographic Collection, Document DB, Licensing and Violations DB) and commonly used analytical routines.

As the Data Management Component Leader of the USD86M ADB/JBIC-loan program, the tasks completed: (i) designed, developed and deployed (installation) of all in SQL-databases to ensure seamless integration; (ii) specified the physical network and wireless infrastructures, hardware and software configurations; (iii) designed and participated in information and educational campaign aimed to facilitate the integration of PhilFIS onto the main stream of government and educational systems; and (iv) coordinated with several government agencies to facilitate data exchange. A data management centre (now called, Philippines Fisheries Information Management Center), was constructed and inaugurated in December 2001 to house the state-of-the-art servers and all national databases.

**Database Management Specialist** **July 2001 – September 2002**  
**Pacific Rim Innovation & Management Exponent, Inc. (PRIMEX), Philippines**

(Cross-appointment with OAFIC) As the Database Management Specialist in a team of international experts organized by Asian Development Bank (ADB), designed a [national information system for Indonesia](#). The system design was aimed at facilitating data encoding, data processing and generating local and international statistical reports on captured fisheries production and fishing efforts. The national network was designed around the application of Oracle 8i and Internet technologies taking into consideration the archipelagic nature of the country.

**Research Associate** **December 1999 – July 2001**  
**(IT Specialist/Population Dynamics)**  
**Fisheries Centre, The University of British Columbia, Canada**

As the IT Specialist of the Centre, the duties included: (i) assisting fisheries scientists and researchers upgrade their products to current IT standards; (ii) monitoring and tuning of the communication network as well as the installation and maintenance of network peripherals and software packages as may be required; (iv) assist users in their day-to-day use of both software and hardware – this also included the development of appropriate software packages to resolve computation-intensive operations (see Publication 32 below), (vi) administration of the Windows-2K-based server with over 60 workstations and supervision of LAN technical assistants; and (vii) development and maintenance of the Centre's web pages (<http://www.fisheries.ubc.ca>).

**Fisheries Science Programming Specialist                      June 1987 – November 1999**  
**(Fisheries Science/Management Modeling)**  
**International Center for Living Aquatic Resource Management (ICLARM)**  
**Philippines (now WorldFish Center based in Malaysia)**

This mid-management position in the organization comes with a range of duties in support of the research activities of the center. These included tasks from conceptualization to strategic distribution of mathematical models in software form (Microsoft Visual Basic 6.x; Microsoft C++; Microsoft Access; VB/JavaScripts), documenting the software package developed, maintenance of published software packages, conduct of training courses to enhance user efficiency related to the software developed/published, and maintaining communication with users. Also, technical supervision of most IT related activities and IT personnel in the organization, and assisted in the system design of IT related issues of other projects in the center (e.g. [FishBase](#)).

Written and published 29 documents (see Publication List below) and developed over 10 software packages. Some of these software products have become standards in fisheries science data analyses. As the IT Project/Component leader in a *Team of Peers* environment for IT components of projects, took leads in the formulation of the team members (recruitment when appropriate), formulation of common vision (with close collaboration with the product manager, in this case the fisheries scientist) and development of the Risk Assessment Document to facilitate the analysis, planning, monitoring and control of IT projects. Designed IT systems with entities-relations diagrams; data flows, table definition and report processes. Adopting a *Water Fall* model to system developments, established the milestones, and allocated resources (human, materials and time) and evaluation procedures. Most of the software packages produced were developed for deployment on Microsoft Windows Operating Systems environment using programming languages such as *Microsoft Visual Basic* (versions 5 and 6) and occasionally, *Microsoft Visual C/C++*. On-line help or web-based help utilities are usually developed and deployed as part of the software package.

The two notable accomplishments are: (1) the publication of the [FAO-ICLARM Stock Assessment Tools](#), which is packaged with a [User's Guide](#) and [Reference Manual](#) published by the Food and Agricultural Organization (FAO) of the United Nations (see Publication #50 below for the latest version). Many research and learning institutions now adopt the package as a standard. The software includes over 100 modules (largely with associated relationships) and some contains complex optimization algorithms; and (2) the release and deployment of the [Fisheries Resource Information System and Tools \(FIRST\)](#), which is a regional effort (South and Southeast Asia) with over 15 IT staffs from eight countries (Philippines, Malaysia, Indonesia, Vietnam, Thailand, India, Bangladesh and Sri Lanka) contributing efforts. This project utilized Microsoft VB 6.0 to develop the graphic user interfaces (GUI) and to network with various database engines (DBE).

**Scientific Programmer** **October 1984 – June 1987**  
**German Agency for Technical Cooperation Ltd. (GTZ), Germany**

The terms of reference included duties to conceptualize and develop analytical software for the analysis of fisheries length-frequency data with graphical outputs to facilitate data analyzes, and assist scientist in the conduct of computer-related training courses designed for university researchers and professors.

Two software packages were developed incorporating graphical presentation of the data and results of the analyses – considered by most, as the first interactive microcomputer-based software in tropical fish stock assessment. The packages were deployed on HP 85/86/87 microcomputers. The programming language used was HP Basic.

**SA/Programmer** **July 1984 – October 1984**  
**Philips Components, Inc. (Philippines)**

Designed and developed the company's payroll system (microcomputer-based) and assisted the development and completion of the personnel evaluation system (IBM 360/370 minis on RPG II).

**Senior Instructor/Systems Programmer** **June 1983 – June 1984**  
**Philippines Microprocessor Systems Inc. (Philippines)**

Tutored advance Electronic Data Processing (EDP) courses (include among others, programming in BASIC language, introduction to Operating Systems, and introduction to System Analysis and Design), and developed customized microcomputer-based accounting systems for company customers (Billing Systems; Accounts Receivable; Accounts Payable; Payroll System; and General Ledger) in dBase III/IV environment.

Pioneered and organized the company's learning center with 5 other instructors and developed IT course curriculums (computer operations, programming, and system design and analysis) that was later adopted by the company as a template for all their other learning centers in the Philippines.

**EDP Instructor** **February 1983 – May 1983**  
**Electronic Data Processing and Technical Services, Inc. (Philippines)**

Tutored basic courses in electronic data processing (EDP) to junior/new students.

**OTHER RELATED JOBS/CONSULTANCIES**

**Member** **October 1, 2000 – December 31 2002**  
**Technical Evaluation Team for High Impact Projects (HIPs)**  
**Department of Agriculture, Philippines**

Evaluate/Review IT project and proposals that are classified as HIP by the government; such as, the knowledge-based engineering, expert systems for coastal fisheries management that is executed by the University of the Philippines in the Visayas; called [KDACS](#). Also, to periodical review the on-going HIPs for the

Philippines government to ensure a timely delivery of outputs and objectives are met (or will be met) based on project outputs.

**Software Architect**  
**FAO of the United Nations, Italy**

**May 2000 – May 2002**

Key function was to continue the re-programming of the widely used DOS-based ELEFAN (Electronic Length-Frequency Analysis; see Publication 4 below) and LFSA (Length-based Fish Stock Assessment; published by FAO) to complete the development of FiSAT (FAO-ICLARM Fish Stock Assessment Tools) suite of routines to work seamlessly with Windows 95/98/2000. This software package includes over 100 analytical modules that will allow the analyses of length frequencies for fisheries management applications. It provides facilities for graphical representation of results (2D and 3D). The software and user documentation were published in 2005 in English and in French.

**System Officer**  
**BC Fisheries Research Unit (The Ministry of Fisheries), Canada**

**June 2000 – December 2000**

Duties included: (i) maintenance of the Windows NT client system for the fisheries scientists and researcher of the government of British Columbia (Canada) at their Research Unit in Vancouver (based at the University of British Columbia, Vancouver) to ensure that the system remains responsive to the ever changing needs of their clients; (ii) install software on workstations and LAN equipments, (iii) assist users with computer-related problems, and (v) provide advice and training to users on current technology.

**IT Resource Person/Lecturer**  
**FAO of the United Nations, Italy**

**February 1991 – September 1996**

Provided extensive training courses to fisheries scientists on the application of tropical fish stock assessment software packages developed by ICLARM and FAO to analyze historical data (Fiji, Mexico, Philippines, Indonesia, Thailand, Malaysia, Chile and Peru), and help users resolve problems related to the use of the software and assisted database managers design information systems that will be compatible with the analytical tools introduced.

**IT Consultant**  
**Norwegian Agency for Development Cooperation (NORAD), Norway**

**April 1998**

Designed and developed a prototype of a database management system for the fishing industry of Mozambique given the unique situation of the country following the culmination of the 16-year civil war that ended in 1994. The prototype introduces a new system of data collection that is most economical and yet provides the basic information needed by fisheries managers, i.e. catch per unit of effort figures.

**IT Consultant**  
**Brunei Department of Fisheries, Brunei Darussalam**

**April - May 1997**

Designed, developed and deployed a GIS-based decision support system for fisheries management. A database management system was established in the organization with two series of training courses conducted. The system was developed in Microsoft Access but the mapping (low-level GIS) routines were developed in DOS BASIC. A catch-effort simulation system was part of the information system that were later adopted for other countries (Peru and Sierra Leone)

**Remarks:** There are still other IT consultancies executed in various countries since 1990 involving IT system design reviews and database management systems a majority of which are in fisheries science/management.

**EDUCATION**

Graduate	University of the Philippines at Los Baños, Los Baños, Laguna, Philippines (M.Sc. Computer Science; 1990-93; no-theses)
College	University of the Philippines at Los Baños, Los Baños, Laguna, Philippines (B.Sc. Agricultural Engineering; 1976-82)

**PUBLICATIONS/PRESENTATIONS**

**1985**

1. Saeger J. and **F.C. Gayanilo, Jr.** 1985. ELEFAN I and II live on screen. FISHBYTE 3(2): 13-14. ICLARM, Philippines.

**1986**

2. Saeger J. and **F.C. Gayanilo, Jr.** 1986. A revised and graphic orientated version of the ELEFAN 0, I and II programs for use on HP 86/87 microcomputers. Tech Rep. Dept. of the Mar. Fish. (8):1-233. University of the Philippines in the Visayas, Diliman, Quezon City, Philippines.

**1987**

3. Pauly D., M.L. Palomares and **F.C. Gayanilo, Jr.** 1987. VPA estimates of the monthly population length composition, recruitment, mortality, biomass and related statistics of the Peruvian anchoveta, 1953 to 1981, p. 142-166. *In* D. Pauly and I. Tsukayama (eds.), The Peruvian anchoveta and its upwelling ecosystem: three decades of change. ICLARM Studies and Reviews 15, 351 p. Instituto del Mar del Peru (IMARPE), Callao, Peru; Deutsch Gesellschaft fur Technische Zusammenarbeit (GTZ), GmbH, Eschborn, Federal Republic of Germany; and the International Center for Living Aquatic Resources Management (ICLARM), Manila, Philippines.
4. **Gayanilo, F.C. Jr.**, M.L. Soriano and D. Pauly. 1987. A draft guide to the Compleat ELEFAN. ICLARM Software 2, 65p. International Center for Living Aquatic Resources Management, Manila, Philippines.

### 1989

5. **Gayanilo, F.C. Jr.**, and D. Pauly. 1989. Announcing the release of Version 1.1 of the Compleat ELEFAN. FISHBYTE 7(2):20-21. ICLARM, Philippines.

### 1990

6. **Gayanilo, F.C. Jr.**, 1990. CDS Assistant (ver. 1.0). ICLARM Software 5, 19p. International Center for Living Aquatic Resources Management, Manila, Philippines.
7. **Gayanilo, F.C. Jr.** 1990. CDS Assistant: Utilities for the bibliographic software micro-CDS/ISIS. NAGA, the ICLARM Quarterly 13(2):17-18. ICLARM, Philippines.
8. **Gayanilo, F.C. Jr.** 1990. Book review: "Basic Fishery Science Programs: A compendium of microcomputer program and manual operation", authored by S.B. Saila, C.W. Recksiek and M.H. Prager. NAGA, the ICLARM Quarterly 13(2):19. ICLARM, Philippines.
9. Pauly, D. and **F.C. Gayanilo, Jr.** 1990. The growth of ELEFAN. NAGA, the ICLARM Quarterly 13(2):14-16. ICLARM, Philippines.

### 1991

10. Aquisap, A.C., M.A. Carigma, P.B. Cariño, V.M.J. Castrillo, **F.C. Gayanilo, Jr.**, M.E.S. Guzman, C.C. Janagap, J.L. Maclean, D. Pauly, E.T. Tech and R.M. Temprosa. 1991. Asian Fisheries Science: A profile. Asian Fish. Soc. Spec. Publ. 6, 45p. Asian Fisheries Society, Manila, Philippines.
11. **Gayanilo, F. C. Jr.** 1991. A program for conducting length-converted catch curves when growth is seasonal. FISHBYTE 9(2):72. ICLARM, Philippines.
12. **Gayanilo, F.C. Jr.** and D. Pauly. 1991. The Compleat ELEFAN, Version 1.1: Post-release blues. Fishbyte 8(1): 47-49.

### 1992

13. Pauly, D., **F.C. Gayanilo, Jr.**, R. Froese and V. Christensen. 1992. The ICLARM Software Project. Combined papers: The FishBase Project and the ICLARM Software Project, presented at the World Fisheries Congress, 2-8 May 1992, Athens, Greece.
14. Pauly, D., J. Moreau and **F.C. Gayanilo, Jr.** 1992. A new method for comparing growth performance of fishes applied to wild and farmed tilapias. Paper presented at the Third International Symposium on Tilapia in Aquaculture (ISTA III), 11-16 November 1991, Abidjan, Cote d' Invoire.
15. Prien, M. and **F.C. Gayanilo, Jr.** 1992. SUNLIGHT: A computer program for calculation of daily solar radiation. NAGA, the ICLARM Quarterly 15(3):30-31. ICLARM, Philippines.

### 1993

16. Garcia, S., D. Die and **F.C. Gayanilo, Jr.**, 1993. Software for tropical fisheries research: the needs and response by FAO and ICLARM. ICES CM 1993/D: 7.
17. **Gayanilo, F.C. Jr.** 1993. The ICLARM software project: back to the future. NAGA, the ICLARM Quarterly 16(2-3):13-14. ICLARM, Philippines.

### **1995**

18. Pauly, D., **F.C. Gayanilo, Jr.**, R. Froese and V. Christensen. 1995. Software tools for management of tropical aquatic resources, p. 90-102. *In* G.T. Sakagawa (ed.). Assessment methodologies and management. Proceedings of the World Fisheries Congress, Theme 5. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
19. **Gayanilo, F.C. Jr.** (Implementation). 1995. The San Miguel Bay Story: A presentation of research and management reports on the aquatic resources of San Miguel Bay, Philippines (multimedia CD-ROM).

### **1996**

20. **Gayanilo, F.C. Jr.**, P. Sparre and D. Pauly. 1996. FAO-ICLARM Fish Stock Assessment (FISAT) User's Guide. FAO Computerized Information Series (Fisheries) 7. FAO of the United Nations, Rome, Italy. 180p.
21. Pauly, D., J. Moreau and **F.C. Gayanilo, Jr.** 1996. A new method for comparing the growth performance of fishes, applied to wild and farmed tilapias, p. 433-441. *In* R.S.V. Pullin, J. Lazard, M. Legendre, J.B. Amon Kothias and D. Pauly (eds.) The third International Symposium on Tilapia and Aquaculture. ICLARM Conf. Proc. 41.
22. Aquisap, A.C., M.A. Carigma, P.B. Cariño, V.M.J. Castrillo, **F.C. Gayanilo Jr.**, M.E.S. Guzman, C.C. Janagap, J.L. Maclean, D. Pauly, E.T. Tech and R.M. Temprosa. 1996. Asian fisheries science: a profile, p. 457-488. *In*: S.S. De Silva (ed.) Perspectives in Asian fisheries: a volume to commemorate the 10th anniversary of the Asian Fish. Society. Manila.
23. **Gayanilo, F.C. Jr.** and D. Pauly. Towards a generic trawl survey database management system. Workshop on Sustainable Exploitation of Tropical Coastal Fish Stocks in Asia. Manila, Philippines, 2-5 July. [presentation]

### **1997**

24. **Gayanilo, F.C. Jr.** and D. Pauly. 1997. FAO-ICLARM Fish Stock Assessment (FISAT) Reference Manual. FAO Computerized Information Series (Fisheries) 8. Vol. 2. FAO of the United Nations, Rome, Italy. 265p.
25. Lavapie-Gonzales F., S.R. Ganaden and **F.C. Gayanilo, Jr.** 1997. Some population parameters of commercially-important fishes in the Philippines. Bureau of Fisheries and Aquatic Resources, Department of Agriculture, Philippines, 114p.
26. **Gayanilo, F.C., Jr.**, G. Silvestre and D. Pauly. 1997. User's guide to B:RUN, a decision support system and teaching tool for managing the coastal resources of Brunei Darussalam. ICLARM Software 8, 22p.
27. Pauly, D., **F.C. Gayanilo, Jr.** and G. Silvestre. 1997. A low-level GIS for coastal zone management, with applications to Brunei Darussalam: Part I – The concept and design elements. NAGA, the ICLARM Quarterly 20(2):41-45. ICLARM, Philippines.
28. Jarre-Teichman, A., L. Palomares, **F.C. Gayanilo, Jr.**, M. Soriano-Barth, and D. Pauly. 1997. MAXIMS (ver. 1.0) user's manual: To estimate the food consumption of fishes from diel stomach contents data and population parameters. ICLARM Software Series 4 (rev. 1), 46p. ICLARM, Philippines.

29. **Gayanilo, F.C. Jr.** and D. Pauly. 1997. An update on FiSAT. NAGA, the ICLARM Quarterly 20(3-4):69. ICLARM, Philippines.
30. **Gayanilo, F. C. Jr.**, Strømme, T. Jr and D. Pauly. 1997. Toward a Generic Trawl survey database management system. p. 116-132. *In*: G. Silvestre and D. Pauly (eds.) Status and Management of tropical coastal fisheries in Asia. ICLARM Conference Proceedings 53.

#### **1998**

31. **Gayanilo, F.C. Jr.**, G. Silvestre and D. Pauly. 1998. A low-level GIS for coastal zone management, with application to Brunei Darussalam. Part III: simulation and tracking of oil spills. NAGA, the ICLARM Quarterly 21(1):13-15. ICLARM, Philippines.
32. Pauly, D. and **F.C. Gayanilo, Jr.** 1998. ABee: An alternative approach to estimate the coefficients of the length-weight relationship from length frequencies. ICLARM Software Series 49, 26p. ICLARM, Philippines.

#### **1999**

33. FAO. 1999. Guidelines for the Routine Collection of Capture Fishery Data. FAO of the United Nations, Rome, Italy. 113p. [also available in French and Spanish]
34. Silvestre, G.T., L.R. Garces and **F.C. Gayanilo, Jr.** 1999. Sustainable management of coastal fish stocks in Asia: a regional collaborative project to develop fisheries resources information system, management strategies and action plans. Fourth International Conference on Marine Biology of the South China Sea. Marine Science Institute, University of the Philippines, 19-22 October. [paper presentation]

#### **2000**

35. Ruttan, L., **F.C. Gayanilo, Jr.**, U.R. Sumaila and D. Pauly. 2000. Small versus large-scale fisheries: A multi-species, multi-fleet model for evaluating their interactions and potential benefits. *In*: Pauly, D. and Pitcher T. (eds) Methods for assessing the impact of fisheries on marine ecosystems of the North Atlantic. Fisheries Centre Research Report 8(2): 64-78. The University of British Columbia, Vancouver, Canada.
36. Silvestre, G.T., L. Garces and **F. C. Gayanilo, Jr.** 2000. Sustainable management of coastal fish stocks in Asia. NAGA, The ICLARM Quarterly 23 (1): 45-47.

#### **2001**

37. **F.C. Gayanilo, Jr.**, G. Silvestre, F. Valdez and D. Pauly 2001. Fisheries Resources Information System (FiRST): User Manual. International Centre for Living Aquatic Resources Management, Penang, Malaysia, 126 p.

#### **2002**

38. **Gayanilo, F.C. Jr.**, E. Barrios and A. Tapawan. 2002. Community-based data collection: Pilot testing in Puerto Princesa. Fisheries Resource Management Program Information Series 95. Department of Agriculture, Bureau of Fisheries and Aquatic Resources, Quezon City, Philippines. 87p.

### 2003

39. McManus, J and **F. C. Gayanilo, Jr.** 2003. 3D Agent-based Simulation of Human-Environment Interactions on Coral Reefs: A Prototype. Partners in Environmental Technology Technical Symposium & Workshop, Washington, USA. [poster]

### 2004

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NOTE: Office/Project reports, feasibility studies and other unpublished/classified documents are not included in this list.

  
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