FISHBYTE SECTION

Announcing the Release of FiSAT (version 1.0)

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Abstract

A brief description of the origin, "philosophy", and key features of FiSAT (FAO-ICLARM Stock Assessment Tools), the joint FAO-ICLARM software, is given, along with information on its distribution and maintenance.

Introduction

FAO and ICLARM are proud to announce the release of version 1.0 of their first joint software, the FAO/ICLARM Stock Assessment Tools (FiSAT).

This software, whose development was discussed by Pauly and Sparre (1991), results from the merging of ICLARM's Compleat ELEFAN (Gayanilo et al. 1988) and FAO's LFSA (Sparre 1987)[a], and new routines, e.g., Shepherd's method for growth parameter estimation, and Formacion et al.'s (1991) analysis of extreme lengths. From the Compleat ELEFAN, FiSAT has taken over all routines, and - we hope - the user-friendliness which made it so successful. From LFSA, FiSAT has taken all the routines not yet included in the Compleat ELEFAN, notably Thompson and Bell's model for yield estimation, implemented both for single and multispecies (and multigear) fisheries, and a program that simulates (catch) length-frequency data from sedentary or migratory stocks.

We have presented elsewhere (Garcia et al. 1993; Pauly et al., in press) detailed discussion of the software needs of FAO and ICLARM's clients in tropical developing countries (see also Gayanilo 1993). These contribution emphasized that, to be useful, for the management of tropical fisheries, our software should:

- include routines that can readily be used, and for which data *are* available, or *can* readily be collected;
- run on widely available, low-cost computers, and *not* be designed to run only on sophisticated workstations;
- be user-friendly - as determined by the intended users, *not* by its developer(s);
- generally be introduced to its prospective users through training courses, not solely as a result of a purchase;
- be very cheap, and not copy-protected, as it will be "pirated" anyway.

Last but not least, the institution that produces the software in question must be willing and capable to handle the maintenance of this software, and to respond to users' inquiries and feedback. FiSAT meets all these requirements, as shown below.

Key Features of FiSAT

FiSAT is heavily graphic-oriented, and features high-resolution plots[b] which can help in deciding whether the methods being used behave properly on the datasets being analyzed. These graphs can all be dumped through a laser printer, and thus directly used for publications.

To increase safety in using the methodologies it offers, FiSAT includes more "warnings" and help screens than its two predecessors, and we thus hope that this will help in selecting the appropriate methods and detecting poor data, thereby reducing the risk of misuse of the package and of unjustified blame to the routines for the silly results that may sometimes yield. Thus, for example, the alternative to Modal Class Progression Analysis (also available in FiSAT), an approach for estimating growth parameters from length-frequencies (L/F), now consists of the following steps:

i)   obtain an estimate of L_∞ from a Powell-Wetherall plot, and verify this by analyzing the extreme lengths in the available samples (Formacion et al. 1991);

ii) obtain a preliminary estimate of K by scanning a wide range of K values in very small steps using both ELEFAN I (the only "ELEFAN" routine still so labelled in FiSAT) and/or the method of Shepherd (1987);

iii) assess the quality of the L/F, for various class intervals from the shape of the resulting plot (Fig. 1) and abandon estimation of growth parameters if there are no clear indications of an optimum K value;

iv) correct the L/F for gear selection effect, using gear-specific probabilities of capture from a selection experiment, or analysis of the left, ascending side of a catch curve;

v)   reestimate K, with corrected L/F, and taking seasonal growth into account if appropriate.

These steps could be all implemented using e.g., the Compleat ELEFAN, but it was not straightforward to do

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[a]Neither of these software will be distributed or maintained any longer by ICLARM or FAO.

[b]Some of these plots are inspired by ABASIM, and other fisheries management software developed by the late Philip R. Sluczanowski, to whom this article is dedicated (see also *Naga*, July 1992, p. 18).

Fig. 1. *Fit of von Bertalanffy growth curves of length-frequency datasets, as expressed by the goodness-of-fit index of ELEFAN I ("Rn", ranging from 0 to 1, solid line) and Shepherd's method (score "S", arbitrary scale, dotted line), given fixed values of L_∞ and K values ranging from 0.1 to 10 year^{-1} (all cases based on Moreau et al., in press): A: Alestes leuciscus (L_∞ = 10 cm); ELEFAN I indicates a clear peak, whose presence - if not exact location - is confirmed by Shepherd's method; K is most certainly near the area indicated by the arrow, and the (wide) confidence interval of K can be estimated B: Tilapia rendalli (L_∞ = 26 cm); ELEFAN I shows a number of peaks, of which one is confirmed by Shepherd's method; K may have a value as suggested by the arrow, but this conclusion is tentative. C: Alestes baremoze (L_∞ = 31 cm): neither method suggests an obvious choice for K; the available L/F data do not allow K to be estimated.*
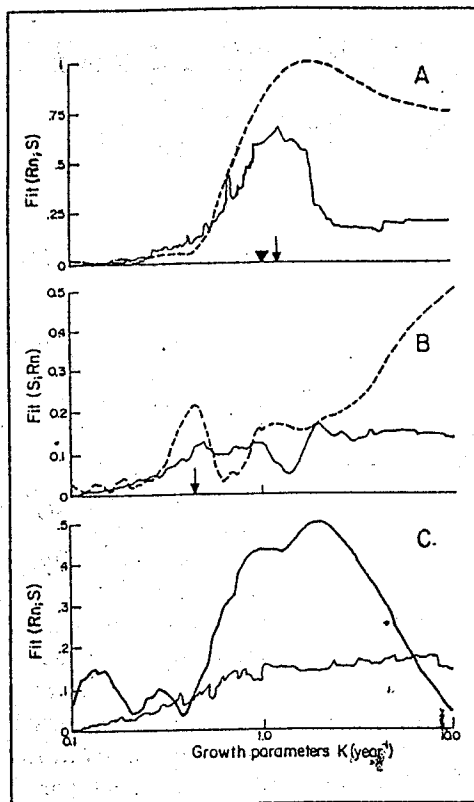
so, and step (iii) was not emphasized, resulting in numerous growth parameter estimates not well supported by data having entered the literature.

FiSAT will be used for stock assessment courses taught through FAO, especially the FAO/DANIDA project "Training in fish stock assessment and fishery research planning" (Venema et al. 1989), and for ICLARM courses. We anticipate that FiSAT will also be used in university settings, and have thus set up arrangements to respond to a wide range of users' queries. Thus, while FiSAT will be distributed by FAO, it is ICLARM - and more precisely FiSAT's programmer, Mr. Felimon "Nonong" Gayanilo, Jr. - who will maintain the software - at least in the forthcoming two years.

Thus, queries concerning "bugs" - real or imagined should be sent to him, along with the documentation (files, error messages, etc.) required for him to *reproduce* the error.

Further, a small committee, representing our two institutions and the user community will evaluate the response to version 1.0 of FiSAT, and identify worthwhile changes and new routines for version 2.0, likely to be optimized for use under Windows.

Version 1.0 of FiSAT is available from FAO in the form of three 3½" HD diskettes for MS-DOS computers, (DOS 3.0 or above) and EGA or better monitors, and is distributed together with a User's Guide (Gayanilo et al. 1994). A detailed manual, emphasizing the theory and the assumptions behind each model included in FiSAT, has been developed which complements FAO's *Introduction to Tropical Fish Stock Assessment* (Sparre and Venema 1992).

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