



During June, Deng Palomares and Daniel Pauly spent a week teaching a newly updated version of the ELEFAN software at the Institute for Fisheries and Aquaculture of the University Cheick Anta Diop of Dakar, Senegal. (Photo: Najih Lazar)

ELEFAN in (Daka)R

by M.L. 'Deng' Palomares and Daniel Pauly

The ELEFAN software and approach for the estimation of von Bertalanffy growth parameters from length-frequency data was developed at the International Center for Living Aquatic Resources Management (ICLARM), in Manila, Philippines, in the early 1980s by Daniel Pauly and two programmers (Noel David and Felimon Gayanilo). It was disseminated in various versions throughout the world, especially in tropical countries, through a series of training courses during the 1980s and 1990s. It also formed the core of a comprehensive software package called FAO-ICLARM Stock Assessment Tools (FiSAT; [1], [2]), still available from the FAO.

Overall, about 5,500 papers based on the ELEFAN approach, as incorporated in FiSAT and its predecessors have been published in the past 30+ years (as identified by Google Scholar records with "ELEFAN" in the title or the body of the text). However, since its release, FiSAT has been updated only once (FiSAT II; [3]), and it has become outdated in content and form. Thus, the

offer was accepted to collaborate with USAID's COMFISH Project in Senegal to produce an updated version of ELEFAN and to test it in a training course in Dakar before releasing it for wider use as open-source software.

The bulk of the R coding was completed by Aaron Greenberg (with Mathieu Colléter also contributing a routine) just in time for a team consisting of Ted Hart (of UBC's Biodiversity Research Centre), Danielle Knip and Deng Palomares (of the *Sea Around Us* Project) to create a stand-alone package copied on 25 USB sticks at the end of May.

Daniel Pauly and Deng Palomares then spent a week in an ELEFAN training course, held at the Institute for Fisheries and Aquaculture of the University Cheick Anta Diop of Dakar, teaching the routines behind and the functioning of the ELEFAN package. The group of 25 Senegalese participants consisted of about one-half fisheries scientists and graduate students, and the other half fisheries inspectors.

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The students and scientists benefitted greatly from this training workshop

While the fisheries inspectors struggled somewhat with the relevance of growth and mortality estimations and clearly preferred Daniel's lectures on fisheries and climate change issues, the students and scientists benefitted greatly from this training workshop and generated – with Deng's help – results for sardinella (*Sardinella aurita*, *S. maderensi*), white grouper or thiof (*Epinephelus aeneus*), bonga (*Ethmalosa fimbriata*) and other species. The results – to our relief – were comparable to those obtained by a group of colleagues (also working for the COMFISH Project) through tedious reading of annual rings on bony structures. Indeed, in the case of octopus (where the cubic root of the weight was used instead of length), results were obtained which could not have been obtained through ageing of bony structures – octopi have no bones...

Thus, overall, the personnel who had arranged the workshop, notably COMFISH Project Leader Chris Mathews and Najih Lazar, Technical Advisor, both of The University of Rhode Island, were as

pleased as we were about both the knowledge that was passed on during the workshop and the performance of the trial version of ELEFAN in R. Obviously, a number of items were noted which require improvement, as well as a swarm of bugs, both of which are due to be fixed in the next two to three months. The high hopes that we have for this new release of ELEFAN in R appear justified.

Daniel used the opportunity of being in Senegal to visit the *Département des Pêches Maritimes*, where he briefed its Director, Mr. J.-P. Manel, and members of his senior staff on the results of the reconstruction of Senegalese marine catches led by Dyhia Belhabib, with support from the MAVA Foundation and co-authors from the COMFISH project (Ms. Vivianne Koutob), the DPM (Mr. Lamine Mbaye) and WWF-Senegal (Mr. Nassirou Gueye). It was very gratifying that our Senegalese partners acknowledged that they have catch-reporting problems, both with regards to substantial illegal fishing in Senegalese waters and unregulated fishing by Senegalese fishers in the waters of neighbouring countries. This acceptance of reality signifies a level of political maturity that is lacking in many other countries where officialdom prefers to stick its head in the sand.

Daniel also used the opportunity, shortly before leaving Dakar, to hold a press conference with a dozen Senegalese journalists to inform them of a recent study authored by Drs William Cheung, Reg Watson and himself, on global warming and fisheries, which implies a dire future for tropical fisheries. One of the workshop participants suggested to Daniel that the public should be "alerted, but not alarmed" by the trend that this paper describes and the implication for Senegalese fisheries. This point to alert people and not alarm them is an excellent formulation of our job as scientists, and luckily, the Senegalese journalists



Photo: Najih Lazar

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The *Sea Around Us* Project website can be accessed at www.seaaroundus.org and contains up-to-date information on the Project.



The *Sea Around Us* Project is a scientific collaboration between the University of British Columbia and The Pew Charitable Trusts that began in July 1999. The Pew Charitable Trusts work around the world to establish pragmatic, science-based policies that protect our oceans, wild lands and climate. Pew also sponsors scientific research that sheds new light on the dimensions of and solutions to the problems facing the global marine environment.

followed up on it. For those who speak French, you can verify that the Senegalese journalists got the point by reading this article published in Le Soleil Online (www.lesoleil.sn), as an example.

Daniel can also attest that Deng was a big success with the national dress that she was given by the participants (see picture, right)!

References

- [1] Gayanilo FC, Sparre P and Pauly D (1996) FAO-ICLARM stock assessment tools (FiSAT). User's guide. FAO Computerized Information Series No. 8. FAO, Rome. 126 p.
- [2] Gayanilo FC and Pauly D (1997) FAO-ICLARM stock assessment tools: reference manual. FAO Computerized Information Series No. 8. FAO, Rome. x+262 p.
- [3] Gayanilo FC, Sparre P and Pauly D (2005) FAO-ICLARM stock assessment tools II (FiSAT II). Revised version. User's guide. FAO Computerized Information Series No. 8. FAO, Rome. vii+168 p.

Correction: This is an updated version of the original article, correcting erroneous affiliations.



Deng Palomares in the Senegalese national dress given to her by participants of the ELEFAN training course held in Dakar. (Photo: Najih Lazar)

The public should be "alerted, but not alarmed" by the trend that this paper describes

On the migrating behaviour of joint-PhD students

By Frédéric Le Manach and Mathieu Colléter

Being a PhD student can be fun! While many of our colleagues picture their thesis research as a lousy job (and will probably strongly disagree with our bold, initial statement), we wish to maintain our position for one simple reason: we are "joint-PhD students." In a nutshell, this means that we get to carry out our research in two different institutions, spending roughly half of the year at each, thanks to an official agreement between our two universities. Twice the fun! (In case you are still having doubts, it also means that we more than double our chances to get access to proper cheese and wine on a regular basis. Think about it.)

Although this alternating behaviour can be socially awkward (e.g., "Hey, see you in six months!"), and can certainly be compared to the behaviour of the migratory species we deal with on a daily basis (such as tuna), we both see it as very beneficial with regards to our PhD theses. Why? Besides avoiding part of the Vancouver

monsoon season, it is a great opportunity for us to be part of two very different teams. While the *Sea Around Us* Project has a global scope, our two other institutes have more technical and location-specific skills and a regional-based approach. So we may have twice the fun – and perhaps twice the workload – but we also get twice the impact in our respective fields (global and regional).



Mathieu Colléter:

"I work on marine ecosystem modeling using the Ecopath with Ecosim (EwE) and EcoTroph software. My research aims to better understand trophic functioning (i.e., food chain interactions) and its variability throughout various marine ecosystems, and to eventually address concerns about the potential impacts of

fisheries on this underlying trophic functioning at a global scale. I spent my initial stay at the Fisheries Centre's *Sea Around Us* Project (under the supervision of Dr Pauly) from February to September 2012, and came back in February 2013 after returning to my home institute, *Agrocampus Ouest* in Rennes, France (under Dr Gascuel's supervision). Originally, I was not convinced of the usefulness of this joint-PhD idea, seeing it as constraining rather than anything else. However, I quickly changed my mind, as the gains created by the *Sea Around Us* Project/*Agrocampus Ouest* collaboration clearly outweigh the disagreements caused by moving every six months.

Studying in two different countries, with two different approaches, is mind-opening

"In the end, personal comfort appeared less valuable in the long run, as this joint-PhD offers me a great deal of experiences that would not have been conceivable otherwise. The only drawback I see is that, naturally, I miss wine, cheese and beautiful French ladies half of the year!"



Frédéric Le Manach:

"Compared to Mathieu, I organized my joint-PhD the other way round: my main lab is the Fisheries Centre's *Sea Around Us* Project (under Dr Pauly's supervision), and I recently returned from a six-month period at the *Centre de Recherche Halieutique* in Sète, France (supervised by Dr Cury). I focus on global fishing access agreements, and look at the economic, social and ecological implications of these complex deals generally held between developed and developing countries. Ultimately, I would like to be able to propose a framework for these agreements that would be as fair as possible to all stakeholders.

"I feel that being part of these two teams is highly beneficial to my thesis: Vancouver provides

me with the global scope of my research, which includes a fair amount of discussion on international relations and economic/political games from the developed countries' perspective. While the team in Sète offers me a remarkable body of knowledge on regional fisheries, for example, in the Indian Ocean and in West Africa. By combining both aspects, I feel like I will be able to cover my research topic more thoroughly than if I had to work with only one of these research groups."

From a personal perspective, we also believe that studying in two different countries, with two different approaches, is mind-opening, in the sense that we get to work with different people, who use different tools, and who certainly have different perspectives on the world out there. We do hope this will be reflected in our future employment opportunities, as we might be able to work under a wider array of situations than other "regular" students.

On a more academic matter, an official joint-PhD agreement (in contrast with other widespread, less official, partnerships) also has other benefits, such as the fact that our degrees will be delivered by two partner universities, as we are registered at both. This means that our diplomas will be recognized in both countries, and that until we graduate, we can access the financial, technical and human resources available at both universities – something which other less formal partnerships may not allow. Finally, we also believe that this is a relatively easy and fairly efficient way to further collaborations between different institutions, which in turn allows us to label the fun we have as "useful."

The bottom line is that, apart from the tiny disagreements involved – such as becoming homeless every six months – we would sign up again if we had to do another PhD (i.e., never!).

