A lecture on Ecosystem Acoustics will be held from November 4-14, 2019 (60 h) in Recife, Brazil, as part of the Master and PhD program on Oceanography of the Federal University of Pernambuco (UFPE). This course is a contribution to the LMI TAPIOCA and to the EU H2020-BG Project TRIATLAS.

Coordination: Arnaud Bertrand (IRD/Marbec-UFPE-UFRPE)
Lecturers Arnaud Bertrand, Jérémie Habasque (IRD/LEMAR) and Gary Vargas (UFRPE).

Context
Underwater acoustics have evolved from a classical approach oriented to the assessment of exploited resources to an ecosystem approach. Active acoustic instruments allow for a comprehensive and simultaneous description of biotic compartments (from zooplankton to top predators) of marine ecosystem, but also for a characterisation of a variety of physical characteristics (internal waves, temperature fronts, oxycline, substrate type, etc.). The objective of the course is to provide the theoretical and technical knowledge to process acoustic data with an ecosystem perspective.

Pre-requisites
Knowledge in R and/or Matlab programming, understanding of English.

Programmatic Content
The course is divided into two parts. The first theoretical part (no restriction in the number of participants) is intended to introduce the main concepts of underwater acoustics. The second part, practical, is designed for people who have the objective to learn how to actually process acoustic data (maximum: 15 persons).

Part A - Theory:
1. Introducing underwater active acoustics
2. Sound in the Ocean: principles and echosounding
3. Echogram
4. Target strength
5. Echointegration, survey design
6. Multifrequency
7. Current activities in Northeast Brazil
Part B – Practice:

Processing tool: Matecho (Perrot et al., 2018)

✓ Introducing software
✓ Exploring data
✓ Data cleaning (bottom correction, phantom bottom echo, noise removal)
✓ Echointegration
✓ Shoal detection
✓ Bifrequency algorithm analysis tools (Matlab)
✓ TS tracking
✓ Cline extraction
✓ RGB echogram
✓ Zscore
✓ Application to the data from participants

Preliminary bibliography


Application

The lecture is free of any fees. Candidate should contact arnaud_bertrand@ird.fr (short CV and short motivation letter).