

The Workshop on Optimization of Biological Sampling at Sample Level (WKBIOPTIM)

The Workshop on Optimization of Biological Sampling at Sample Level (WKBIOPTIM), chaired by Ana Cláudia Fernandes*, Portugal, and Julie Coad Davies*, Denmark, will meet in Lisbon, Portugal, 20–22 June 2017, to:

- a) Discuss indicators of sample quality that can be used in communicating the need and effects of statistical optimization of sampling to end-users (e.g., effective sample size; variability in mean length, age frequency, number of modes in distributions, etc.);
- b) Carry out hands-on work on code for statistical optimization of biological samples based on the CS and CA exchange format of the RDB and sampling strategy used to obtain the data. Code should be general and applicable to samples from different commercial sampling programmes and surveys. Different sampling effort strategies (e.g., fixed number, number dependent on size-span of the sample) and sampling strategies (e.g., simple random, two-stage stratified sampling) should be considered
- c) Test the code developed in a set of case-studies and quantify effects, advantages and disadvantages of different options of statistical optimization at sample level in terms of cost and time-savings involved;
- d) Identify a road map for the discussion with end-users of optimization perspectives

Pre-WK work on scripts and quality indicators will be required.

WKBIOPTIM will report by 17 July 2017 to the attention of ACOM and SCICOM.

Supporting Information

Priority	This workshop is considered to have a high priority for already established and new commercial fishery and survey sampling programmes developed under the MAUP. The expectation is that the time and costs that will be saved by the development and implementation of statistical optimization of the number of samples collected in commercial catch sampling and surveys will be fundamental to increase data provision on data on data-poor stocks and the environmental variables.
Scientific justification	Statistical sound sampling is a requirement of the new EU-MAUP that now specifies that “where data are to be collected by sampling, Member States shall use statistically sound designs” (COM IMPL DEC 2016/1701). One important component of a “statistically sound design” is that sampling effort is optimized and fit for purpose, i.e., that time and costs spent in sampling can be effectively justified in terms of quality of the information finally provided to end-users. Increasing demands to determine MSY reference points for an increasing number of stocks, including many data-poor stocks, and, at the same time, to collect additional environmental information (e.g., during surveys), make optimization of the number of length measurements, age and maturity estimation a priority since these tasks involve costs and time that when misspent limits the sample of other stocks and environmental variables. Economy-related fluctuations in the budgets available for sampling in some ICES countries endanger data collection and further emphasise the need to secure national labs spent time and funds where they are most needed. Recent WK and publications, including PGDATA and WKCOSTBEN, have pointed out to the likely existence of oversampling in lower stages of the sampling designs of some stocks, where an excessive number of individuals appears to be being sampled that does not accrue

	significant additional information to the very characterization of the sample itself, much less to data-provision to end-users after data is aggregated at higher levels. Evidence exists that cuts of over 50% in the number of lengths, ages and maturity data collected from some samples may be achievable without significantly change estimates obtained while saving precious time and resources. The WK aims to produce and test a set of R-scripts that can be used to identify appropriate sampling levels for biological samples of different stocks and surveys. Evaluation of the effects of statistical optimization at sample level requires the identification of indicators that characterize the main properties of the samples in terms of the information obtained on length, age and maturity (ToR a). Statistical optimization is carried out with R-scripts that simulate the effects of different sample sizes (e.g., fixed, dependent on number of size classes) and sampling strategies (e.g., random sample, stratified sampling) (ToR b). To ensure exchange of R code and future developments, exchange format CA/RDB will be used and code programmed in a general way. The advantages of statistical optimization at sample level require testing and demonstration (ToR c) and a roadmap for discussion with end-users of optimization perspectives (ToR d)
Resource requirements	The data collection programmes which provide the main input to this group are already underway, and resources are already committed. All EU countries have already available the datasets in the RDB/CA format required for analysis. The additional resource required is limited to the preparation of R-scripts, selection of case-studies, and attendance at the workshop. Participants are requested to bring to the WK, national examples of CA and CS table (e.g., their 2015 upload to RDB) for analysis during the WK.
Participants	WK should be composed of a) a subset of participants should be familiar with R-code to the level of “loop coding” and “function building”, b) a subset of participants experienced in age and reproduction analysis. In view of its relevance to the data collection within ICES, the EU-MAUP and regional sampling designs, the Workshop is expected to attract wide interest from those involved in WGCATCH and WGBIOP. Members of survey groups located under SSGIEOM are also among the probable participants as may national staff responsible for planning protocols for biological sampling.
Secretariat facilities	Some secretarial support will be needed.
Financial	Member States may fund this through their EMFF programme..
Linkages to advisory committees	ACOM and SCICOM
Linkages to other committees or groups	WGCATCH, WGBIOP, PGDATA
Linkages to other organizations	RCMs