

ICES TCAVMS REPORT 2012

**Report of the ICES Training Course:
Analysing and visualization of VMS and EU
logbook data using the VMStools R package
(TCAVMS)**

25–29 June 2012



ICES

International Council for
the Exploration of the Sea

CIEM

Conseil International pour
l'Exploration de la Mer

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Participants at the course “Analysing and visualization of VMS and EU logbook data using the VMStools R package” Training Course 25–29 June 2012 at ICES Headquarters in Copenhagen. The course was given by Doug Beare, Researcher, The WorldFish Center, Penang, Malaysia, (#1 sitting in front) and Niels Hintzen, Researcher, IMARES, The Netherlands (#2 sitting in front).

Report of the ICES Training Course
“Analysing and visualization of VMS and EU logbook data using the
VMStools R package”,
25-29 June, 2012
by
Doug Beare and Niels Hintzen

1 Summary

The training course “Analysing and visualization of VMS and EU logbook data using the VMStools R package” was conducted for the first time under the ICES Training Programme 25-29 June 2012 at ICES Headquarters in Copenhagen. Twenty-four students from 12 countries participated in the course (Annex 1). From the perspective of the instructors, the course was a success although some adjustments can improve the knowledge and skill transfer to the trainees (see 2 Recommendations).

Feedback from students was solicited using a course evaluation questionnaire. Results indicate that both the amount of material covered and the degree of difficulty ranged from “below average” to above “average” with the mode being “average”. A large majority of the participants (100%) rated the helpfulness of the teaching staff and the clarity of the presentation as above average. 100 percent of the respondents rated the course overall as “above average” (Annex 2). Individual feedback from trainees to the question “Good features of this course/suggestions for improvement”:

- Good presentations, linked to code available easily online. Pleased with the lack of paper that is often associated with courses in other locations. Suggestion for improvement for other situations outside the normal EU standards, i.e. using fine scale haul by haul logbook data.
- Perhaps practice section should include references to the results, so people can watch what they should get (such as graphs, tables).
- The teaching staff were very helpful and accessible. A suggestion would be to allocate more time for a more thorough assessment and analysis of students' individual datasets.
- Appreciated the summaries of what we learnt the day before - as there are lots of iterative learning steps or alternative ways of achieving certain outputs these summaries really helped reiterate the process overall and what the key functions were. Could potentially provide the practical code in .r format so that, if you prefer to learn by putting it straight into R and seeing what each part does you can achieve that without spending lots of time copy/paste and formatting. Note - I am not suggesting this in place of the current format, but as an optional alternative since people may learn better as it is, some would appreciate the other way.
- The course content proved to be, as anticipated, quite interesting and with good chances of future use in the analysis of my country's vms data. However, the use of the code is not straightforward, especially for those without a good working knowledge of R. This makes it difficult to follow the lectures and the understandi what the code does exactly. It is suggested that attendants be warned about this issue. Also, it would be advisable that the instructors make more in-depth effort in illustrating the different pieces of code. All in all the course was worthwhile, with room for improvement in future editions.
- Although most of the vmstools scripts with its explanations step by step are available in the wiki, it would be a good idea to put all together and give them to the students, since probably most of them don't know it. Overall I

found the course to be an excellent experience and I will be soon using the scripts and ideas I have during these days.

- I would be interesting to have more time during the course to work with our own data, to can resolve some doubts that of sure will arise during the application of the vmstools to the real VMS and logbooks data.
- I would suggest to put some more explanation between the R codes of the practicals. The fact that you have to do the practical yourself and that you can use your own data is very useful and are the strong points of this course.

2 Recommendations

The course would be improved by having more graphics and tables in the wiki. More time should be spent going through the individual functions in `vmstools`. We also need to find a better way to deal with people's own data. I'm not sure if we could devote more time to it during the course though? We could be more insistent about checking, double-checking and checking format again before the course. The level of R knowledge was a bit lower than I'd expected and we maybe should be more specific in the brochure.... But then we run the risk of scaring people off? The course could be improved by including more graphics in the wiki and include the results of the exercises directly in the wiki. This will enhance the self-learning experience. Also, we should look into some of the most important functions more and perhaps provide some graphical schemes of e.g. how to clean data. So, making a diagram of steps and analyses you can do with your data, and the functions that can be used there. The cheat-sheet does this in a sense already but could be made more graphical. This time, the course had its primary focus on the practicals, I'm not sure if we should expand the non-practical side of it, and have more discussions, it would be something different for a change though.

I'd like to reiterate however that communicating a basic R knowledge is crucial.

3 Course description

Context:

Growing pressures by various human activities on the marine environment and international commitments to the conservation of biodiversity or seafloor integrity have led to increased interest in marine spatial planning and in the tools required for an assessment of the impact of these pressures. Fishing is considered, given its widespread occurrence, to be the main human activity impacting the seafloor. Vessel Monitoring by Satellite (VMS) system data have been collected from 2000 onwards and cover the majority of EU fishing fleet capacity. These data have proven to be a valuable source of information on the spatial distribution of fishing effort: especially when combined with logbook data. The combined analyses, therefore, of VMS and logbook data allows researchers to investigate the fine details of fishing behaviour, and estimate the distribution of landings (and their cash values) at far higher precision than has been possible in the past. Furthermore the overall impact of fishing on the marine environment can be assessed. The aim of this course is to introduce participants to best practice in the combined analysis of VMS and logbook data. Students will be guided through the entire process starting with the initial handling and processing of the raw data to the final estimation of appropriate indicators.

Objective:

The objective of the course is to provide instruction in the use of the VMStools software package for the simultaneous analysis of VMS and logbook data. Emphasis will be placed on exploring the spatial distribution of fisheries, and the behaviour of fishers at sea. Students will be guided through the entire process of obtaining and cleaning VMS and logbook data, making simple plots and combining the datasets to enable more advanced analyses such as dispatching the landings at higher spatio-temporal resolutions (than is available in the logbook data) and calculating indicators (e.g. area of seabed fished). Instruction will also be given in how to use VMStools to convert logbook and VMS data to standard formats such as ICES FishFrame enabling pan-European datasets to be constructed in the future.

4 Course programme and instructors

The five-day course was organized as a combination of presentations, discussions, and class exercises.

The morning sessions will consist of lectures on background and theory and introduction to the 'practicals'. The afternoons will be arranged as computer practicals where VMS and logbook data analysis will be demonstrated using the VMStools software. During these afternoon sessions interaction among the course participants will be encouraged.

Course lectures covered:

1. A brief introduction to the use of R, functions, scripting and installing libraries.
2. VMS data – advantages, limitations, data confidentiality issues.
3. EU logbook data – advantages, limitations, data confidentiality issues.
4. EU logbook data métier analyses based on species composition of landings.
5. Combining VMS and logbook data – why it is important?
6. Standardising VMS and logbook analyses for populating pan European databases, e.g FishFrame.
7. Indicators – what do they tell us?
8. Introduction to spatial statistics – shapefiles, points, lines, polygons, map projections, and data-storage.
9. Exploring the connection between fishing effort and other possibly explanatory variables (e.g. depth, primary production, temperature, wind speed).

Course practicals covered:

1. Getting the VMS and logbook data into R
2. Cleaning and processing the VMS and logbook data, and accounting for potential problems.
3. Linking VMS and logbook data and exploring the benefits.
4. How to link VMS, logbook data to 'spatial' grids.
5. Interpolation methods for VMS tracks.
6. Calculating indicators (eg. Percentage area trawled) at different spatial scales.
7. Plotting, exporting to GIS and FishFrame.
8. How to link VMS data with other spatial datasets.

Instructors:

Doug Beare and Niels Hintzen have extensive experience in analyzing VMS and logbook data, and are among the core developers of the VMStools software developed with the support of the EU funded project, 'Development of tools for logbook and VMS data analysis' (No MARE/2008/10 Lot 2). They will lead the course and provide course material. Guest lecturers will be invited to provide expertise on (among other aspects) métier analyses and the FishFrame database.

Annex 1: List of participants

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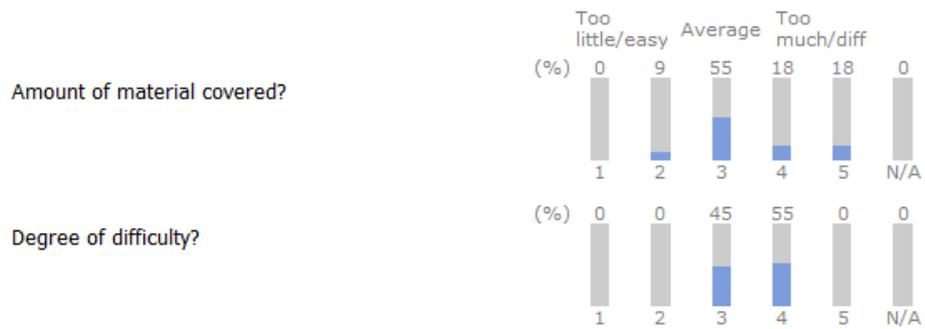
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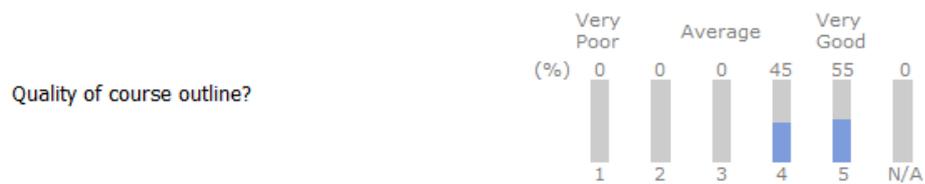
Annex 2: Course evaluation questionnaire responses

2. Course Content

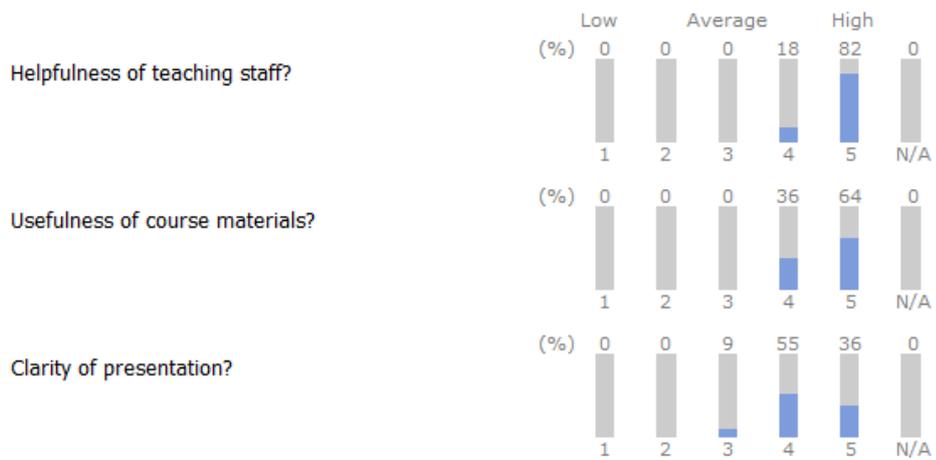


Total: 11

3. Course Organization

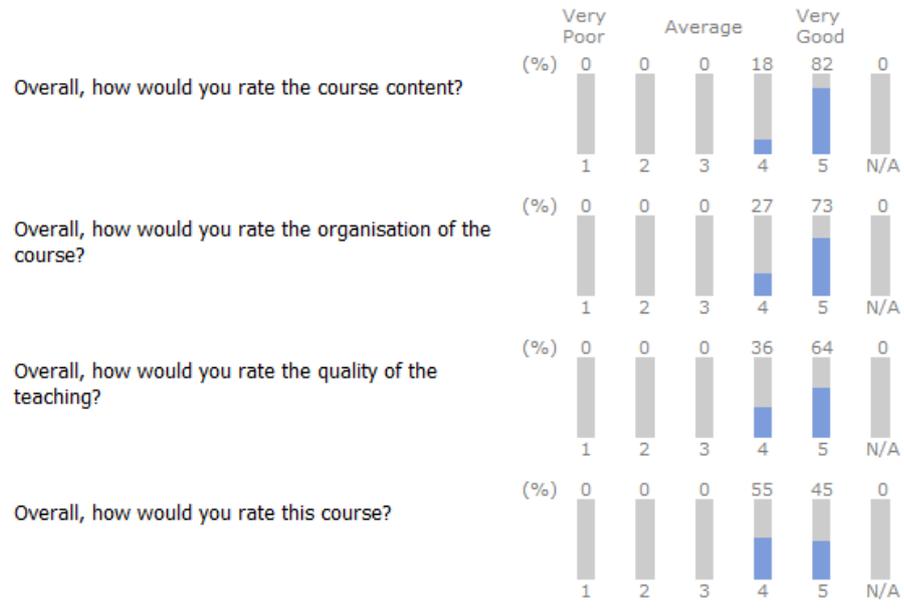


4. Teaching and Learning Support



Total: 11

5. Overall Evaluation



Total: 11