Annotating optical images from ROVs or drop-frames in Vulnerable Marine Ecosystems studies

Brigitte Guillaumont[1], Cyril Carré[1], Inge van den Beld[1], Lydia Beuck[2], Jamie Davies[1]

[1]IFREMER DEEP/LEP, B.P.70, 29280 Plouzané, France bguillau @ifremer.fr
[2] Senckenberg am Meer, D-26382 Wilhelmshaven, Germany

The attention to Vulnerable Marine Ecosystems (VME) in the deep-sea has increased in the last few decades for several reasons, such as fishery and oil exploration activities. Marine Protected Area networks have to be developed and techniques to investigate the seafloor, such as acoustic survey techniques and optical remote sensing, play an important role in this. Image footage from Remotely Operated Vehicles (ROVs) or towed camera is a very good method to analyse and compare abundances and compositions of large epifaunal species in several deep-sea areas. This is particularly well adapted in the case of vulnerable habitats dominated by corals or sponges, as it is less destructive than a trawl sampling. Developing of standardized image annotations becomes an important goal. However, due to availability of historical data, technical reasons or budget limitations, teams are often confronted with the use of various imagery sources and have to develop methodologies for optimizing these data.
Within the European fp7-funded project CoralFISH, IFREMER (France) has developed a program (COVER) which promotes standardization of annotation but keeps a large degree of flexibility. A methodology has been proposed to CoralFISH partners and improved in cooperation; it is based on common knowledge tables with a hierarchical structure where necessary. These tables have been defined taking existing references such as EUNIS, CMECS, Worms Register into consideration.
Cover is able to visualise and synchronise different types of videos and still images. The snapshot generator allows frame grabs to be made at regular time or distance interval. These frame grabs can be used for statistical analysis. The annotation interface has configurable components linked with the knowledge tables: keyboard shortcuts, buttons, combo lists, and sliders. It is also possible to enter comments. The user can organize items by blocks following thematic annotations like substrate type, benthic habitat/communities, taxa and anthropogenic impacts… This interface can be adapted to the needs of the area, the type and quality of images.
Some features of Cover will be introduced into the existing software Adelie (IFREMER).