

Reef Check: involvement of SCUBA diver volunteers in the Coastal Environment Monitoring Protocol for the Mediterranean Sea

M. Ponti¹, G. Rossi², M. Bertolino², F. Betti², M. Palma³, U. Pantaleo³, M. Prevati³, A. Scinto³, C. Huete Stauffer³, E. Turicchia¹, R.A. Perlini¹, G. Leoni¹, F. Fava¹ and C. Cerrano³

¹ Centro Interdipartimentale di Ricerca per le Scienze Ambientali, University of Bologna, Via S. Alberto 163, 48123 Ravenna, Italy
Email: massimo.ponti@unibo.it

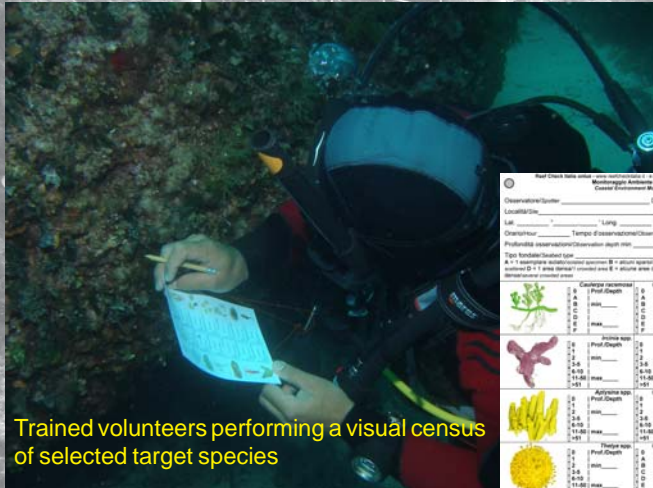
² Reef Check Italia Onlus, c/o Dipartimento di Scienze del Mare, Polytechnic University of Marche, Via Breccie Bianche, 60131 Ancona, Italy. postmaster@reefcheckitalia.it

³ Dipartimento per lo Studio del Territorio e delle sue Risorse, University of Genoa, Corso Europa 26, 16132 Genova, Italy.

Science has neither the work force nor the financial resources to meet the demands that are being placed upon it. However, much of the research that is needed to fulfil biodiversity action plans is labour intensive but technically straightforward. Volunteer-based monitoring is a potential solution to this problem. The use of macrodescriptors, easily recordable even by non-specialists, allows the involvement of laypeople, in order to add further data to those provided by the scientific community.



Proper training is essential to improve the awareness of citizens and their ability to participate in monitoring programs



Trained volunteers performing a visual census of selected target species

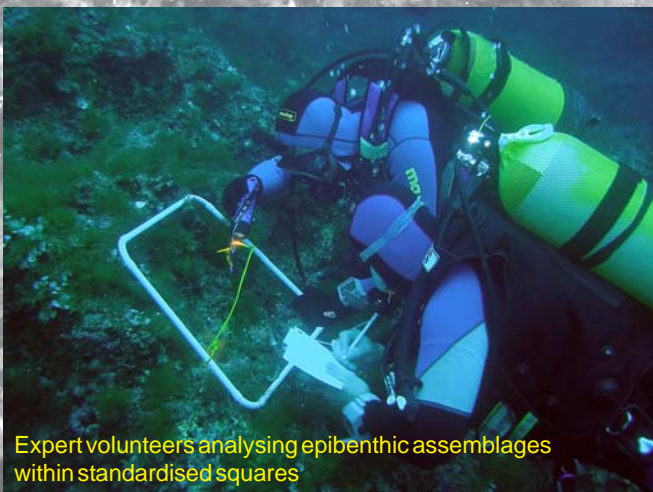
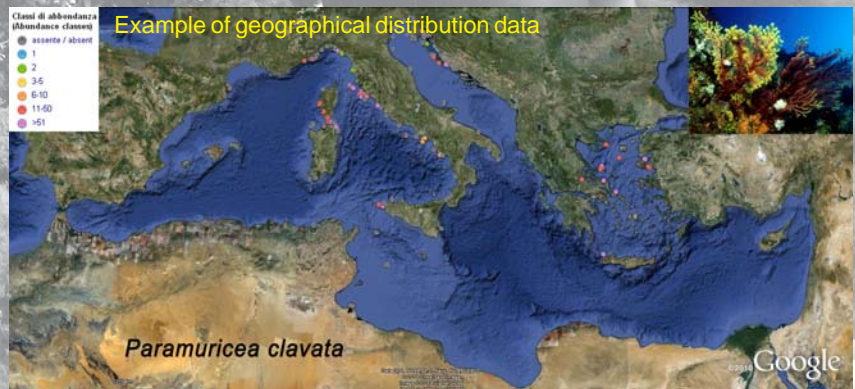
Reef Check Italia - Macrodescriptors for Coastal Environment Monitoring	
Macrodescriptors	Abundance classes
Algae (green)	1, 2, 3-5, 6-10, 11-50, >51
Algae (red)	1, 2, 3-5, 6-10, 11-50, >51
Algae (yellow)	1, 2, 3-5, 6-10, 11-50, >51
Algae (orange)	1, 2, 3-5, 6-10, 11-50, >51
Algae (purple)	1, 2, 3-5, 6-10, 11-50, >51
Algae (brown)	1, 2, 3-5, 6-10, 11-50, >51
Algae (grey)	1, 2, 3-5, 6-10, 11-50, >51
Algae (black)	1, 2, 3-5, 6-10, 11-50, >51
Algae (white)	1, 2, 3-5, 6-10, 11-50, >51
Algae (pink)	1, 2, 3-5, 6-10, 11-50, >51
Algae (light blue)	1, 2, 3-5, 6-10, 11-50, >51
Algae (dark blue)	1, 2, 3-5, 6-10, 11-50, >51
Algae (light green)	1, 2, 3-5, 6-10, 11-50, >51
Algae (dark green)	1, 2, 3-5, 6-10, 11-50, >51
Algae (light yellow)	1, 2, 3-5, 6-10, 11-50, >51
Algae (dark yellow)	1, 2, 3-5, 6-10, 11-50, >51
Algae (light orange)	1, 2, 3-5, 6-10, 11-50, >51
Algae (dark orange)	1, 2, 3-5, 6-10, 11-50, >51
Algae (light purple)	1, 2, 3-5, 6-10, 11-50, >51
Algae (dark purple)	1, 2, 3-5, 6-10, 11-50, >51
Algae (light brown)	1, 2, 3-5, 6-10, 11-50, >51
Algae (dark brown)	1, 2, 3-5, 6-10, 11-50, >51
Algae (light grey)	1, 2, 3-5, 6-10, 11-50, >51
Algae (dark grey)	1, 2, 3-5, 6-10, 11-50, >51
Algae (light black)	1, 2, 3-5, 6-10, 11-50, >51
Algae (dark black)	1, 2, 3-5, 6-10, 11-50, >51
Algae (light white)	1, 2, 3-5, 6-10, 11-50, >51
Algae (dark white)	1, 2, 3-5, 6-10, 11-50, >51
Algae (light pink)	1, 2, 3-5, 6-10, 11-50, >51
Algae (dark pink)	1, 2, 3-5, 6-10, 11-50, >51
Algae (light light blue)	1, 2, 3-5, 6-10, 11-50, >51
Algae (dark light blue)	1, 2, 3-5, 6-10, 11-50, >51
Algae (light dark blue)	1, 2, 3-5, 6-10, 11-50, >51
Algae (dark dark blue)	1, 2, 3-5, 6-10, 11-50, >51
Algae (light light green)	1, 2, 3-5, 6-10, 11-50, >51
Algae (dark light green)	1, 2, 3-5, 6-10, 11-50, >51
Algae (light dark green)	1, 2, 3-5, 6-10, 11-50, >51
Algae (dark dark green)	1, 2, 3-5, 6-10, 11-50, >51
Algae (light light yellow)	1, 2, 3-5, 6-10, 11-50, >51
Algae (dark light yellow)	1, 2, 3-5, 6-10, 11-50, >51
Algae (light dark yellow)	1, 2, 3-5, 6-10, 11-50, >51
Algae (dark dark yellow)	1, 2, 3-5, 6-10, 11-50, >51
Algae (light light orange)	1, 2, 3-5, 6-10, 11-50, >51
Algae (dark light orange)	1, 2, 3-5, 6-10, 11-50, >51
Algae (light dark orange)	1, 2, 3-5, 6-10, 11-50, >51
Algae (dark dark orange)	1, 2, 3-5, 6-10, 11-50, >51
Algae (light light purple)	1, 2, 3-5, 6-10, 11-50, >51
Algae (dark light purple)	1, 2, 3-5, 6-10, 11-50, >51
Algae (light dark purple)	1, 2, 3-5, 6-10, 11-50, >51
Algae (dark dark purple)	1, 2, 3-5, 6-10, 11-50, >51
Algae (light light brown)	1, 2, 3-5, 6-10, 11-50, >51
Algae (dark light brown)	1, 2, 3-5, 6-10, 11-50, >51
Algae (light dark brown)	1, 2, 3-5, 6-10, 11-50, >51
Algae (dark dark brown)	1, 2, 3-5, 6-10, 11-50, >51
Algae (light light grey)	1, 2, 3-5, 6-10, 11-50, >51
Algae (dark light grey)	1, 2, 3-5, 6-10, 11-50, >51
Algae (light dark grey)	1, 2, 3-5, 6-10, 11-50, >51
Algae (dark dark grey)	1, 2, 3-5, 6-10, 11-50, >51
Algae (light light black)	1, 2, 3-5, 6-10, 11-50, >51
Algae (dark light black)	1, 2, 3-5, 6-10, 11-50, >51
Algae (light dark black)	1, 2, 3-5, 6-10, 11-50, >51
Algae (dark dark black)	1, 2, 3-5, 6-10, 11-50, >51
Algae (light light white)	1, 2, 3-5, 6-10, 11-50, >51
Algae (dark light white)	1, 2, 3-5, 6-10, 11-50, >51
Algae (light dark white)	1, 2, 3-5, 6-10, 11-50, >51
Algae (dark dark white)	1, 2, 3-5, 6-10, 11-50, >51

Volunteers have already made significant contributions to scientific knowledge through their participation in a range of studies. The potential of this workforce is well illustrated in the tropical programme 'Reef Check'. Recreational divers surveyed over 300 reefs in 31 countries in a global survey that was certainly beyond the resources of conventional scientific projects. In northern Europe, NELOS (www.biologie.nelos.be) in Belgium and The Netherlands, and SEASEARCH (www.seasearch.org.uk) in the UK, are well-established projects that have developed observation protocols appropriate for their target areas and objectives.

Since 2006, the Mediterranean network, coordinated by Reef Check Italia onlus (RCI), involves more than 600 trained recreational divers that conduct around 2.000 surveys. They apply a standardised visual census method concerning up to 39 easily identifiable target species. All the data are stored in an online database (www.reefcheckitalia.it).



Example of geographical distribution data



Expert volunteers analysing epibenthic assemblages within standardised squares

RCI's Coastal Environment Protocol includes seasonal assessment of epibenthic assemblages in selected monitoring stations. Expert volunteers analyse the presence/absence of morphological/functional groups within standardised and replicated squares. This method allows the identification of long term trends linked to human impacts and global changes. Some Italian Marine Protected Areas adopt this method within their standard monitoring program.

Citizen science allows all those who are interested in the marine resource to contribute to its understanding. Beyond providing valuable data, the increased awareness that comes from participation in the surveys is vital to the protection of coastal marine resources.