

Web Ecological Knowledge (WEK) – A still neglected scientific opportunity

Di Camillo Cristina¹, Ponti Massimo² and Cerrano Carlo¹

¹ Department of Life and Environmental Sciences, Marche Polytechnic University, Via Breccie Bianche, 60131 Ancona, Italy
E-mail: c.dicamillo@univpm.it

² Department of Biological, Geological and Environmental Sciences and Interdepartmental Research Centre for Environmental Sciences, Via Sant'Alberto, 163, 48123 Ravenna, Italy

Besides people who voluntarily participate in marine conservation or monitoring programs (i. e., *citizen scientists*), there are millions of internauts who unintentionally publish information about the distribution of marine species in the World Wide Web (WWW). These data are scattered among websites or social network pages of dive centres, underwater photographers and scuba divers. This information could be gathered to integrate or cross-validate scientific data, to support scientific analyses and to inform decision makers for management purposes. All the ecological information contained in the WWW and exploitable for scientific purposes will be here termed as Web Ecological Knowledge (WEK).

The WEK is constantly fueled by internauts, representing a free, refreshable, long-term exploitable reservoir of information.

Particular attention should be given to underwater videos published on the WWW, which can provide additional information allowing i) to extract abundance and distribution data of target species at local scale, ii) to detect temporal changes of seascapes in the most popular dive sites, iii) to find unexpected interactions between conspicuous species, iv) to locate particularly vulnerable sites, v) to detect the presence of lost fishing lines and damaged organisms, all this without the costs of a true field expedition. Videos are useful to establish which areas should be monitored by scientists due to their richness in species biodiversity and vulnerability. Since videos may provide additional information compared to photographs and visual observations, simple protocol standards for video recording should be included in marine *Citizen Science* programs (CS) to train non-professional underwater video operators. Moreover, crowdsourcing initiatives could be promoted to invite scuba divers to add date, coordinates and depth to their videos. Videos by trained amateurs should be shared on the WWW to be freely available to scientists. A georeferenced archive linking of underwater videos potentially useful for scientific purposes may help in finding information on species distribution.

Here, we want to highlight the huge potential of data shared on the WWW to integrate marine sciences even in case of little funding for fieldwork. Since many dive spots are mostly frequented by recreational divers rather than academics, it is more likely that non-scientific divers were in the right place at the right time to unintentionally record species, peculiar behaviours or responses to unpredictable disturbance events. This is an opportunity already exploited through different initiatives on land. For this reason, the diving system could address specific commercial strategies focused on the potential of CS projects.

Keywords: Web Ecological Knowledge; WEK; occurrence records; social media; WWW; crowdsourcing; data sharing; open access