

***In situ* investigations of gelatinous zooplankton and marine snow.**

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Gelatinous zooplankton fauna can constitute a significant fraction of the macroplankton biomass. Most species are easily damaged and often destroyed by conventional sampling with plankton nets. The predatory roles of groups such as ctenophores, siphonophores and medusa are well known in shallow marine food webs. However, reliable, quantitative data on their distribution and population dynamics in deeper waters are scarce.

Macroscopic particles (marine snow aggregates) are an essential food resource in the ocean's interior and also serve to transport nutrients and various chemical compounds vertically and horizontally at all ocean depths. These particles are delicate and easily disrupted. Consequently, it is virtually impossible to obtain useful data on their distribution and abundance by other than *in situ* methods.

The Underwater Video Profiler (UVP) was developed to record images of macroscopic organisms (> 5 mm) and marine particles (> 0.1 mm) as deep as 3000 m depth. The instrument was conceived in the Laboratoire Océanographique de Villefranche sur mer, France and is distributed by Metal Process Ltd (www.metalprocess.com). The UVP can be used as a stand-alone vertical profiler or as a part of instrument packages (fig. 1).

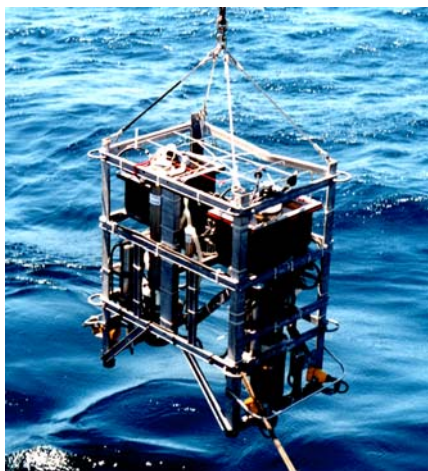


Figure 1. The Underwater Video Profiler (UVP) instrument package presented here includes a SBE CTD, a fluorometer and nephelometer both from Chelsea Instruments.

The UVP can be mounted on a CTD-rosette system or on horizontally towed gear. It can also be configured for long-term moorings. The digital image data are treated in real time *in situ* and the physical attributes of particles are stored or transferred via modem onboard (fig. 2).

Figure 2. Example of results from a vertical profile obtained by the UVP instrument package.

The UVP can operate from one to three cameras simultaneously. A pressure sensor is incorporated in each unit and the images are depth and time indexed. The laterally placed infra-red (IR) illumination is adapted for visualization of transparent objects. The entire record or only the interesting images are compressed and saved (fig. 3).

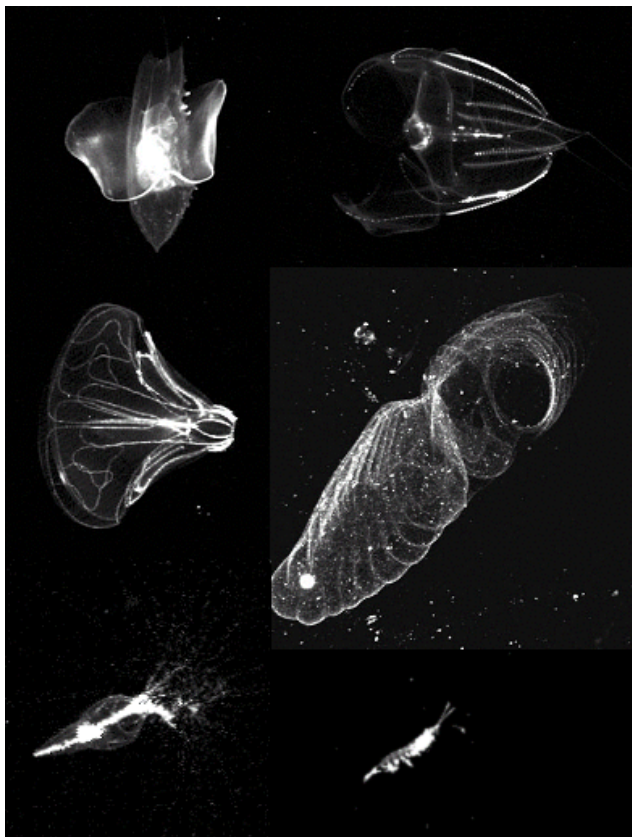
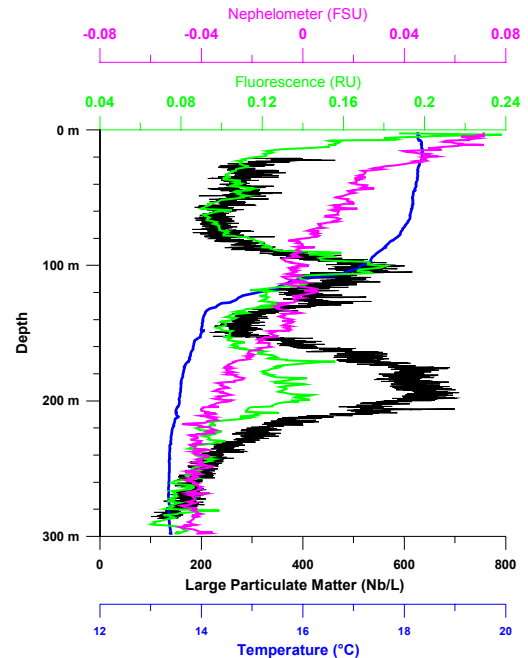


Figure 3. Macrozooplankton from the northeast Atlantic Ocean recorded during the French POMME oceanographic cruises in 2001.

The system has been utilized successfully during several oceanographic cruises and the results are published in various scientific journals:

- Echevarría, F., et al. (2002) Physical-biological coupling in the Straits of Gibraltar. *Deep Sea Res.* 10-9, in press.
- Gomez F., et al. (2001) Ecological implications of the interface oscillation and the North Atlantic Central Water in the Strait of Gibraltar. *J. Mar. Syst.*, 30: 207-220.
- Gorsky, G., et al. (in press) Marine snow latitudinal distribution in the equatorial Pacific along 180°. *J. Geophys. Res.*

- Gorsky, G., et al. (2002) Large particulate matter (LPM) in the western Mediterranean. (2002) 1-LPM distribution related to hydrodynamics. *J. Mar. Syst.*, 33-34: 274-289.
- Gorsky G., et al. (2000) Use of the underwater video profiler for the study of aggregate dynamics in the North Mediterranean. *Estuar. Coast. Shelf Sci.*, 50: 121-128.
- Gorsky, G., et al. (2000) Zooplankton distribution in four western Norwegian fjords. *Estuar. Coast. Shelf Sci.*, 50: 135-141.
- Stemmann, L., et al. (2002) Four years survey of Large Particles (>0.15 mm) vertical distribution (0-1000 m) in the NW Mediterranean. *Deep-Sea Res. II*, 49: 2143-2162.
- Stemmann L., et al. (2000) Diel changes in the vertical distribution of suspended particulate matter in the NW Mediterranean Sea investigated with the Underwater Video Profiler. *Deep Sea Res. I*, 47: 505-531.