

GLOW – The Global artificial Light Ocean netWork

Theme: Biology and Ecology

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The Global artificial Light Ocean netWork (GLOW) is a collaborative consortium of scientists studying the potential effects of artificial light at night (ALAN) on coastal assemblages worldwide. Established in Italy in Summer 2018, GLOW has attracted partners from several countries (Australia, Brazil, Canada, Croatia, France, Ireland, Spain, UK), where researchers are collecting data to quantify the intensity and quality of night lightings and their potential effects on the abundance of intertidal algae and invertebrates colonizing artificial structures.



Fig. 1: GLOW logo (by R. Gauff)

Why is it important to monitor the biological effects of ALAN on artificial structures? Armouring of the coastline is ubiquitous, due to commercial, residential, or touristic activities. Jetties, pontoons or pier pilings, seawalls, and riprap revetments or bulkheads are very common structures used to support human activities and assets, and all represent new habitats for a plethora of organisms. These man-made structures are usually brightly lit at night for security reasons (Bulleri and Chapman 2015). Increases in human population and global climate changes will cause coastal artificial structures to proliferate, thus replacing natural habitats with light-polluted coastal systems.

Activities of the GLOW network are based on the application of a concise protocol, that includes both diurnal and nocturnal samplings replicated twice (i.e., 2 dates) within the Summer and Winter seasons, at both lit and unlit areas, and focuses on measures of artificial lighting (by means of SQMs and light meters) as well as visual estimates of abundance of sessile and mobile organisms (including crabs). Optional activities related to sampling during additional moon phases, sampling microbial biofilm (Maggi et al. 2020) and using additional instruments to quantify properties of ALAN (LAN3; Aubé et al. 2020) are presented.

Variability observed among locations and between seasons in the difference in abundance of organisms between lit and unlit areas are discussed, by considering possible natural or anthropogenic drivers, with a focus on potential interactions between ALAN and other disturbances related to urbanization in coastal areas (Maggi et al. *in prep*, ECOLight working group - <https://www.euromarinenetwork.eu/activities/emergent-impacts-coastal-areas>).

References

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