

Appendix 1. Sources of light at night

Light pollution is a by-product of industrial civilization, which alters the natural patterns of light and dark in ecosystems and includes direct glare, and chronically increased illumination; all of which can disrupt terrestrial, freshwater, and marine ecosystems to varying degrees (Longcore and Rich 2004).

- Light pollution by urban development includes street lights, illuminated buildings, bridges and towers, commercial advertising, factories, parking places, airports, flaring of natural gas, sky beamer, illuminated sporting venues, and also car headlights. It is most distinct in industrialized, densely populated areas of Europe, North America, and Japan and in metropolises in the Middle East and North Africa (e.g. Cinzano et al. 2001, Longcore and Rich 2004, Elvidge et al. 2007).
- The main sources of artificial light in marine environments include vessels, lighthouses, fisheries using light to attract fish (e.g. squid fisheries), as well as gas flares at oil and gas platforms (offshore gas flaring) (e.g. Cinzano et al. 2001, Elvidge et al. 2007, Elvidge et al. 2009).

LITERATURE CITED

Cinzano, P., F. Falchi, and C. D. Elvidge. 2001. The first world atlas of the artificial night sky brightness. *Monthly Notices of the Royal Astronomical Society* **328**: 689–707.

Elvidge, C. D., P. Cinzano, D. R. Pettie, J. Arvesen, P. Sutton, R. Nemani, T. Longcore, C. Rich, J. Safran, J. R. Weeks, and S. Ebener. 2007. The Nightsat mission concept. *International Journal of Remote Sensing* **28**: 2645–2670.

Elvidge C. D., D. Ziskin, K. E. Baugh, B. T. Tuttle, T. Ghosh, D. W. Pack, E. H. Erwin, and M. Zhizhin. 2009. A fifteen year record of global natural gas flaring derived from satellite data. *Energies* **2**: 595-622.

Longcore, T., and C. Rich. 2004. Ecological light pollution. *Frontiers in Ecology and the Environment* **2**:191–198.