



Plymouth Marine  
Laboratory



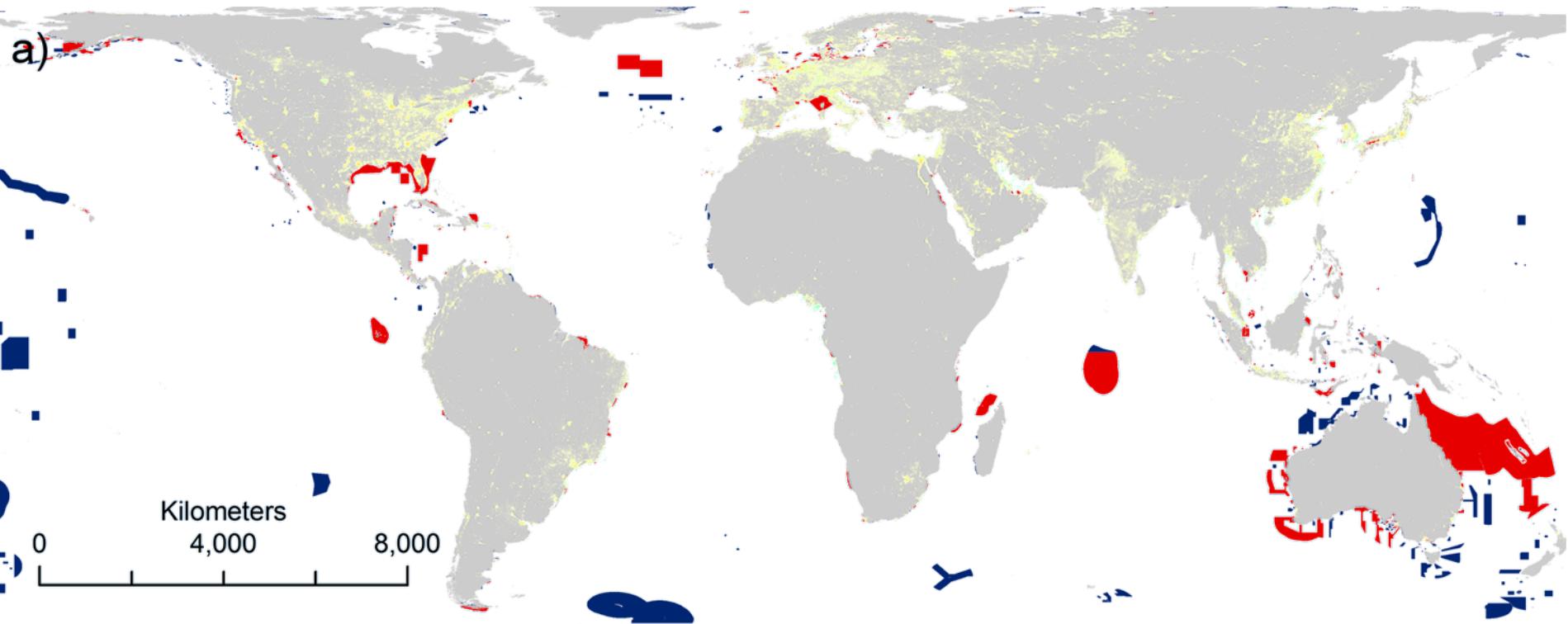
# Artificial night-time light alters trophic interactions of intertidal invertebrates

Thomas Davies (Exeter), Ana Queirós (PML) and  
Charlotte Underwood (Exeter)



22% of the worlds coastlines (Davies *et al.*, 2014, *Frontiers in Ecology and the Environment*)

**Lit** **Unlit**

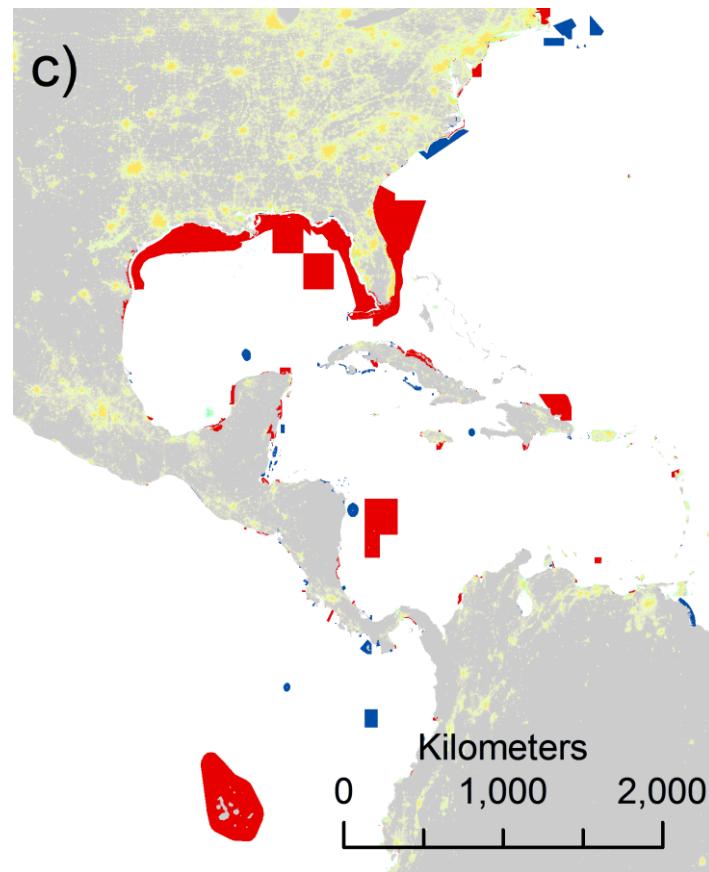
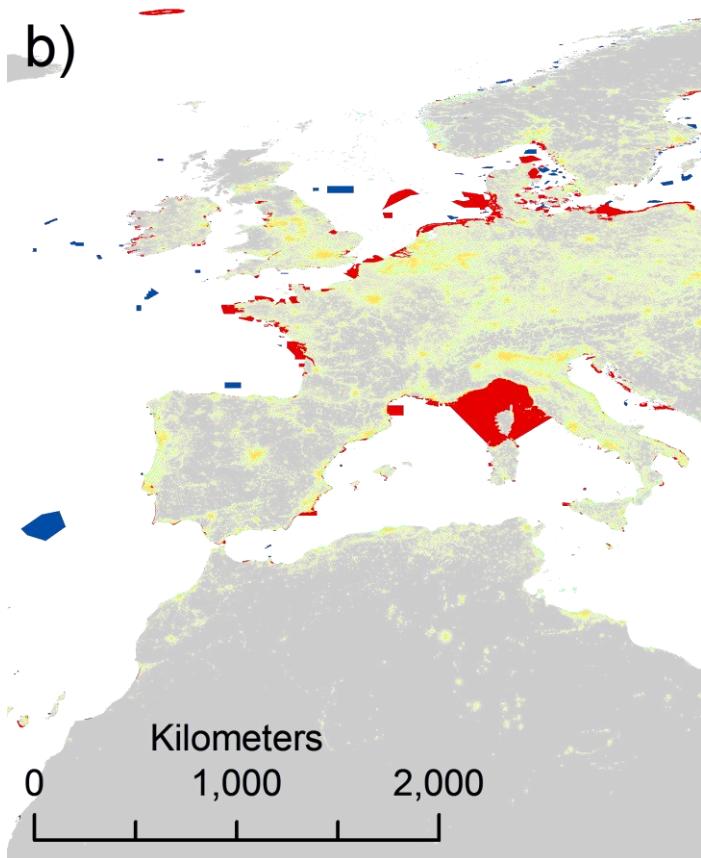


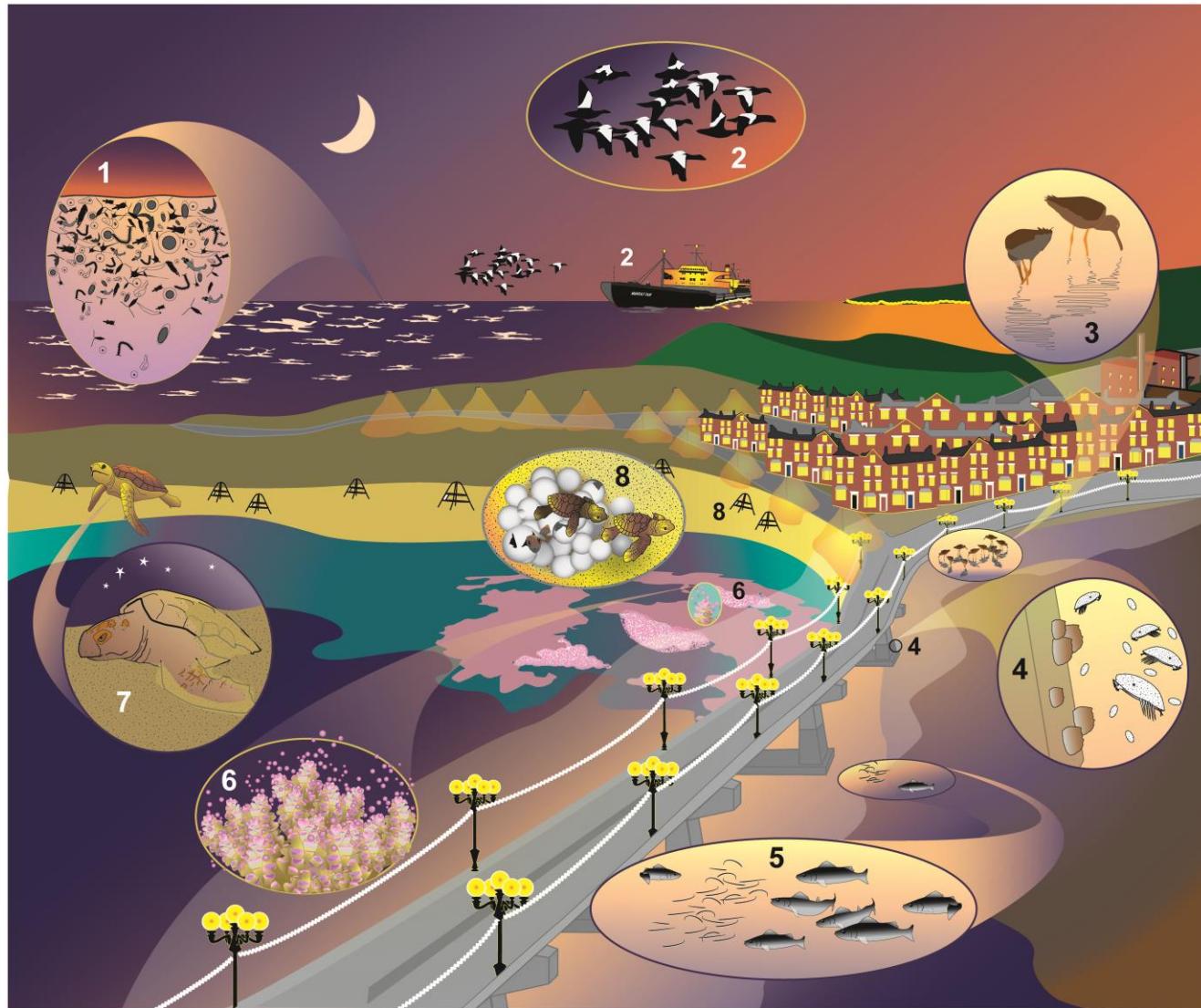
35% of the world's MPAs

20% exposed across 100% of their area

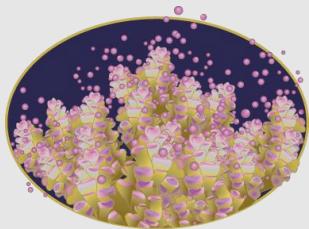
Davies *et al.* (2015) *Conservation Letters*, 9, 164-171.

**Lit** **Unlit**

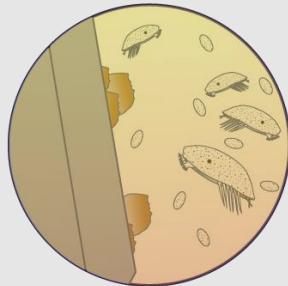




Davies *et al.* (2014) *Frontiers in Ecology and the Environment*, **12**, 347-355.



**Phenology** – lunar synchronicity of broadcast spawning



**Recruitment** – habitat selection by invertebrate larvae



**Foraging /predation** – efficiency and daily patterns of activity



**Movement** – daily migration patterns



## Is coastal lighting affecting night-time foraging behaviour in the common dogwhelk *Nucella lapillus*?

£2,458 PML-Exeter Collaboration fund (start Mar-2015)

Lab consumables, Travel and Accommodation (Student)

Outputs:

1 Publication



UK Ocean Acidification  
Research Programme



DAY

Night

DAY

LED



Night



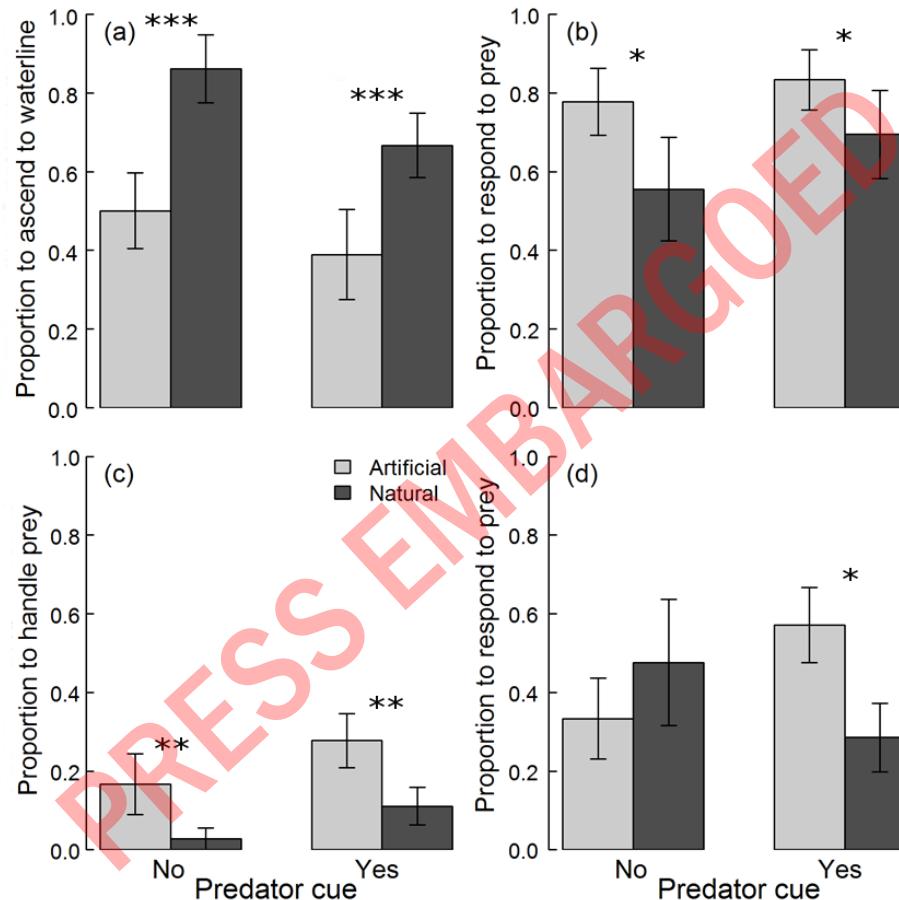
LED

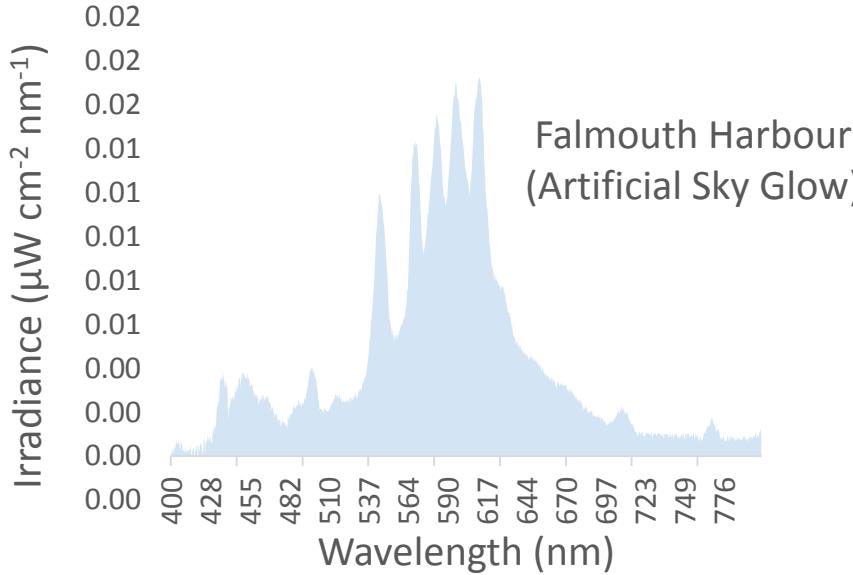
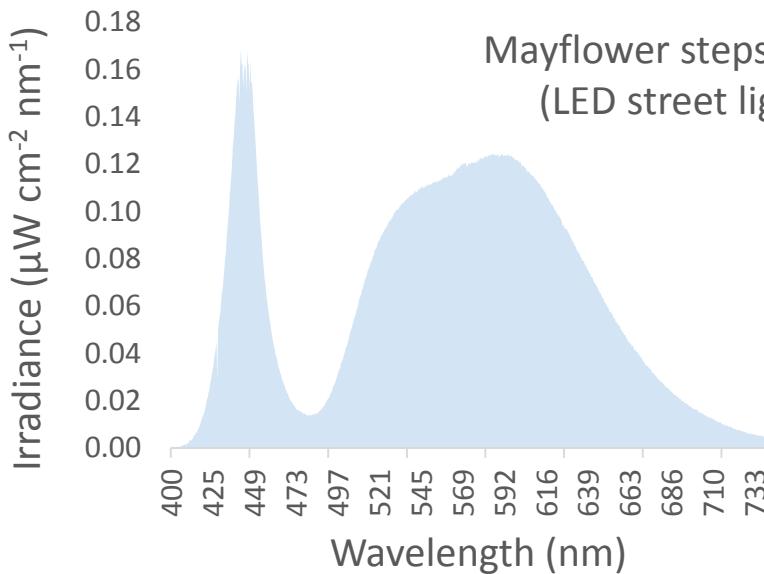


# Artificial night-time light alters trophic interactions of intertidal invertebrates

Charlotte N. Underwood<sup>1,2</sup>, Thomas W. Davies<sup>\*,2</sup>  and Ana M. Queirós<sup>3</sup> 

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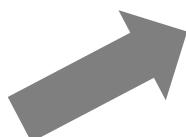
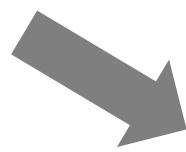




## Radiative Transfer Models

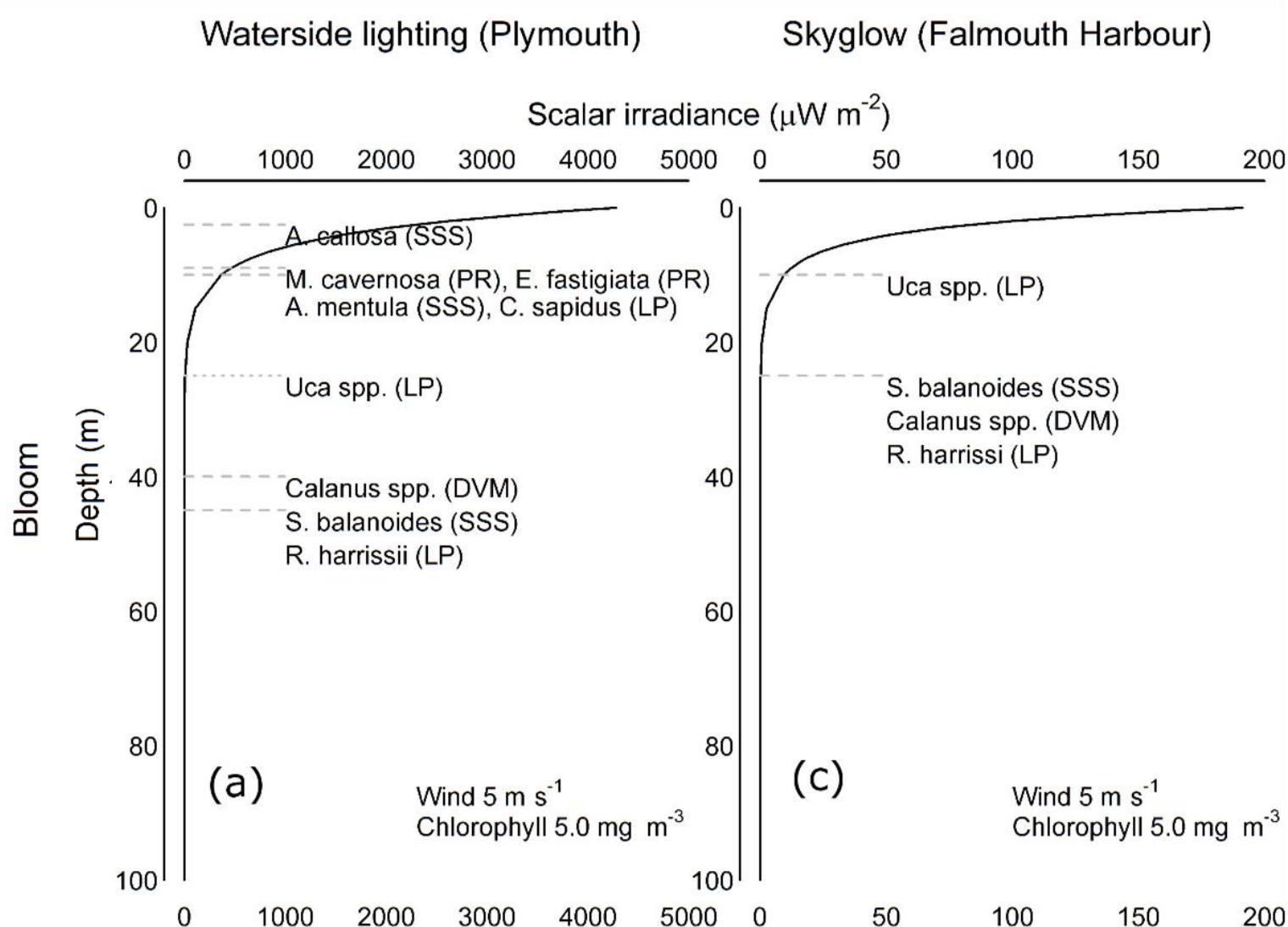
### Bloom:

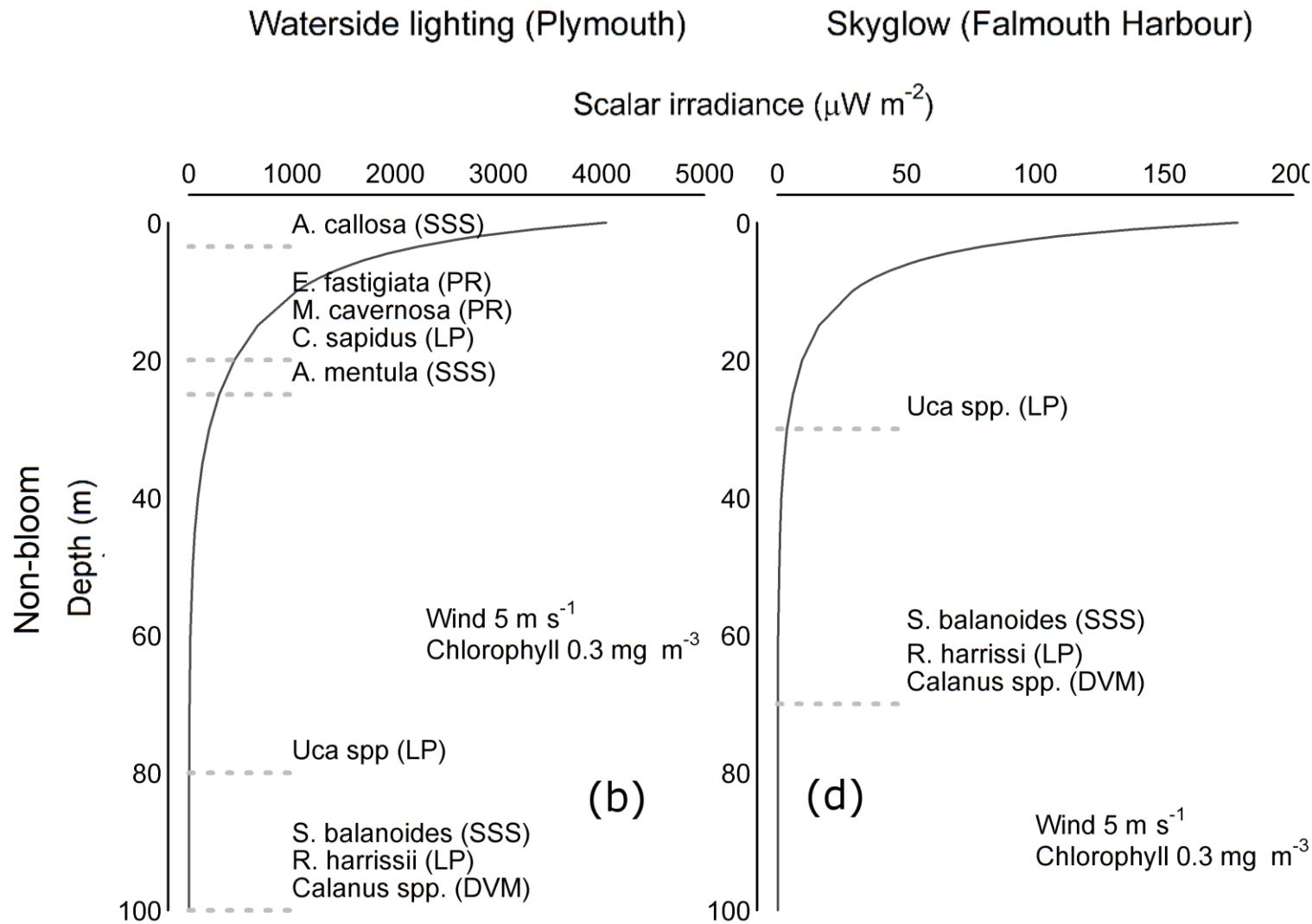
- Wind  $5\text{ m s}^{-1}$
- Chlorophyll  $5\text{ mg m}^{-3}$



### Non-bloom:

- Wind  $5\text{ m s}^{-1}$
- Chlorophyll  $0.5\text{ mg m}^{-3}$





# Summary



- £2,458 funding from the collaboration fund (2015)
- Successful completion of one MSc project
- 2 publications, one in press, one in review
- Pilot data → 2 grant proposals