

# Vertical distribution of the pyrosome *Pyrosoma atlanticum* off the US West Coast from camera profiles and depth-stratified net tows

Joanna Lyle<sup>1</sup>, Robert Cowen<sup>2</sup>, Su Sponaugle<sup>2</sup> and Kelly Sutherland<sup>1</sup>

1. Oregon Institute of Marine Biology, University of Oregon,

2. Hatfield Marine Science Center, Oregon State University

## BACKGROUND

- Unprecedented bloom of *Pyrosoma atlanticum*, a tropical pyrosome, in the Northern California Current (NCC)
- Bloom peaked in 2017 off Oregon, exceeding 60,000 kg/km<sup>3</sup> (Brodeur et al., 2018)
- Vertical distribution patterns not yet explored



*P. atlanticum* colonies collected in March 2018

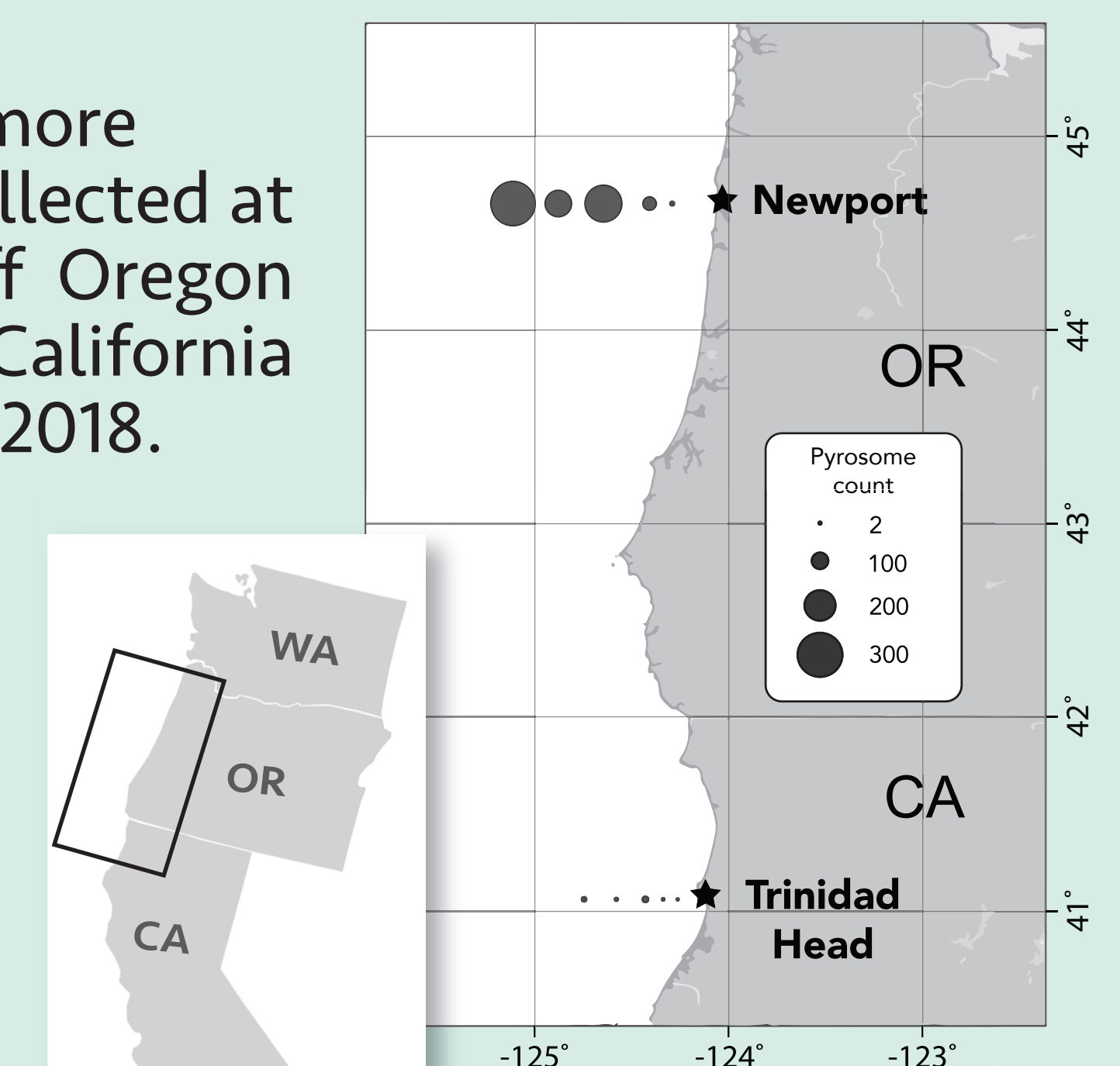
## QUESTIONS

1) How are pyrosomes vertically distributed in relation to water column structure?

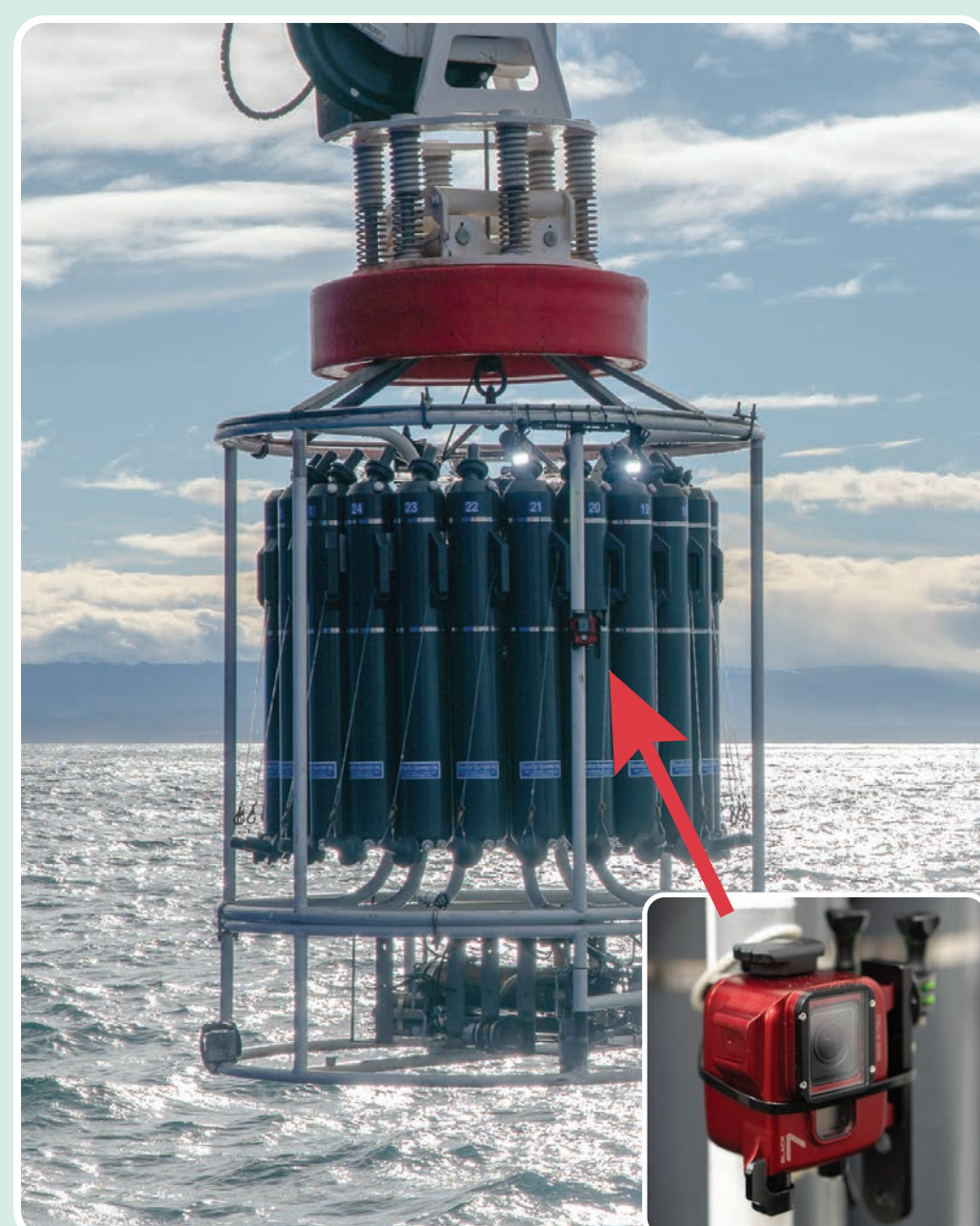
2) Do NCC pyrosomes exhibit diel vertical migration?

## SAMPLING SITES

Relatively more colonies collected at stations off Oregon (816) than California (60) in July 2018.

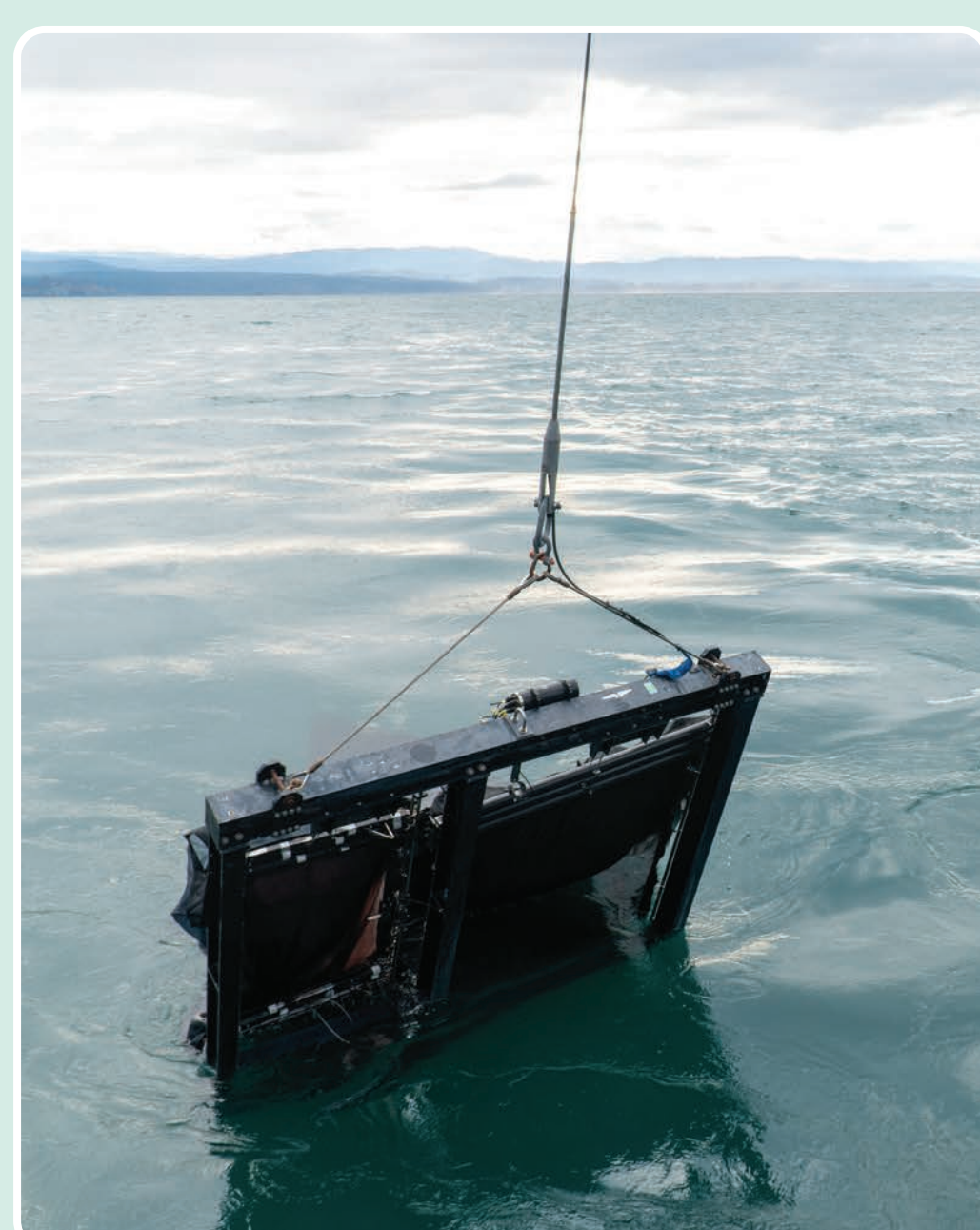


## METHODS



### CTD-MOUNTED CAMERA

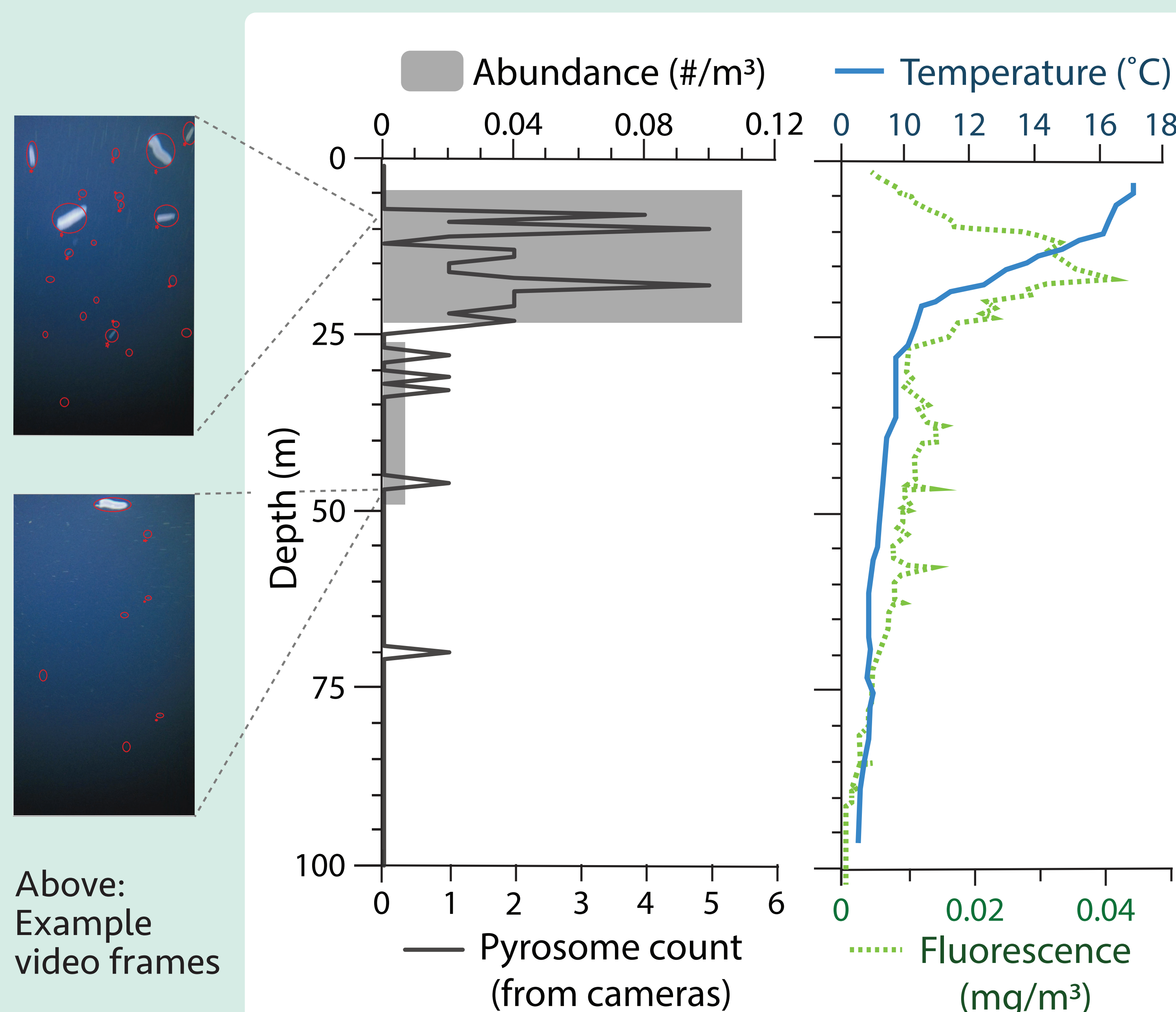
Vertically deployed camera mounted on CTD-rosette to get fine scale (1 m) in situ counts



### DEPTH STRATIFIED NET TOWS

Towed MOCNESS net system to sample abundance and biovolume at a coarse scale (25 m)

## VERTICAL DISTRIBUTION



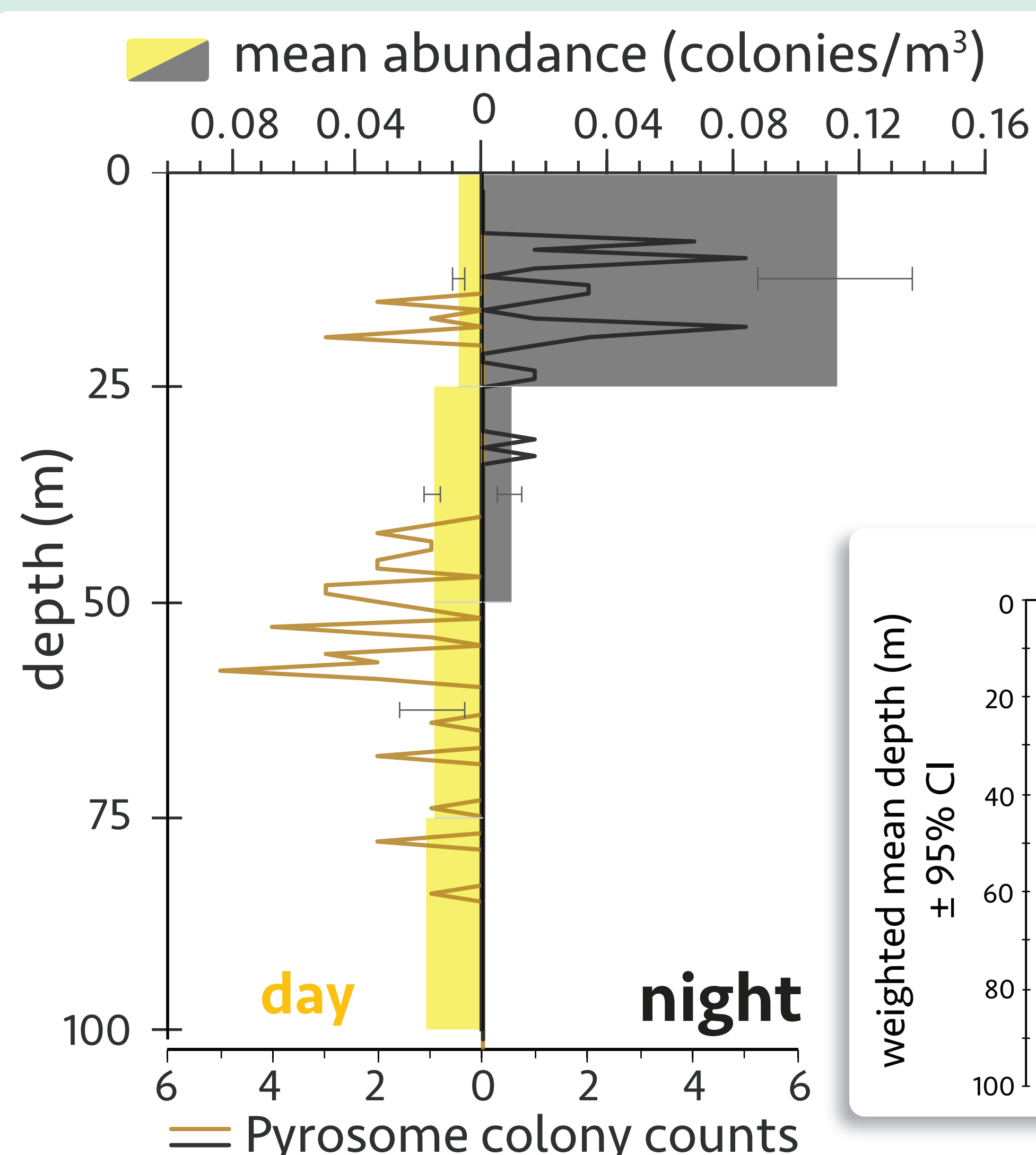
Above: Example video frames

- Fine-scale counts from cameras allows us to compare the vertical distribution of pyrosomes with water column features

- We observed pyrosomes aggregating near the base of the surface mixed layer and fluorescence peaks.

Left: Comparison between the vertical distribution of pyrosomes and the temperature and fluorescence profiles at the most offshore night station on the Newport, OR transect in July 2018.

## DIEL VERTICAL MIGRATION



Pyrosome colonies were positioned deeper in the water column during the day ( $45.7 \pm 3.4$  m) than at night ( $16 \pm 2.7$  m) (weighted mean depth  $\pm$  SE)

Left: Comparison between day/night distribution at the most offshore Oregon Station in July 2018. Bars are abundances from MOCNESS tows. Lines are in situ counts from vertically deployed cameras.

inset: Comparison of day/night weighted mean depth  $\pm$  95% CI of colonies collected in July 2018 from all MOCNESS tows (5 stations on each transect).

## CONCLUSIONS

- Vertically-deployed cameras reveal fine-scale vertical distribution patterns
- Net tows supply coarse-scale abundances and validate video counts
- Future direction: Stereo-cameras create opportunity to measure colony size and abundance in situ
- Evidence of diel vertical migration in NCC pyrosomes. Migrations may impact food web dynamics through increased carbon export

### THANKS TO:

M. Farley, M. Gimpelevich, H. Sorensen, Crews of R/V Sally Ride & R/V Sikuliaq Brodeur, R. D., & Perry, I. (2018). PICES Press.

