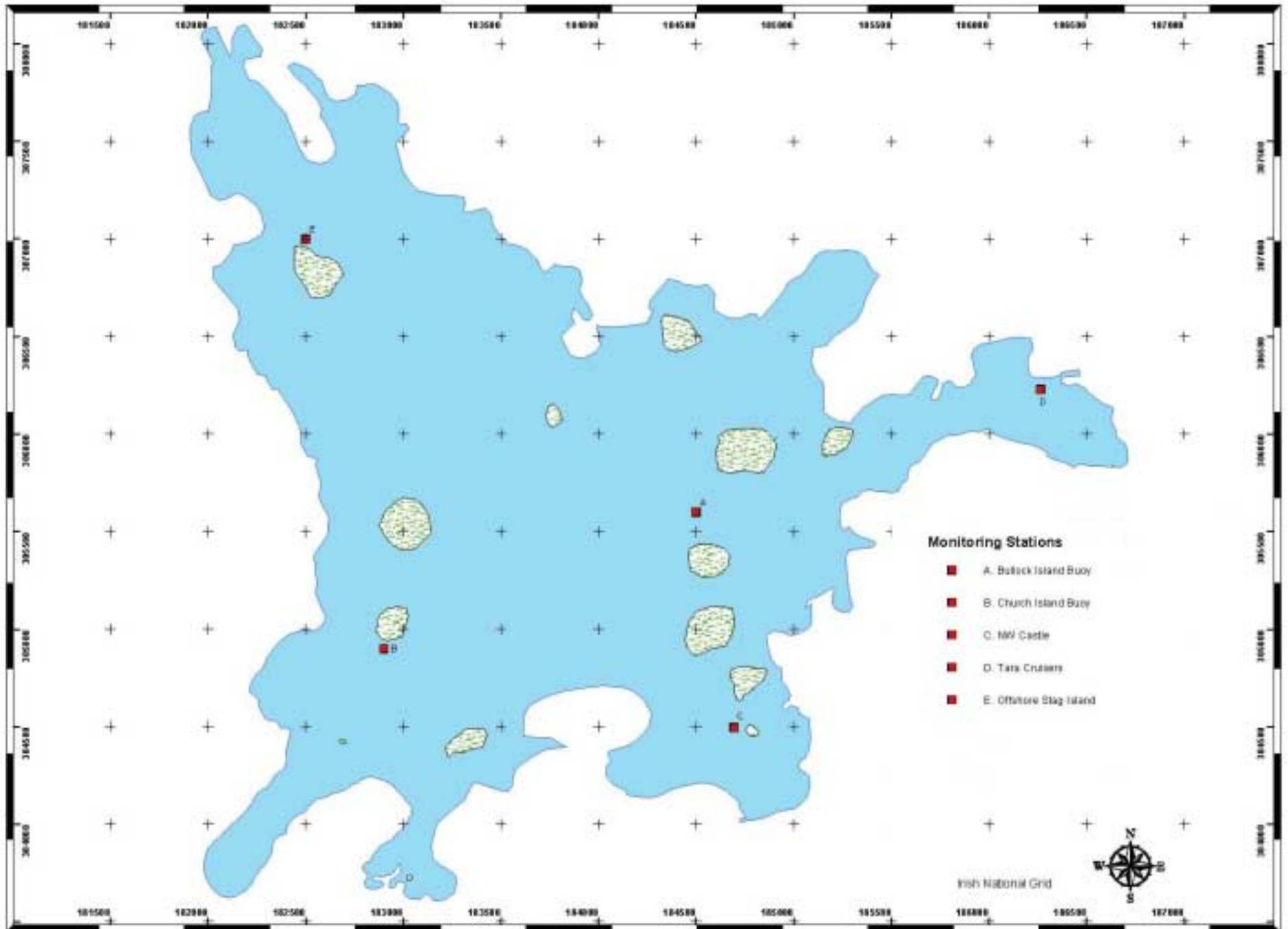




SLIGÉAC

Early Life Stages of Zebra Mussels: The Importance of Long-term Data Sets in Invasion Ecology

Frances Lucy
I.T. Sligo, Ireland



Methodology 1998-2005

- Larvae/veligers sampled with a 64 μ m net
- Three metre vertical tows
- Larval density and size distributions analysed in laboratory using cross-polarised light
- Settlement estimated using 15cm² grey PVC plates suspended at 3m+

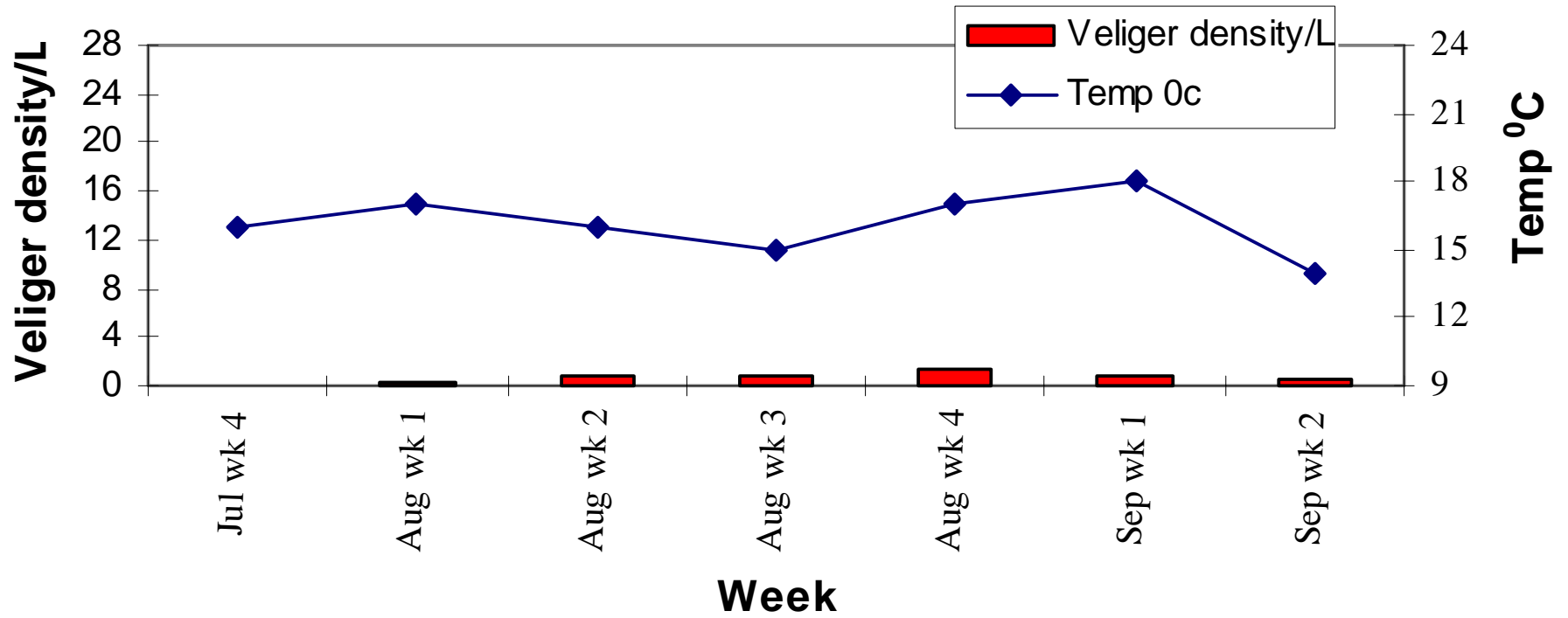
Spawning Season

- Spawning observed once water temperature reaches 15⁰C
- Main spawning season from mid-June to first week in September
- Maximum larval density coincided with maximum water temperature in some years (2001-2003) but not in other years (1998-2000, 2004-2005)

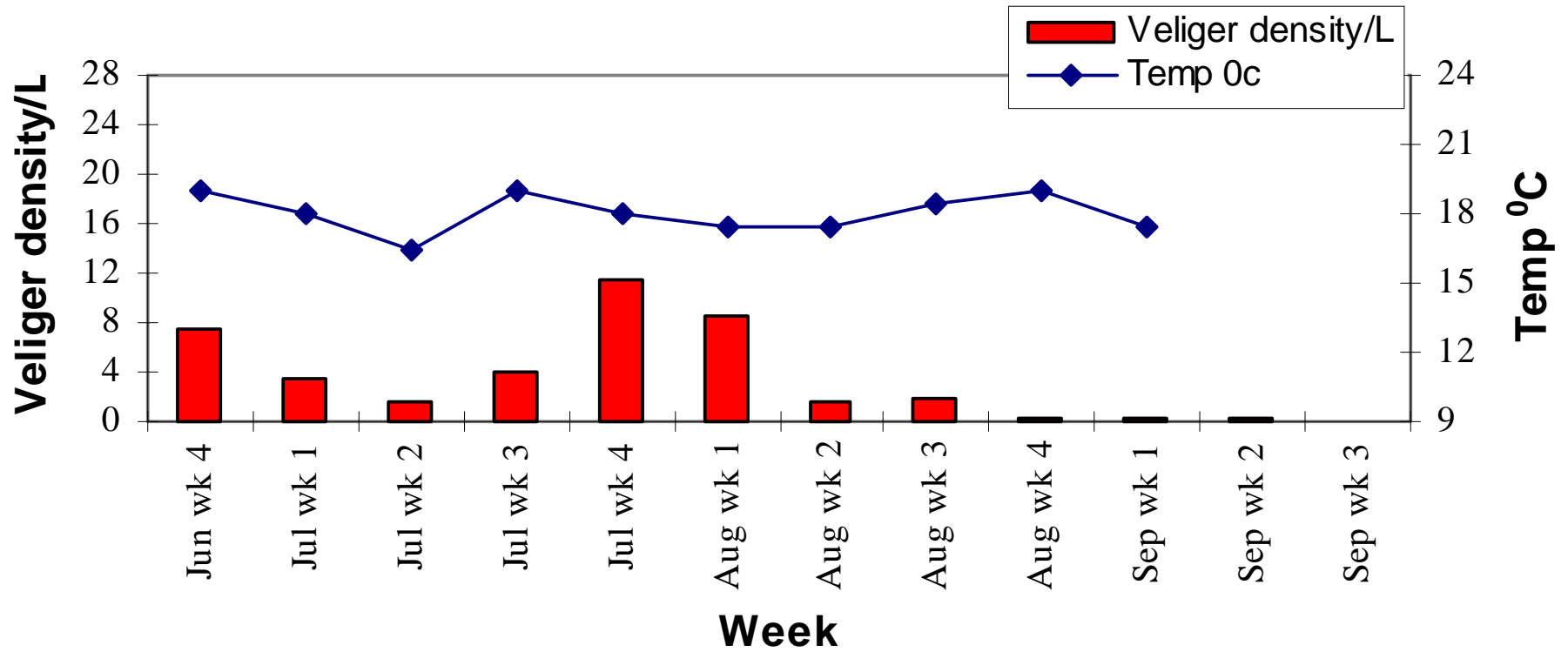
Other Environmental Factors

- Patchy distribution of larvae
- Vertical distribution of larvae
- Wind induced currents
- Periods of settled weather

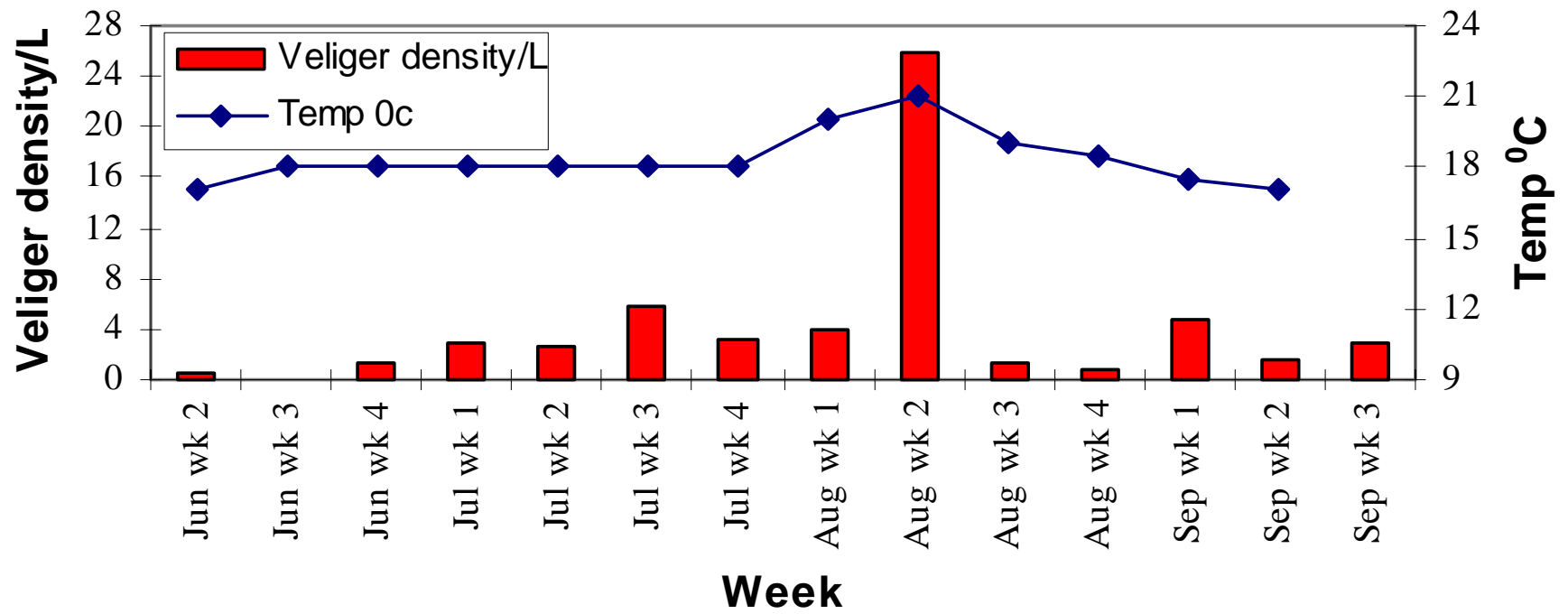
Veliger density/L 1998



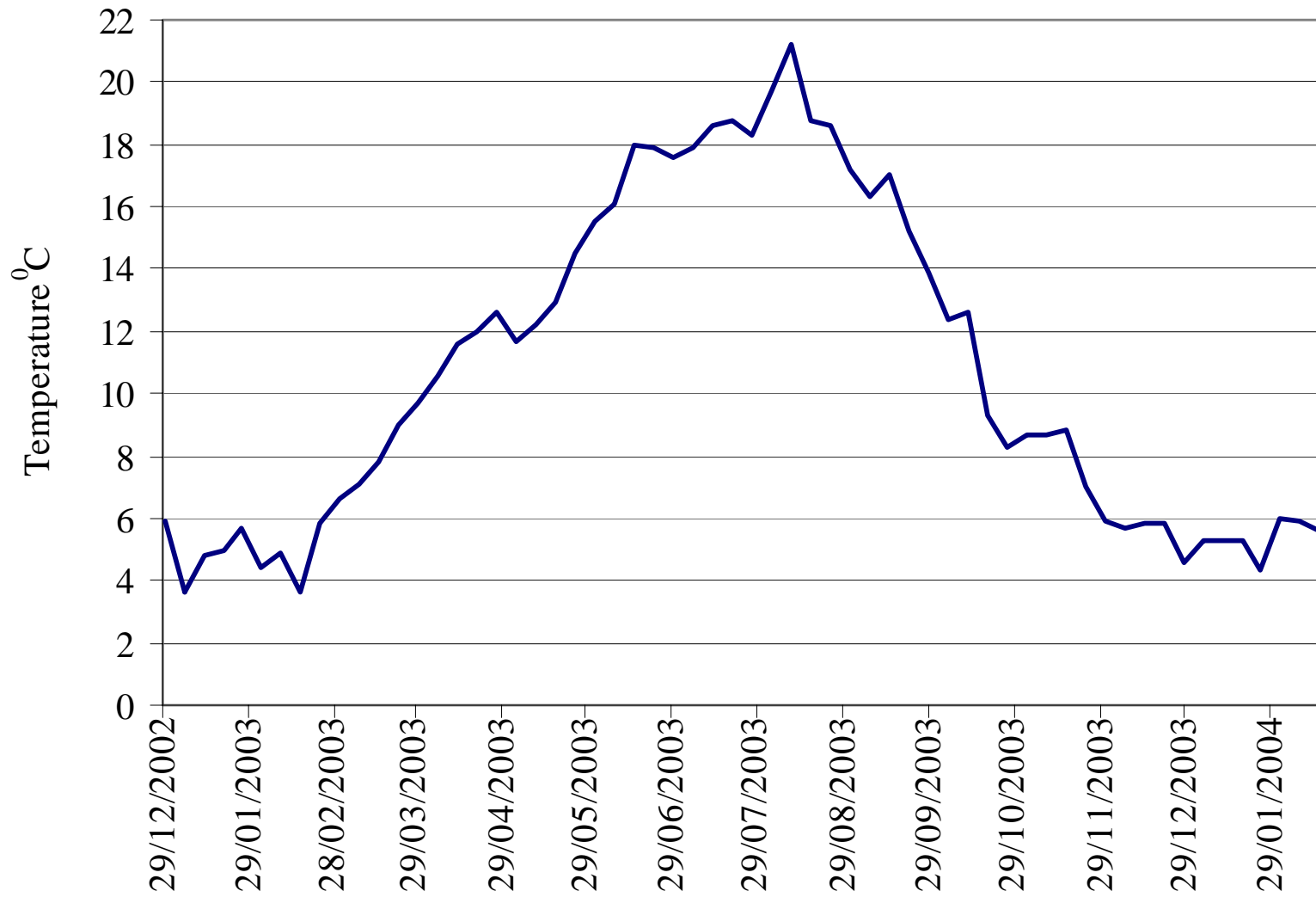
Veliger density/L 2000



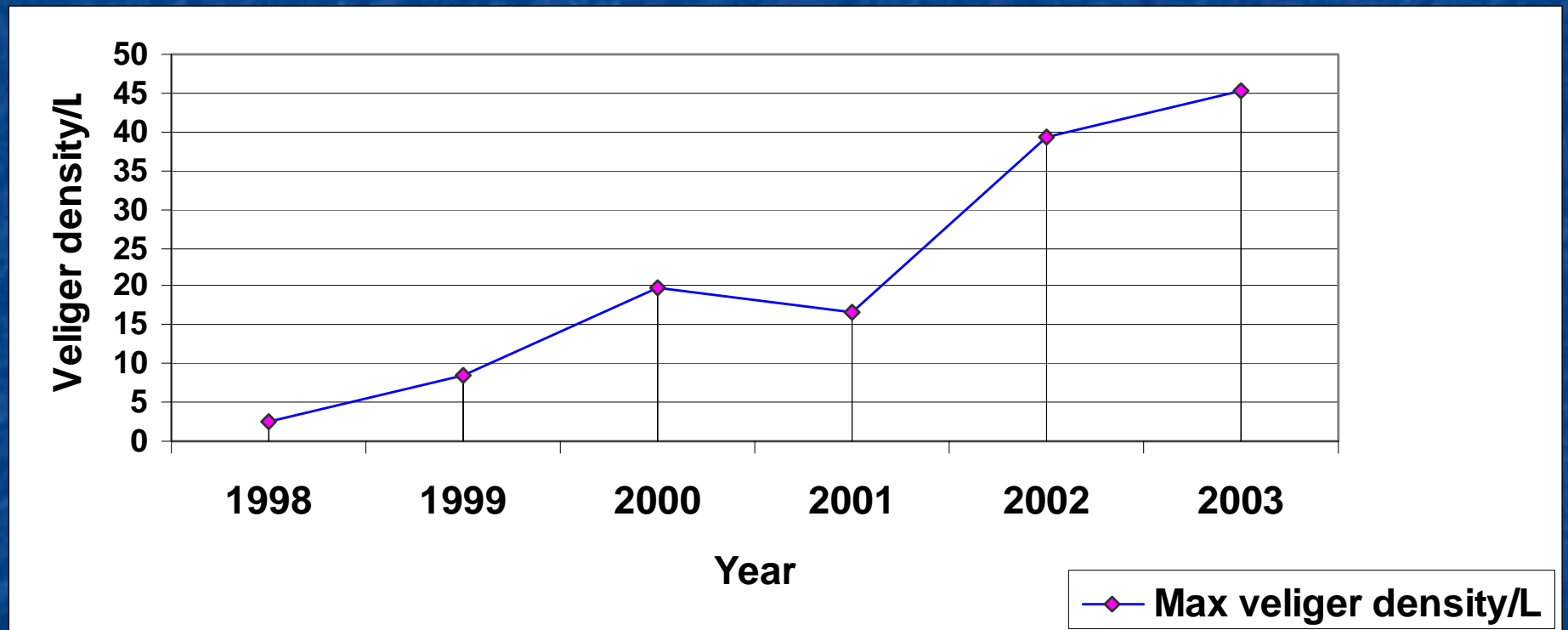
Veliger density/L 2003



January 2003-February 2004



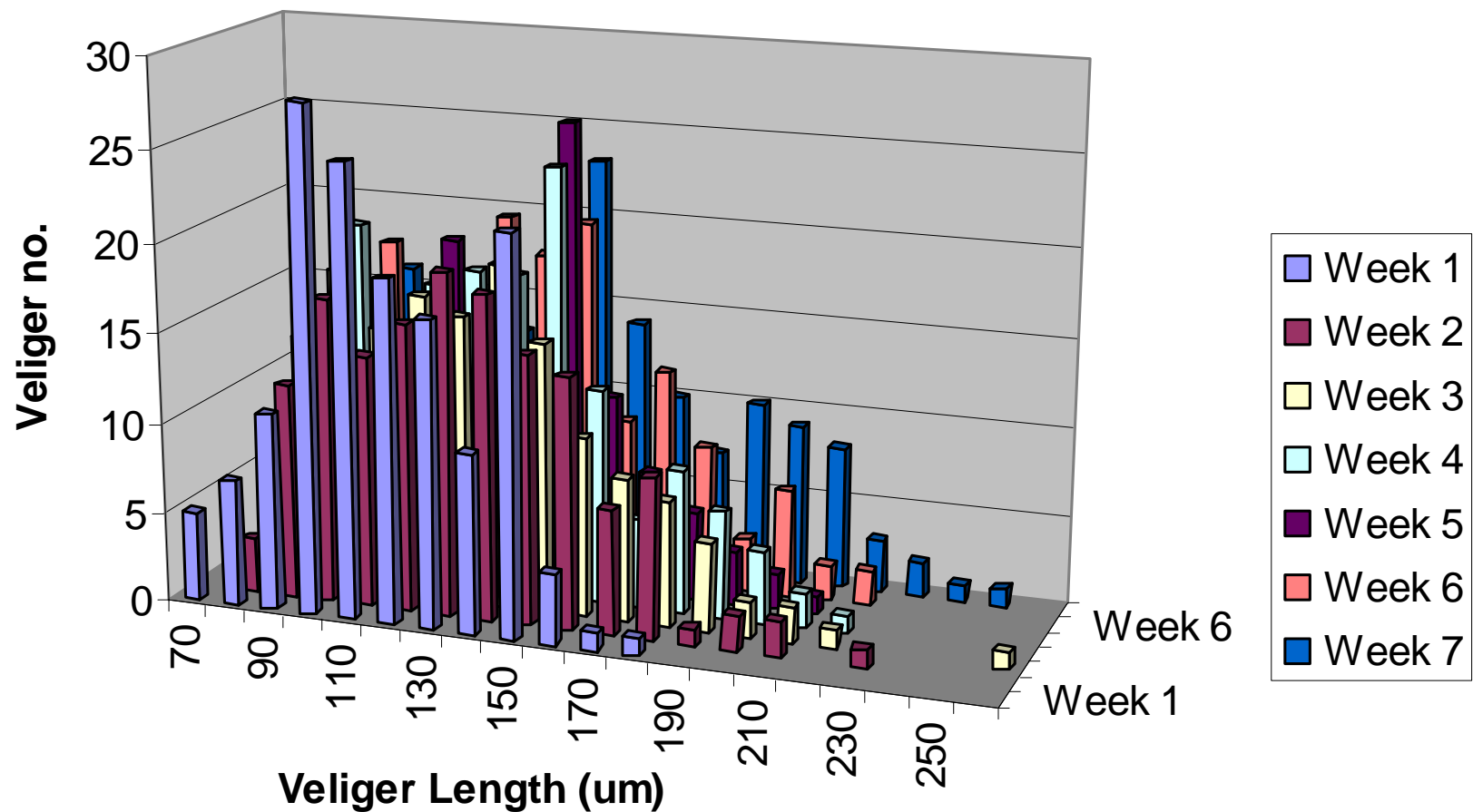
Peak Veliger Density



Size Distributions

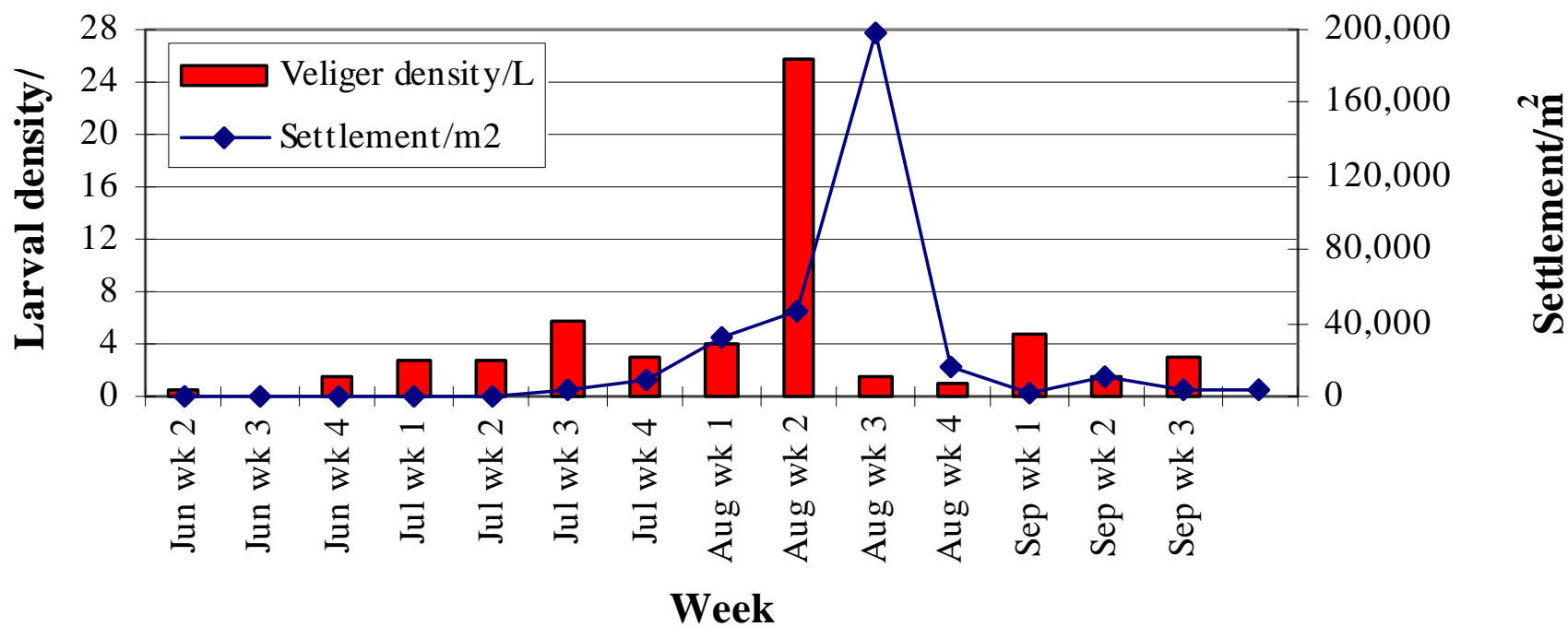
- Bridge information between veliger and settlement stages
- Majority of veligers were 100-150 μm
- Small mean sizes mid-season indicate spawning pulses
- Significant difference between sizes in sequential weeks as large veligers settled out
- Significant difference between sizes in same week in different years

Weekly Size Distribution 2005

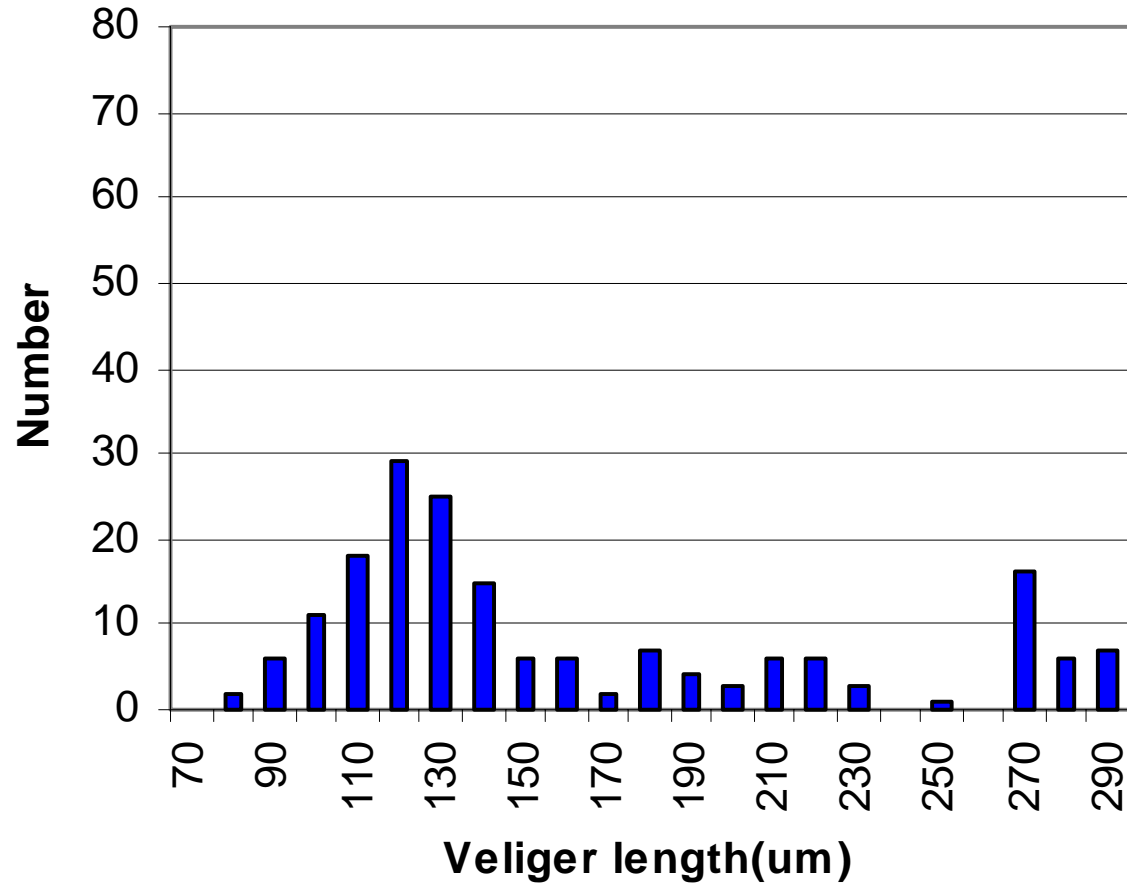




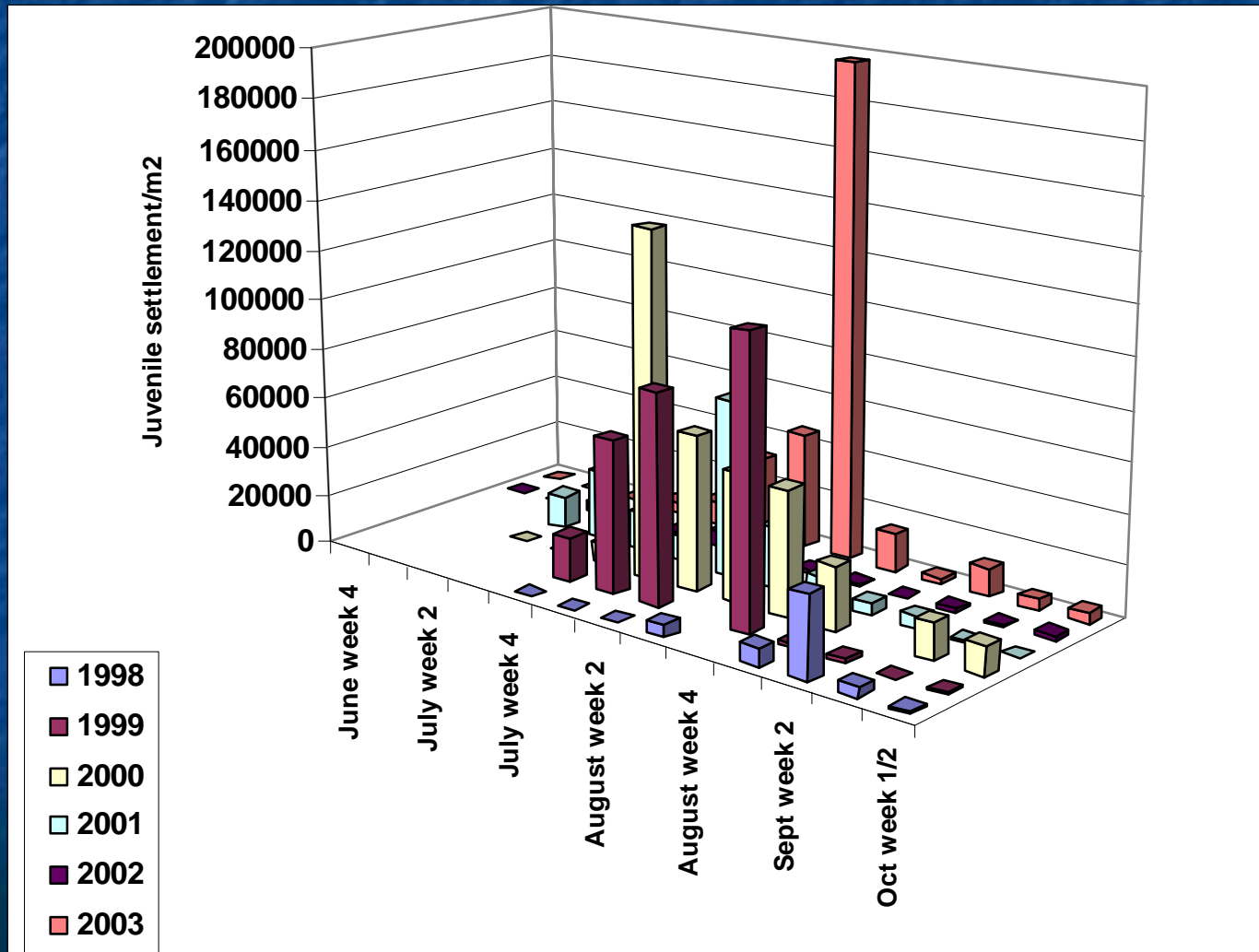
Settlement and Larval Density 2003



Aug week 2 n=150



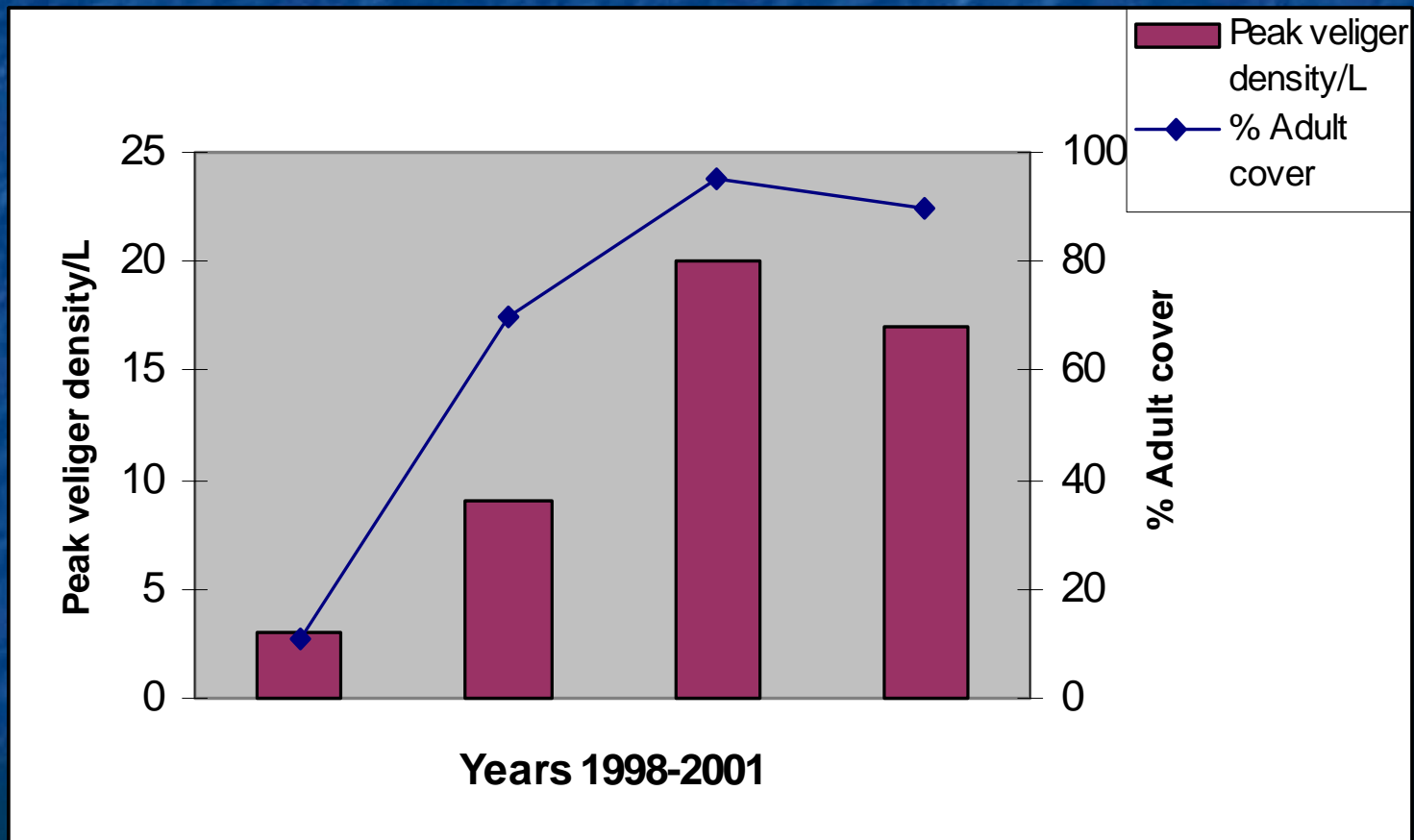
Seasonal Settlement 1998-2003



Recruitment is the Key!

- Although larval density was relatively low, very high settlement in early years of invasion led to successful recruitment
- This resulted in an exponential increase in the Lough Key zebra mussel population

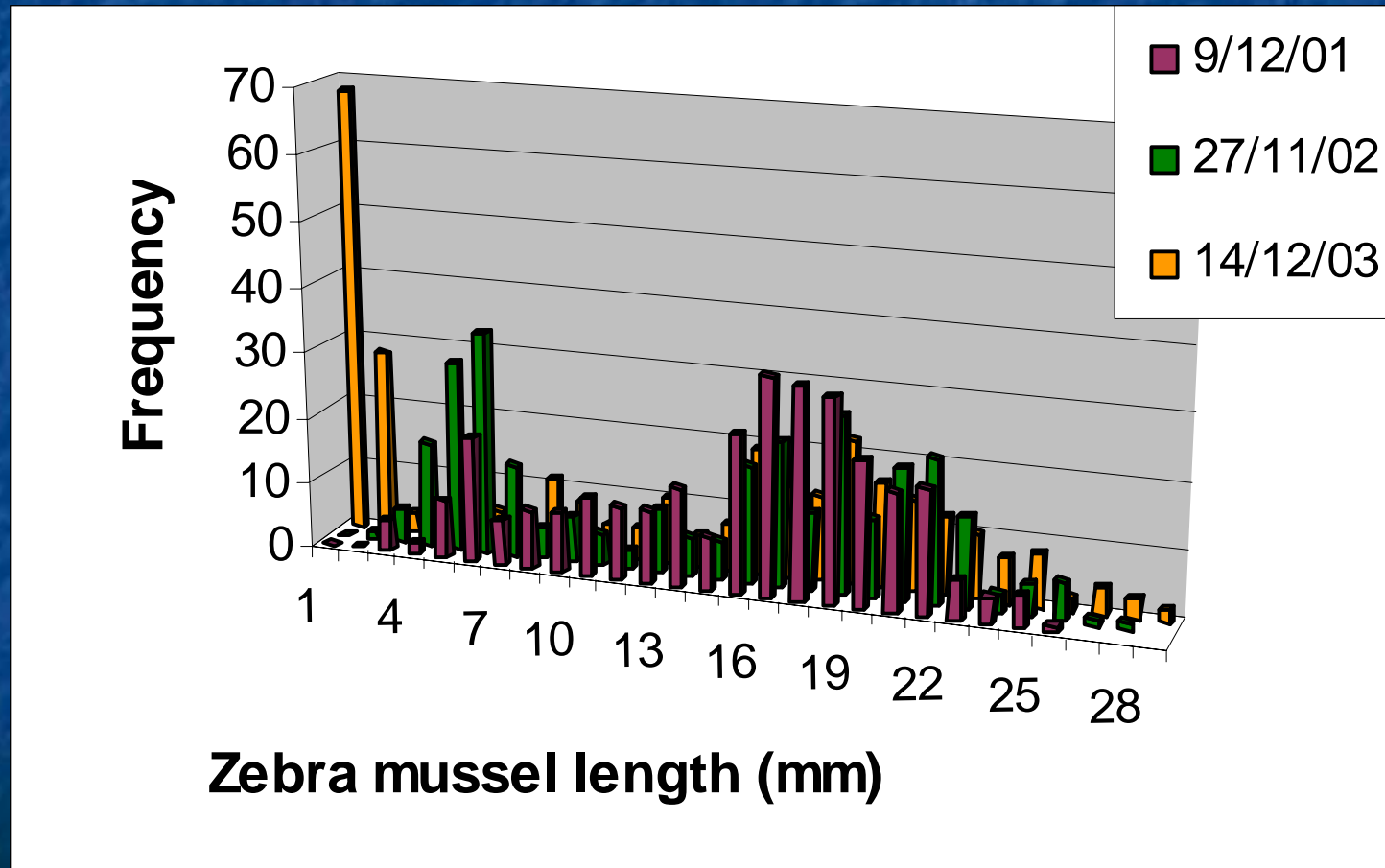
Larval Density and Recruitment



Population Studies

- Lower recruitment in later years was probably due to lack of food resource for veligers
- Adult population is currently relatively stable and the population is sustainable

Adult size distributions



Conclusions

- Low larval densities in early invasive stages were followed by high levels of recruitment
- Both settlement and adult biomass data show that increased larval densities did not result in greater recruitment once the lake population had stabilised

Conclusions

- Long term monitoring programmes can indicate whether the population will remain stable
- Early life patterns will reflect changes in water temperature regimes
- Knowledge of seasonal patterns is useful for increased ecological understanding of pelagic and benthic foodwebs

Thanks to the Measurers!

- ❖ Elaine Ni Chonmhara
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