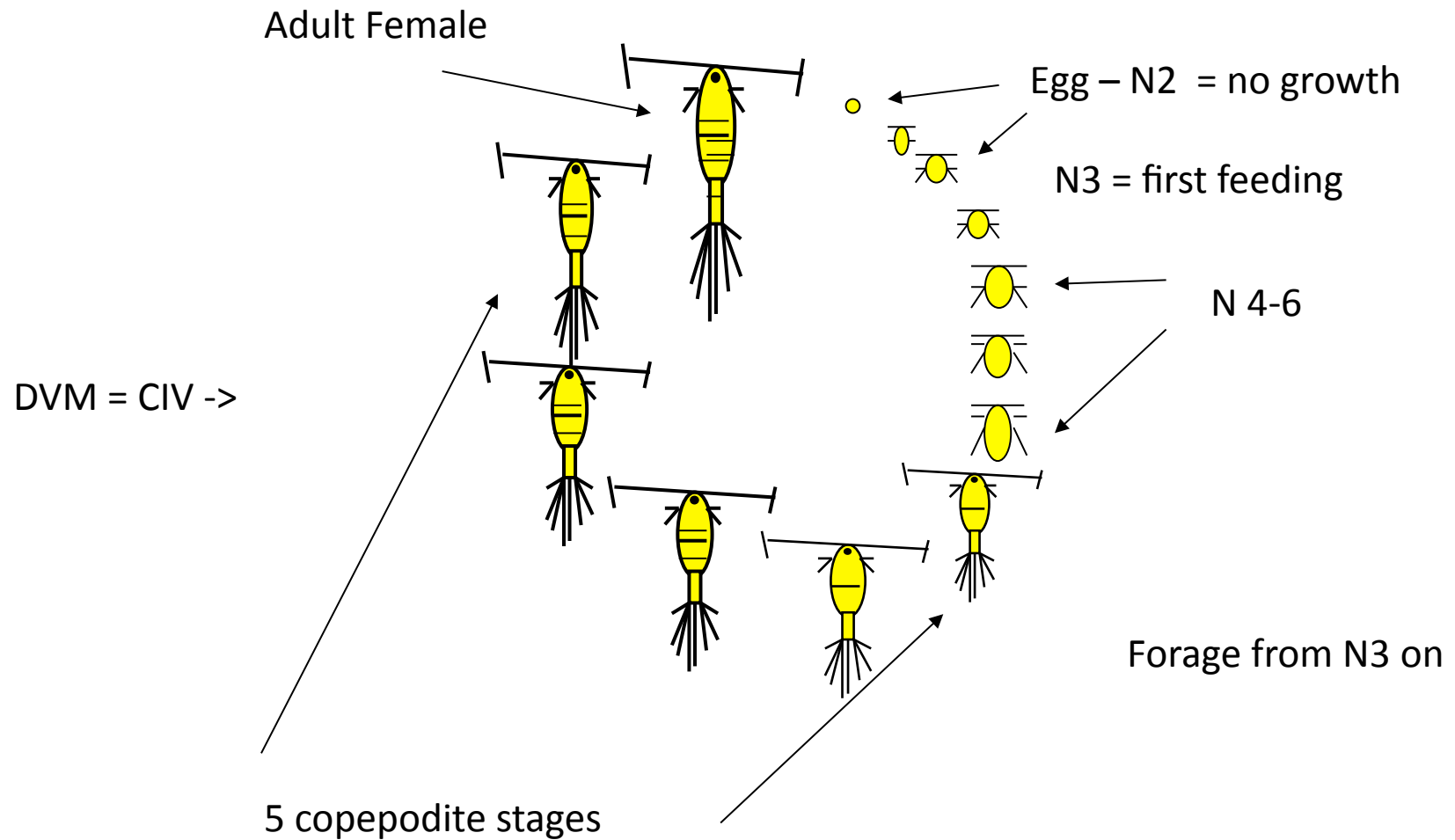
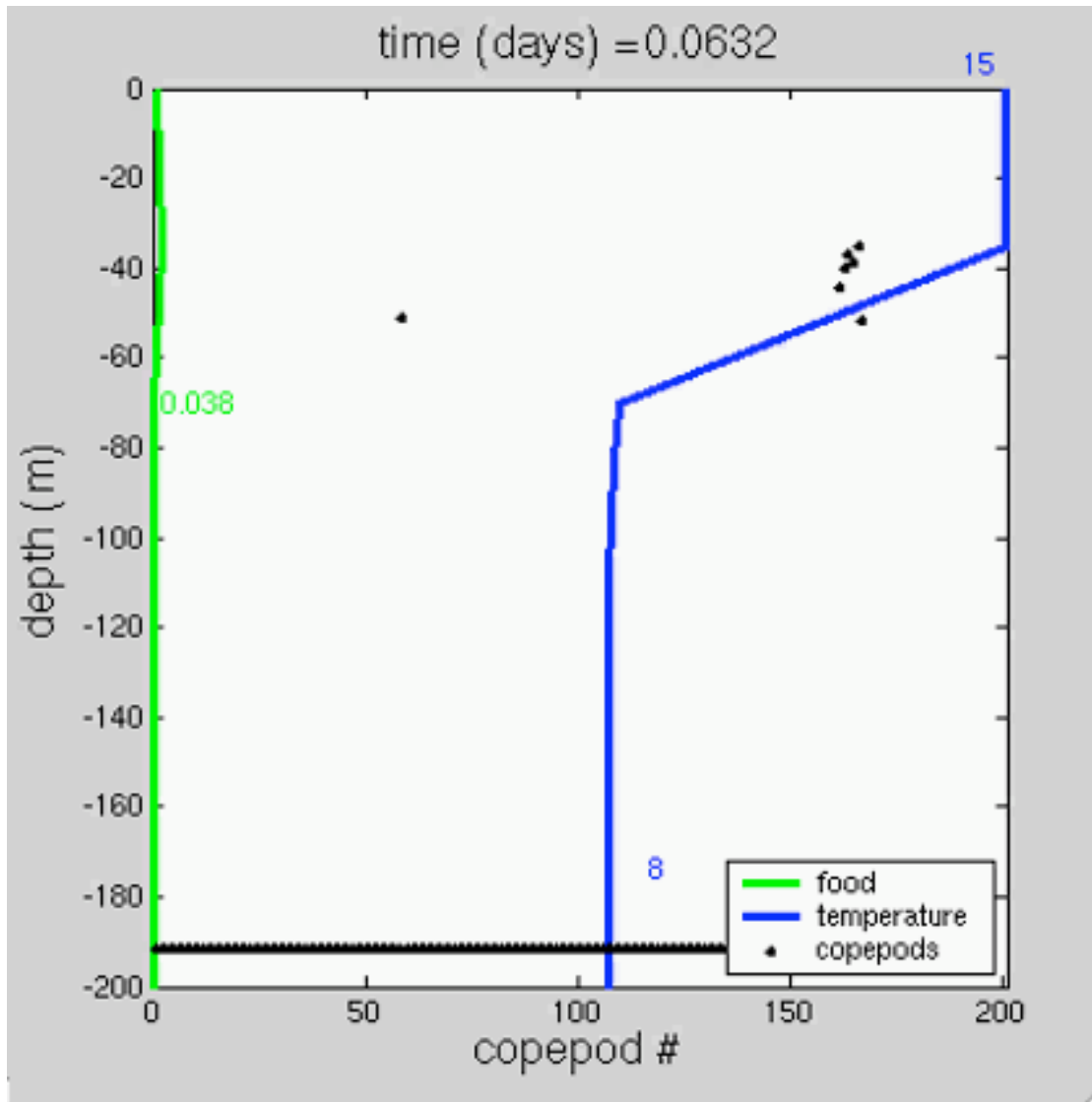


The Calanus model: 101



Model physical setup



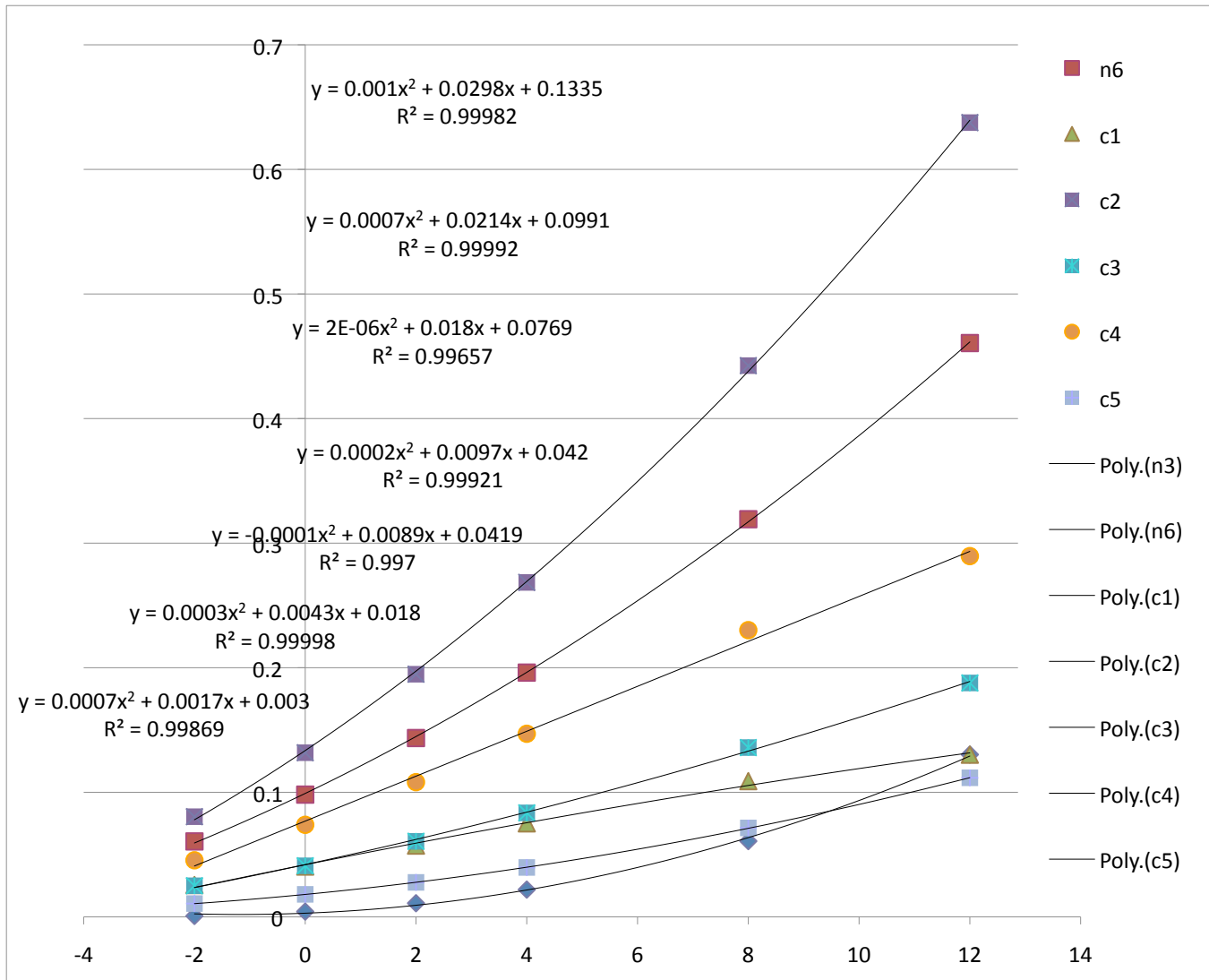
12 dynamic layers:

- 2 layers within mixed layer, spaced equally
- 10 layers from MLD to bottom, spaced evenly

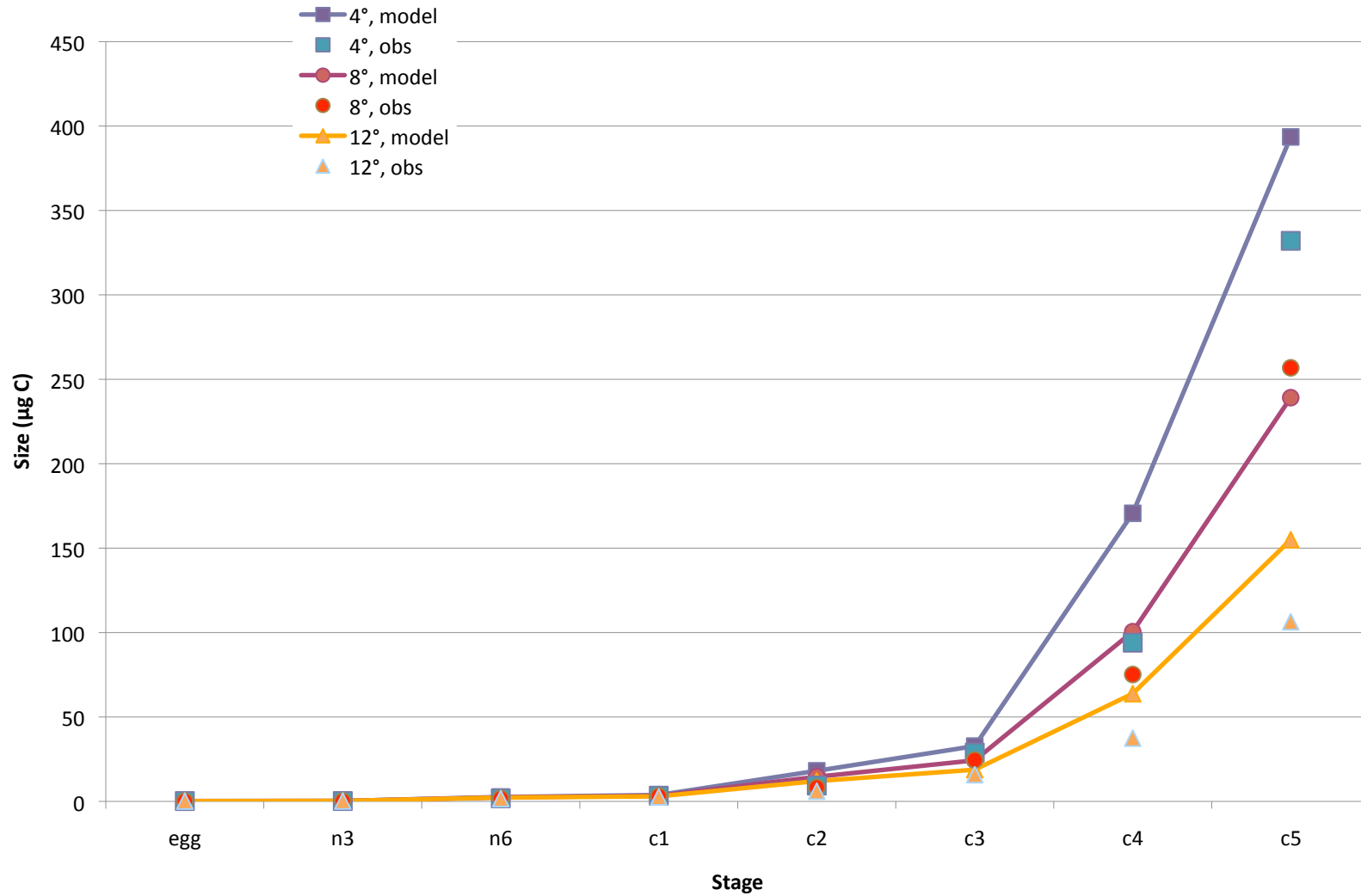
DVM between deep layer and within MLD 12:12 hr

Dormant at selected depth range

MAX Growth rate Vs Temperature



Calanus finmarchicus size at stage vs Temperature

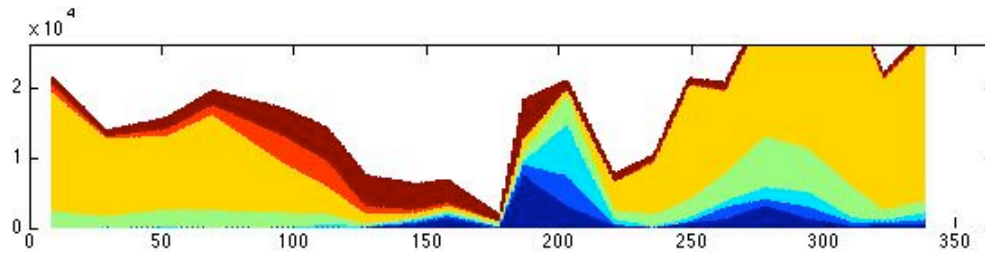


Model Assumptions

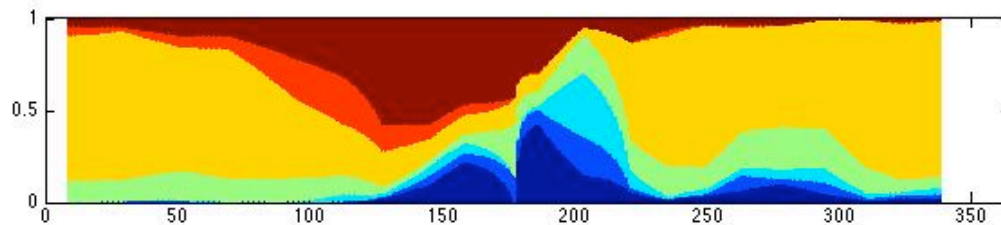
- Eggs produced in surface
- Non-DVM stages are “retained” in mixed layer
- 12:12 depth/surface timing for DVM
 - Feeding level “memory” for while at depth
- Growth rate is Type II versus food ($G_{\max} f(T)$)
- Development rate decreases at very low food
- Instantaneous mortality rate $f(T)$
- Dormancy:
 - Triggered during C4 IF lipids $>$ threshold (% dry wt)
 - Exit triggered when lipids $<$ threshold (% dry wt)
 - Lipid use from Saumweber

AG station model results

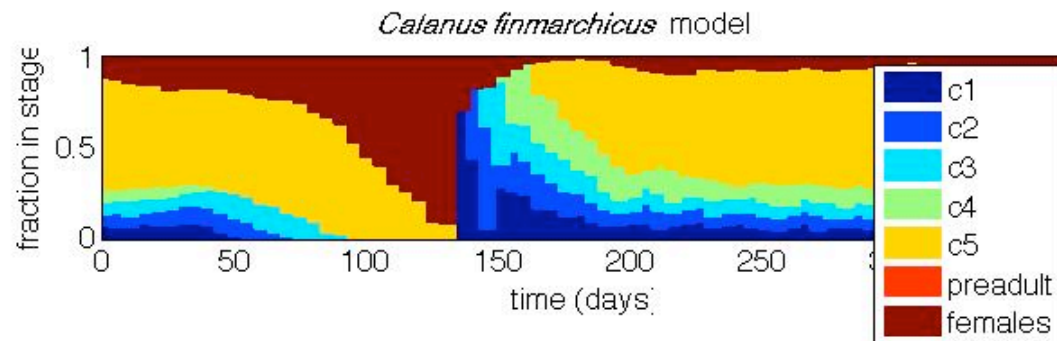
Obs abundance



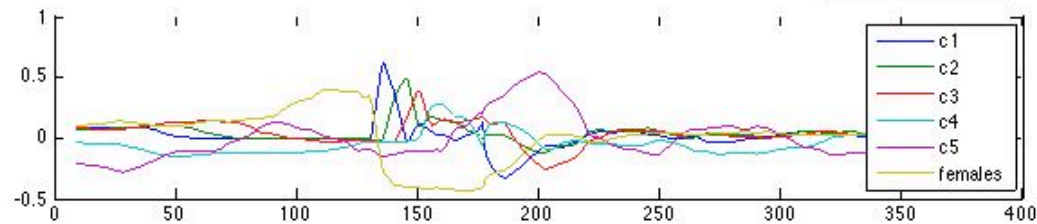
Obs freq



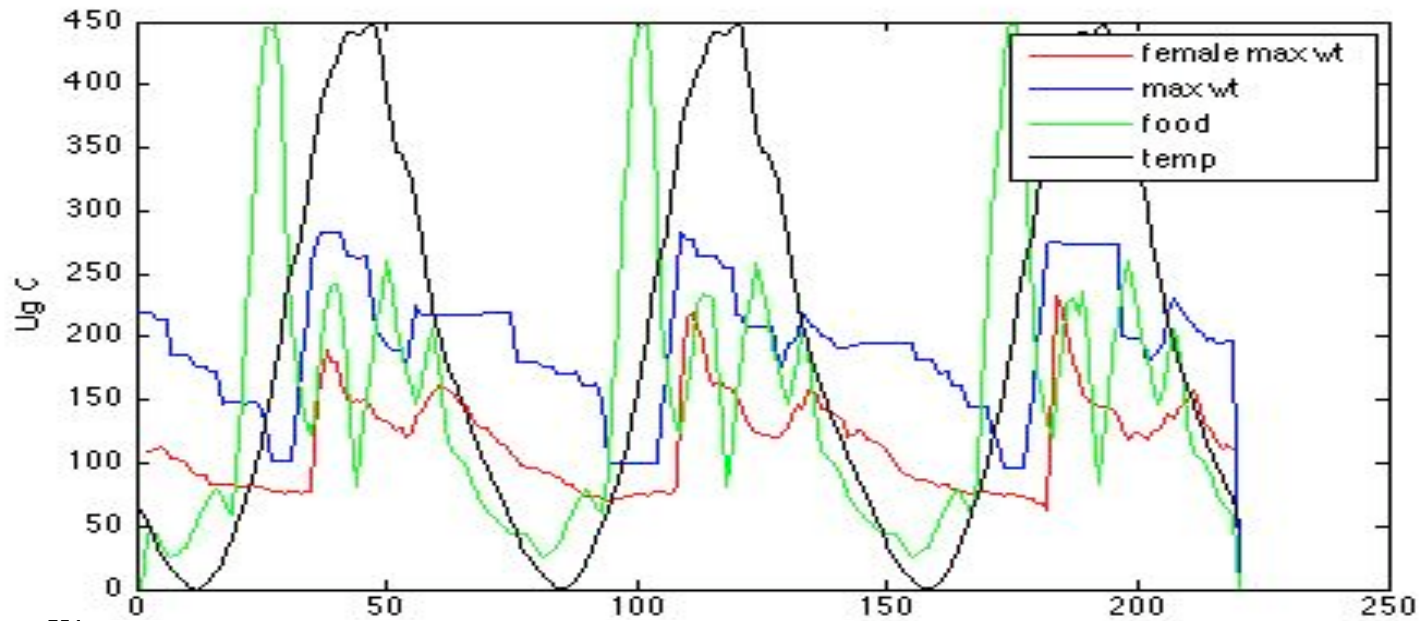
Model freq



Model - obs

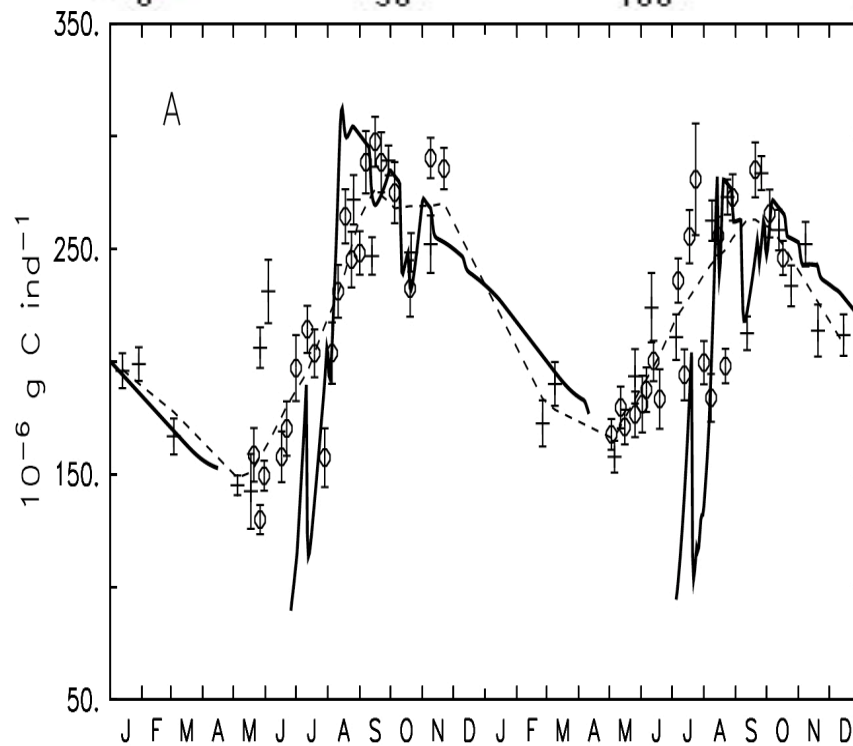


Model copepod sizes



C5's

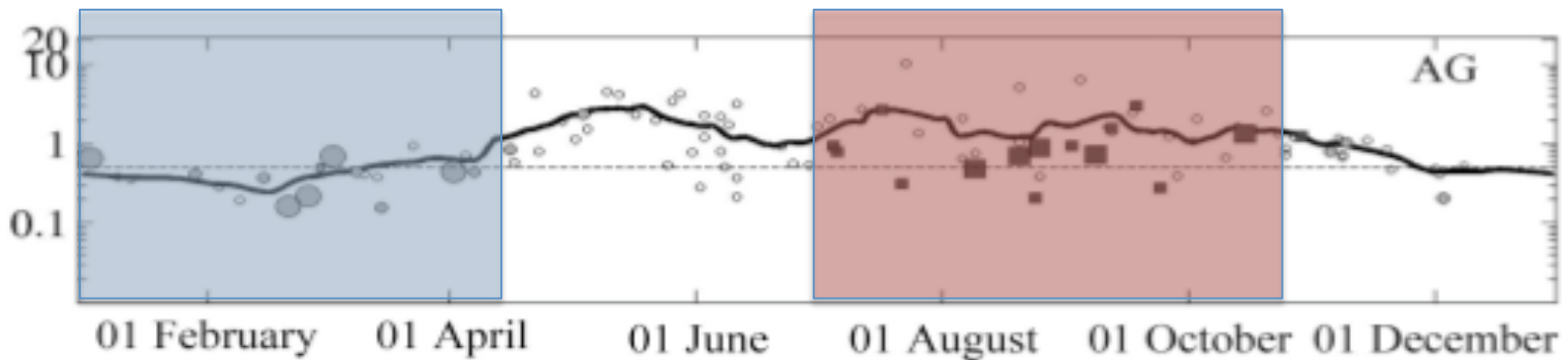
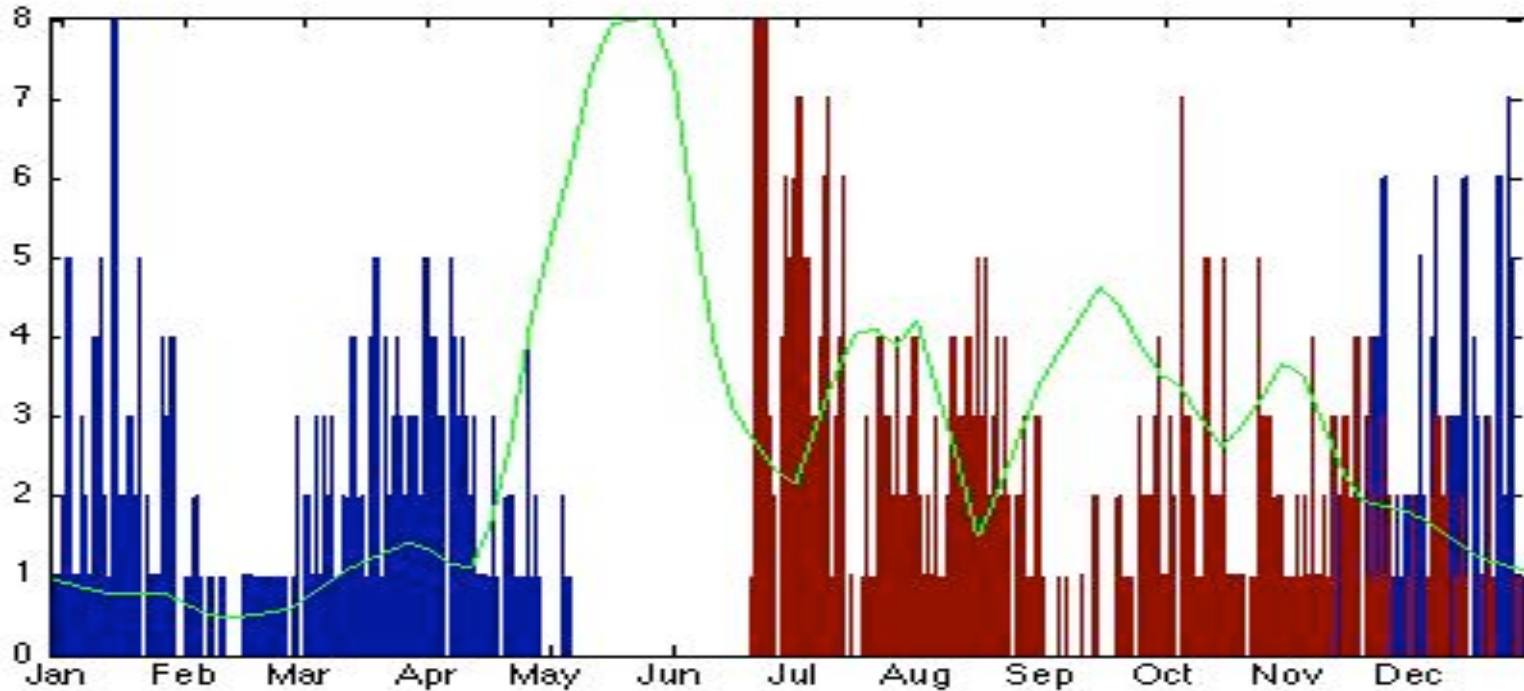
Female



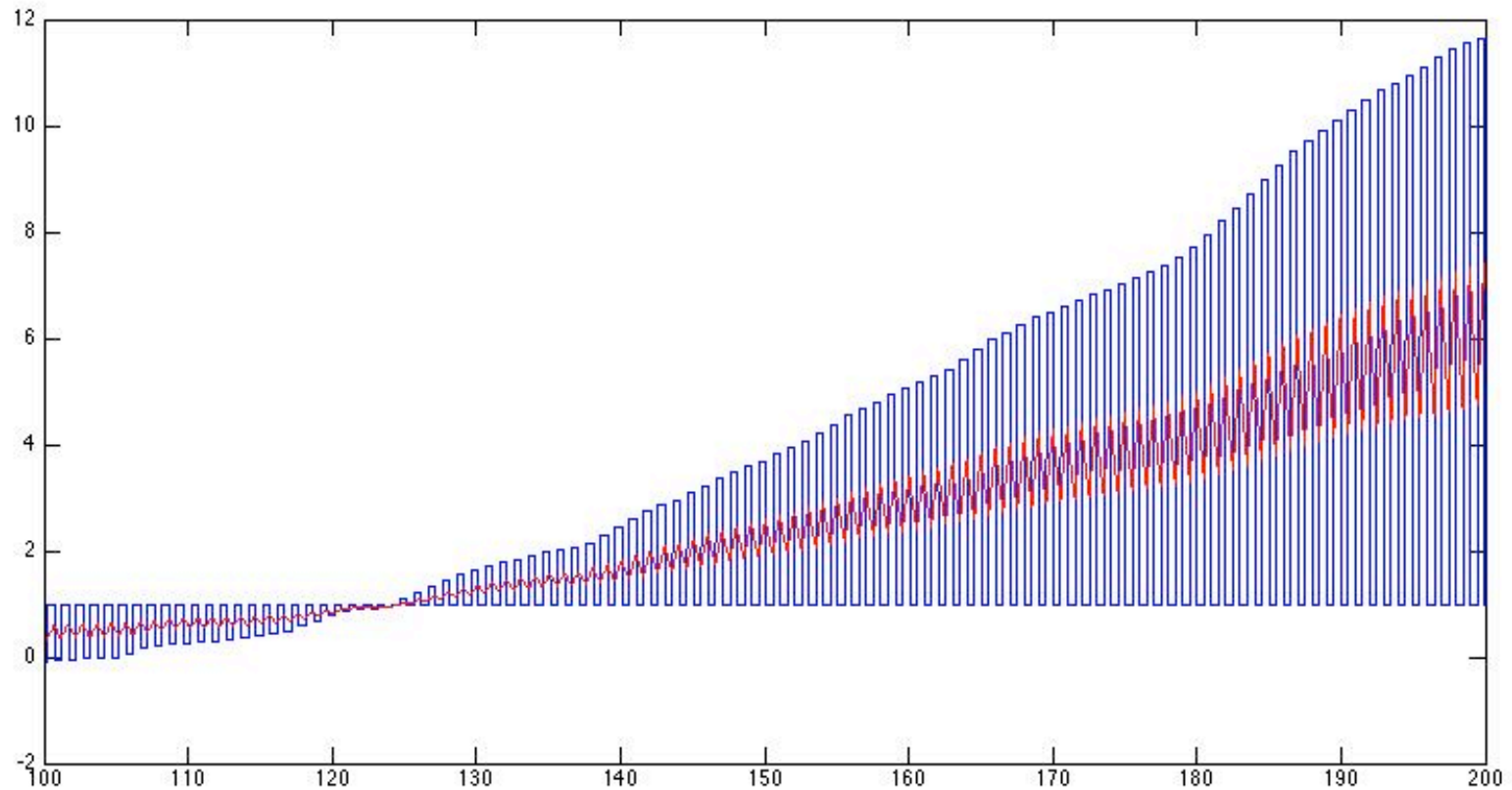
Max C5 ~ 275 ug C, ~DOY 200

Min C5 ~ 100 ug C, ~ DOY 140

Dormancy Timing



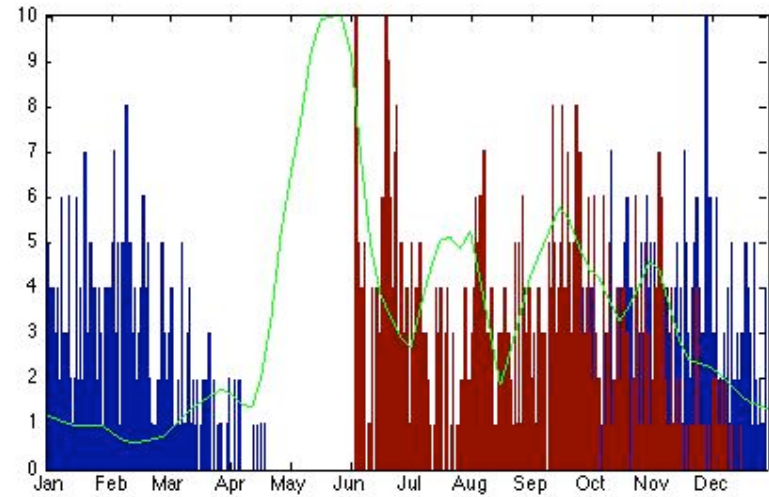
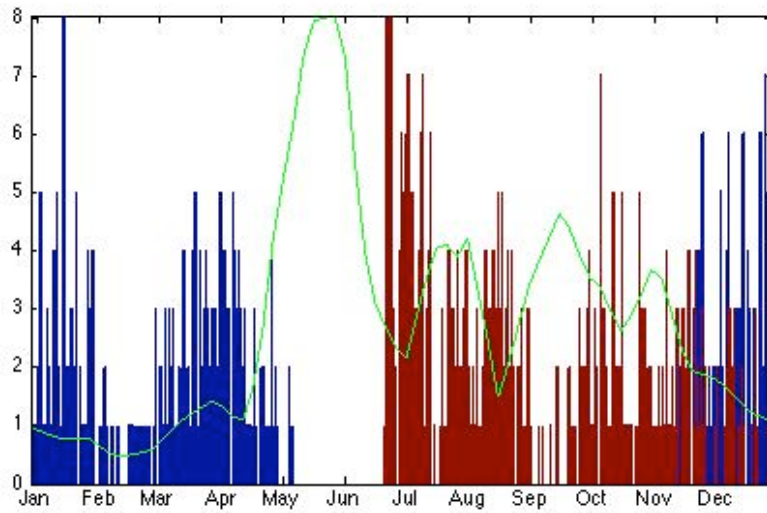
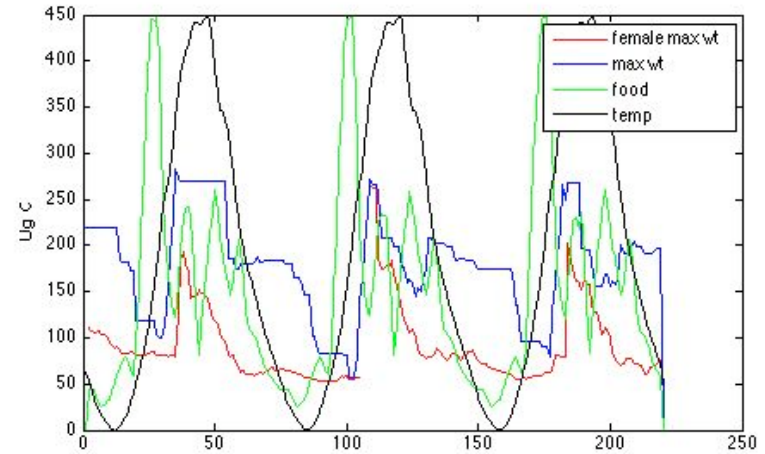
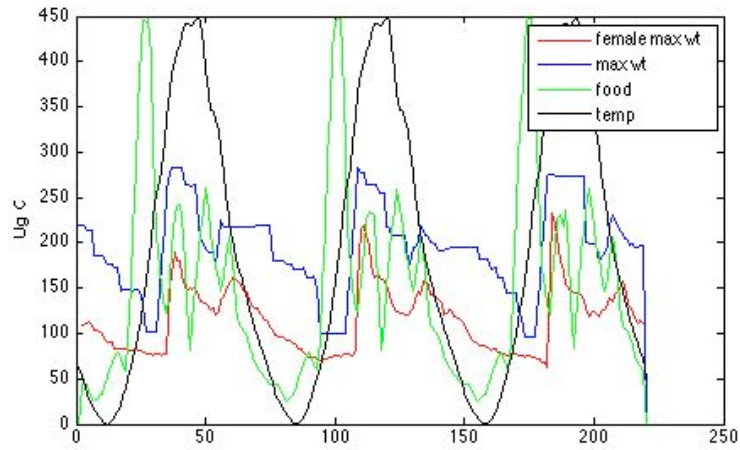
What about changing Temperature?



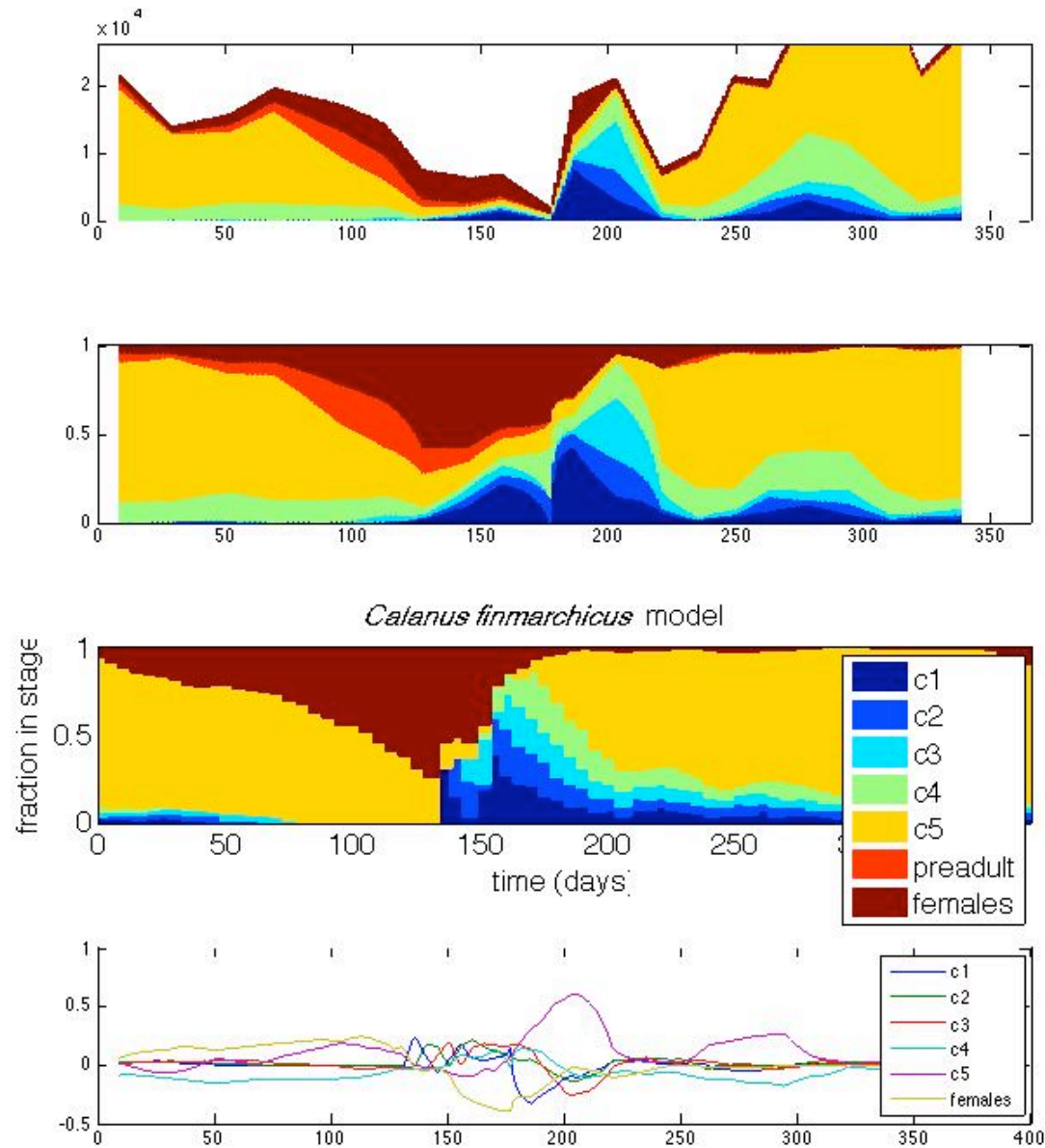
24 hour “temperature Memory” - running weighted mean

Comparing w + w/o TMF

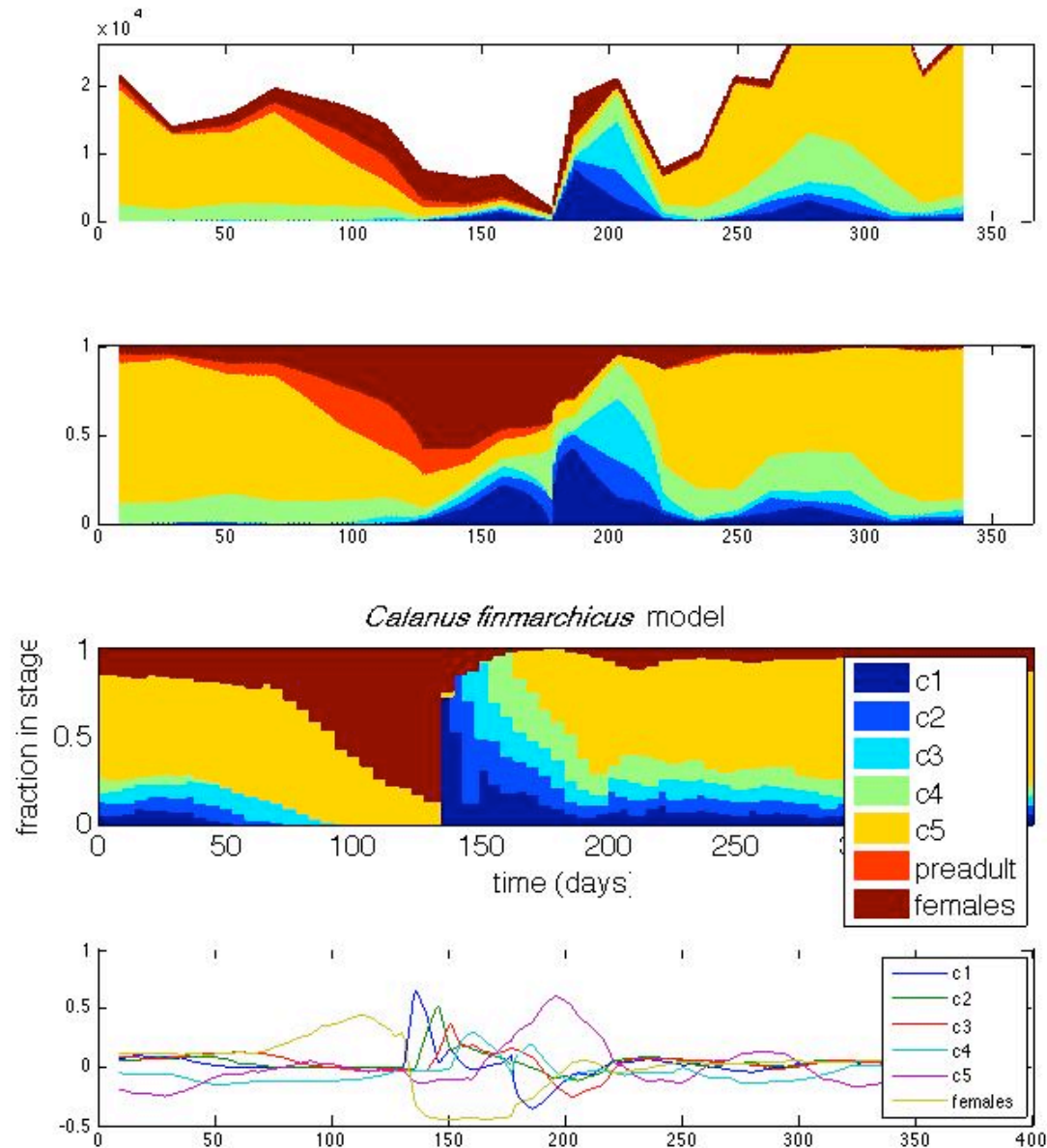
TMF



Using Development Trigger

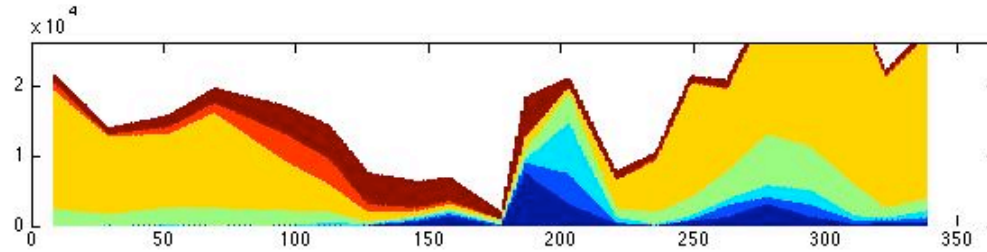


Using Development + lipid Trigger

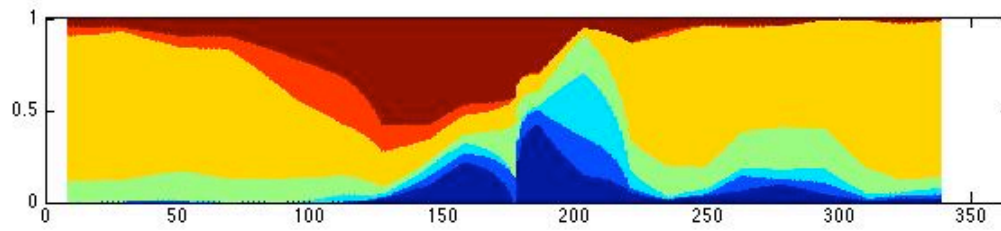


Just lipids again

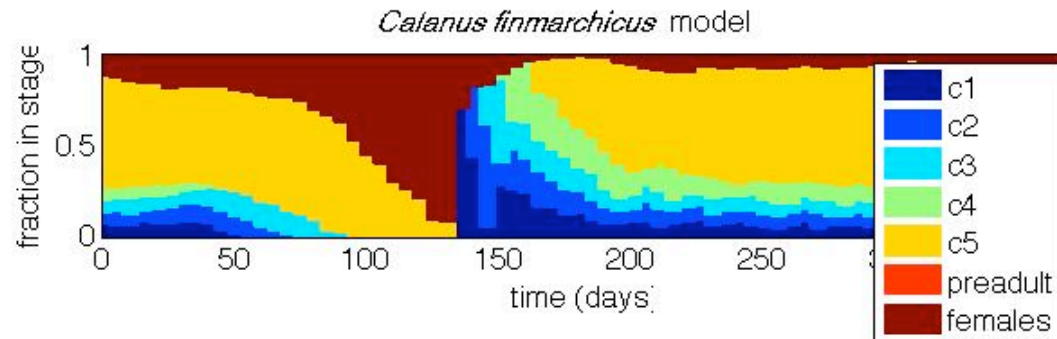
Obs abundance



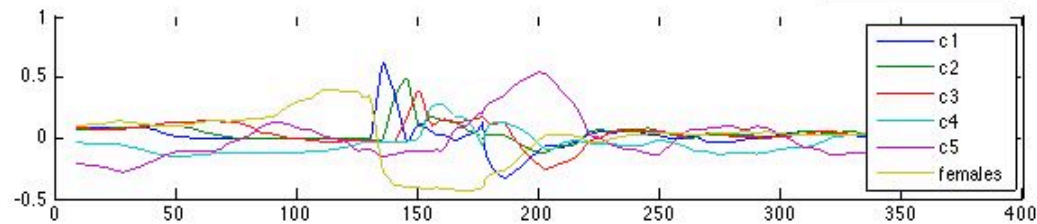
Obs freq



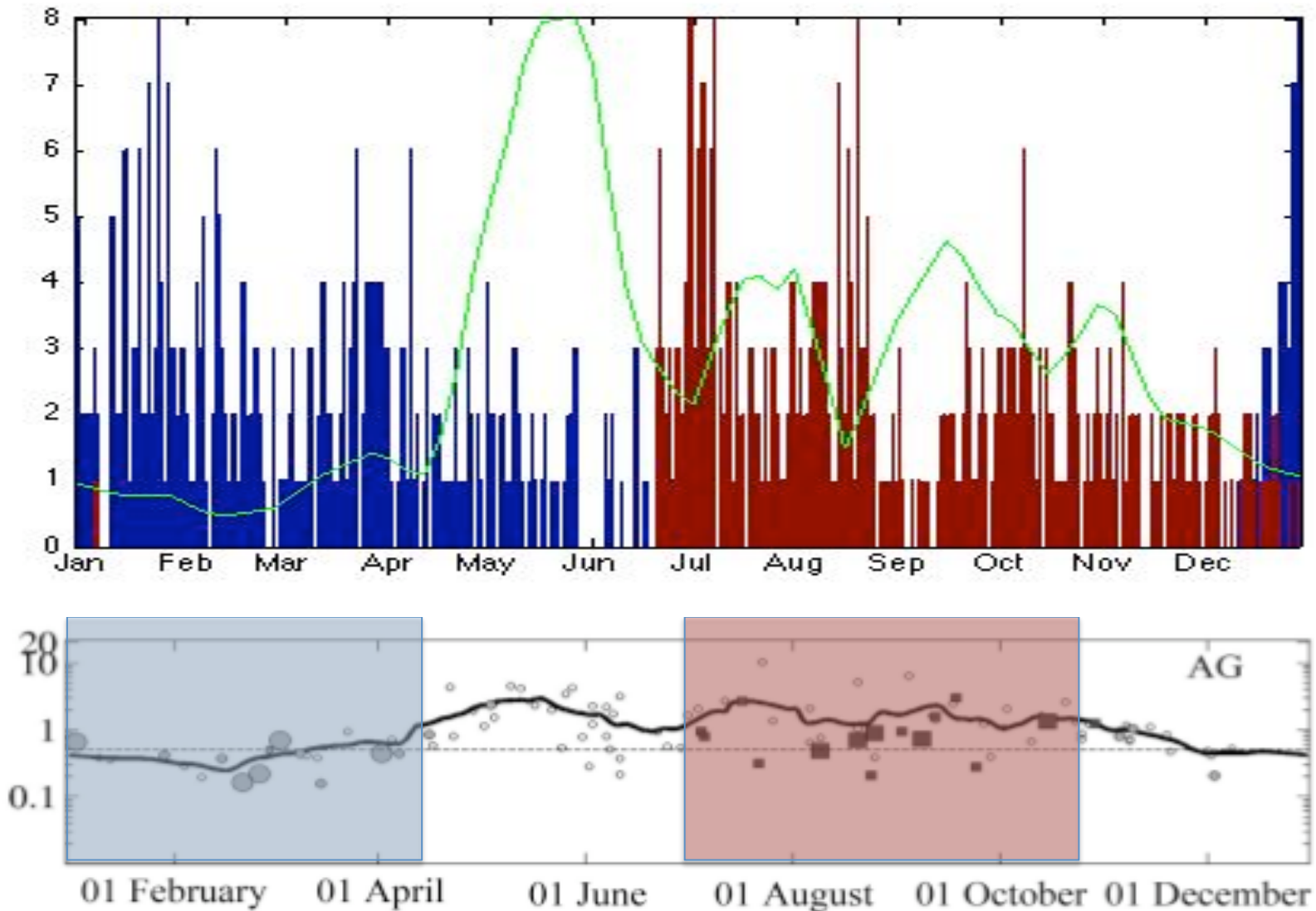
Model freq



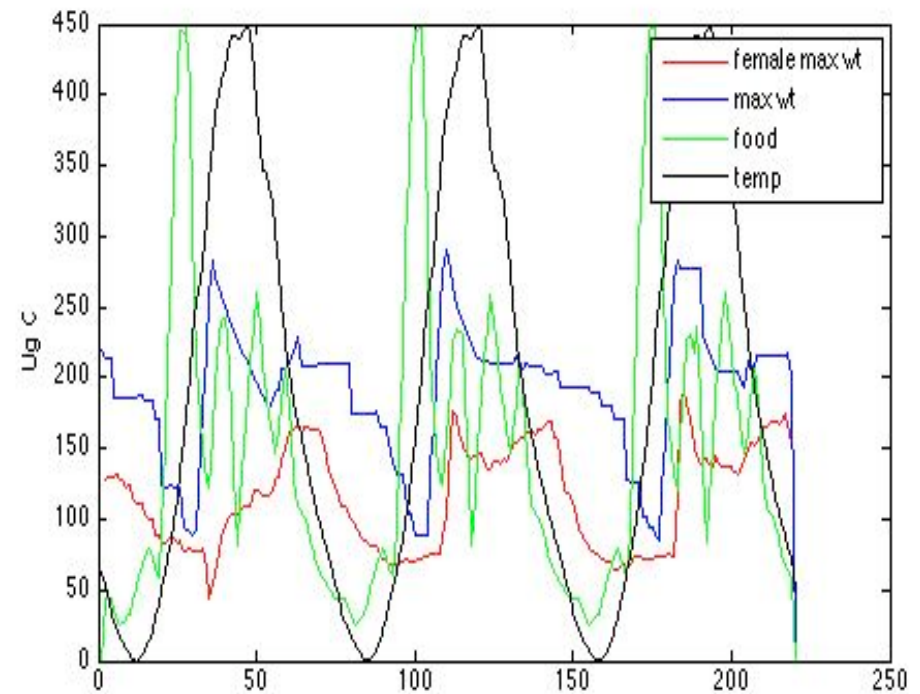
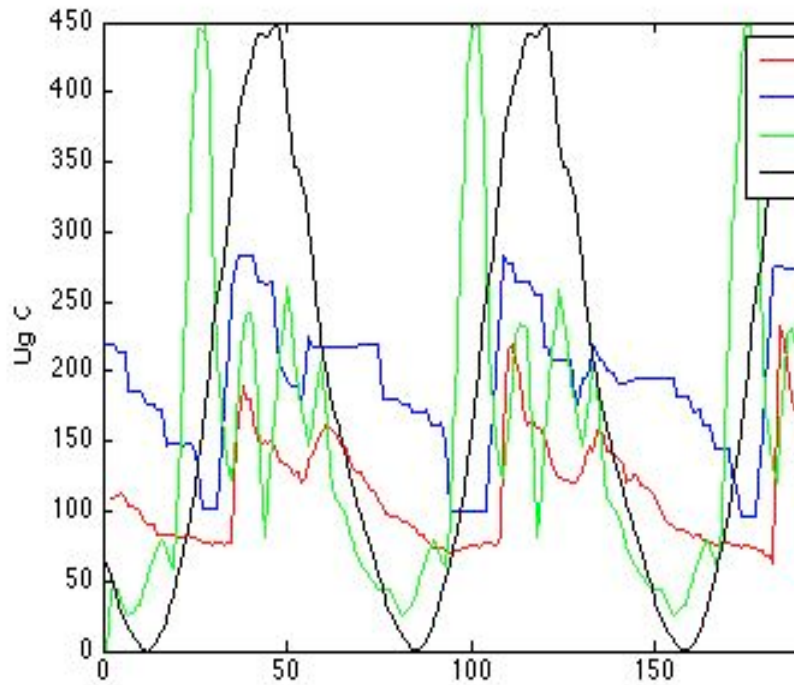
Model - obs



Dormancy Timing, dev trigger only



Model copepod sizes

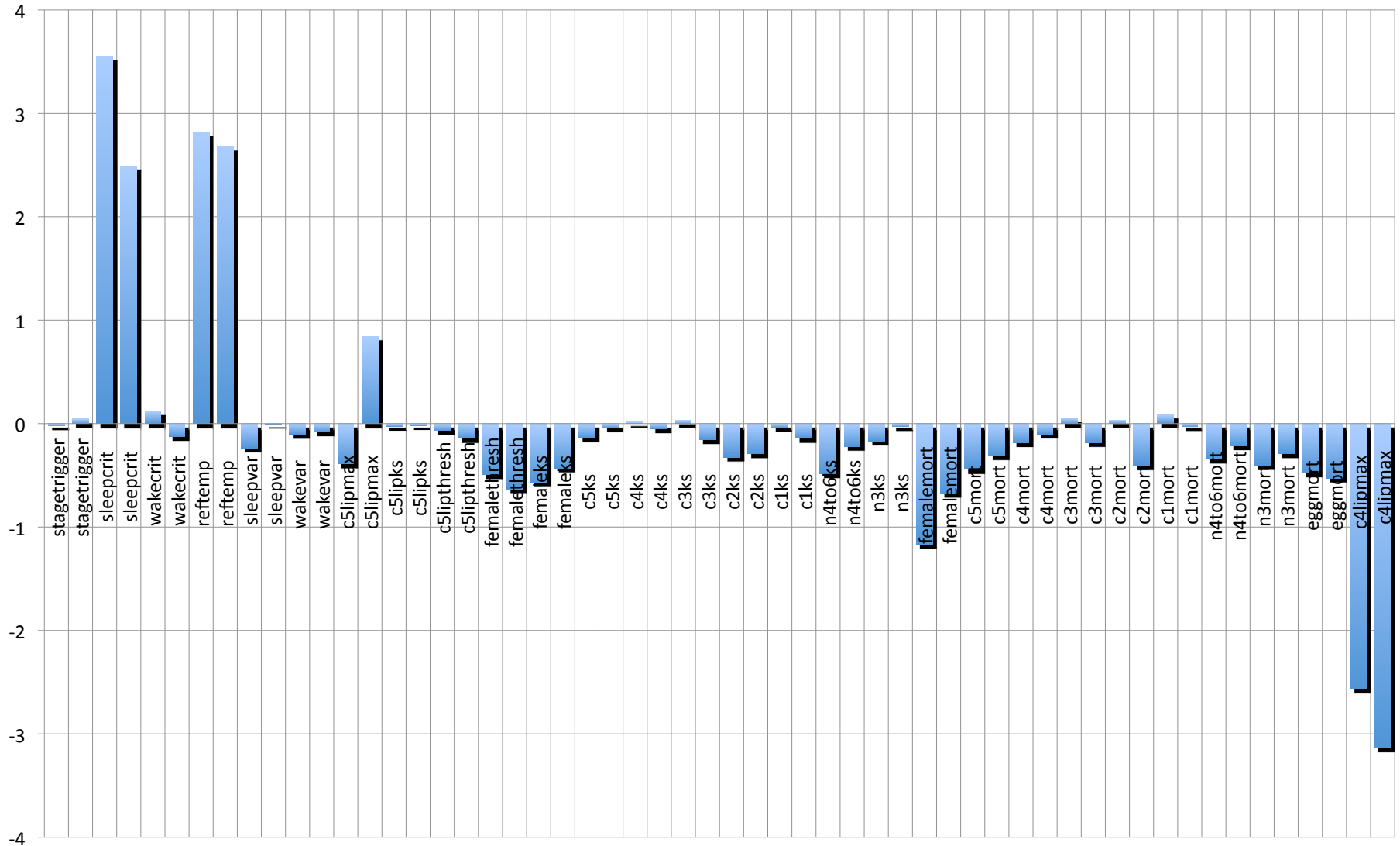


Max C5 ~ 275 ug C, ~DOY 200

Min C5 ~ 100 ug C, ~ DOY 140

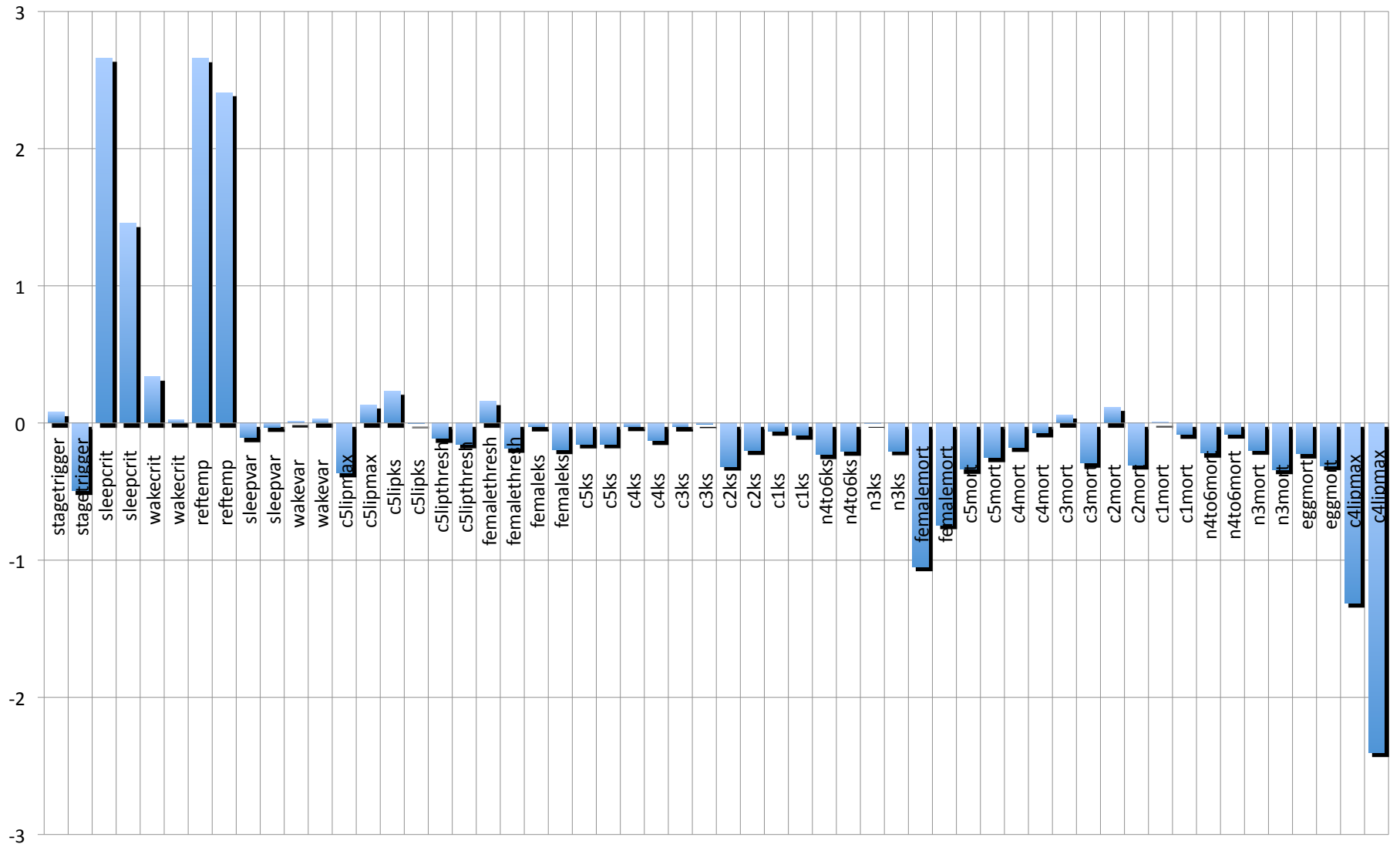
Model Parameter Sensitivity

AG egg production



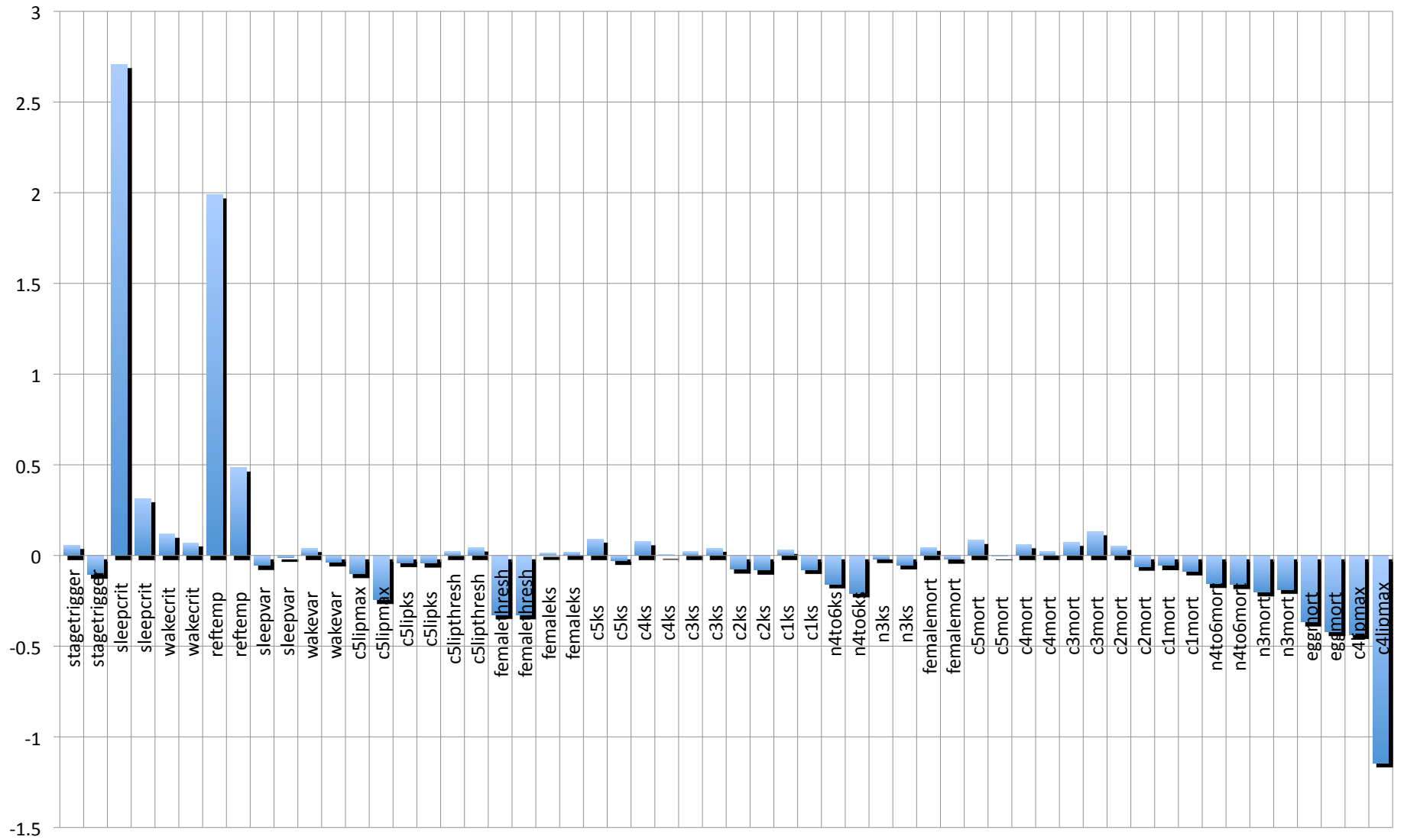
Model Parameter Sensitivity

AG adult biomass



Model Parameter Sensitivity

AG nauplii biomass



Model Parameter Sensitivity

AG number dormant

