

Basin-scale/inter-regional study of copepod population dynamics

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Potential target species:

- *Centropages typicus* (& *C. hamatus*)
- *Pseudocalanus* spp. (multiple spp. in N. Atlantic)
- *Calanus finmarchicus* (& *C. helgolandicus*)

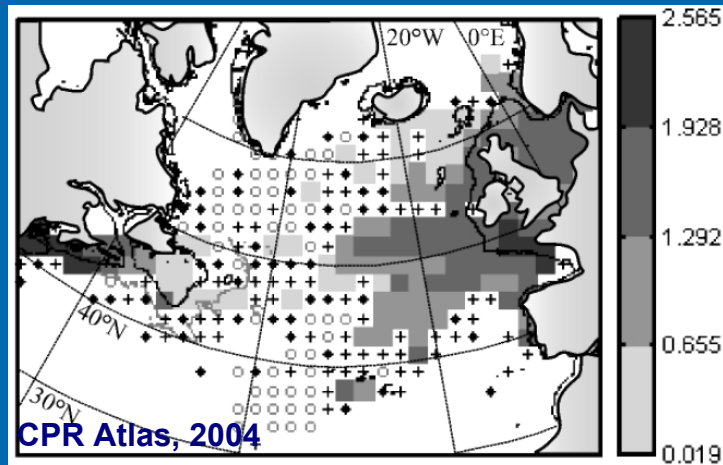
Questions:

- Inter-regional similarity/difference
- Spatio-temporal variability (Phenological and biogeographic shift)
- Drivers for the variability, projection

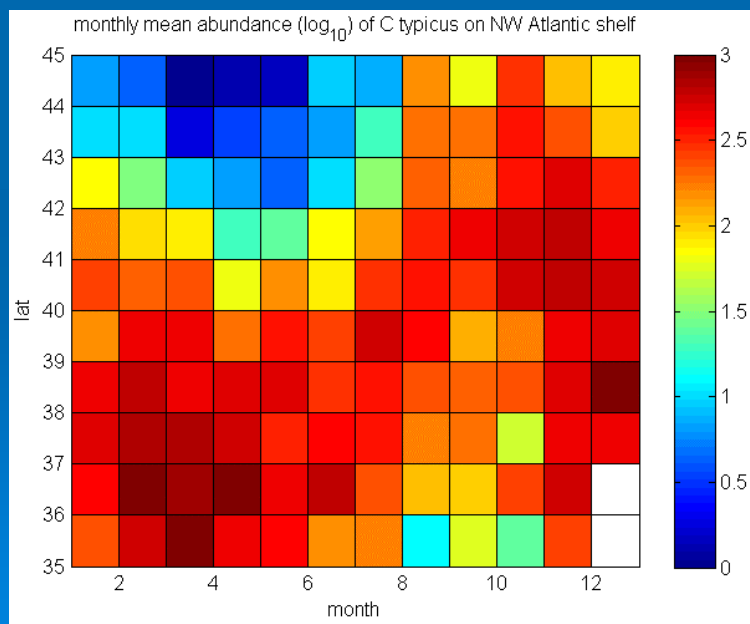
Approaches:

- Data analysis to identify pattern, variability and build conceptual model
- Numerical modeling for mechanistic understanding, projection and OSSEs

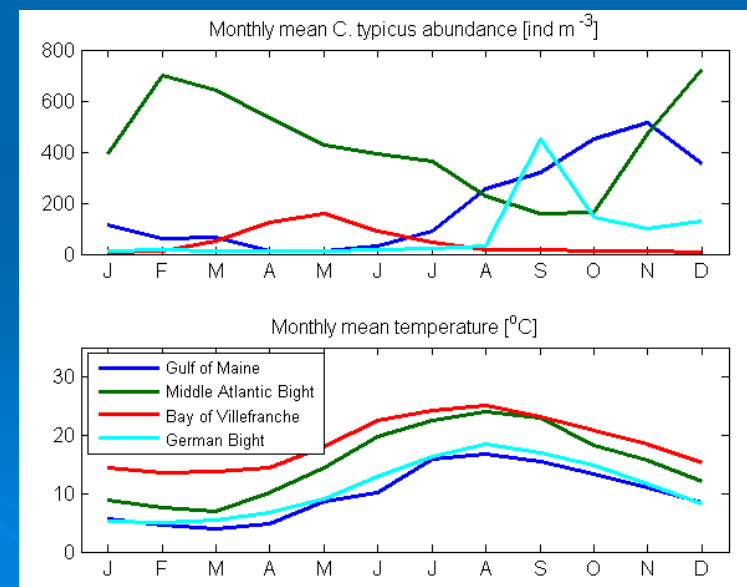
Centropages typicus: an example



- Biogeographic range
- Latitudinal shift in seasonality
- Difference/similarity across the basin
- Life history traits + climate drivers

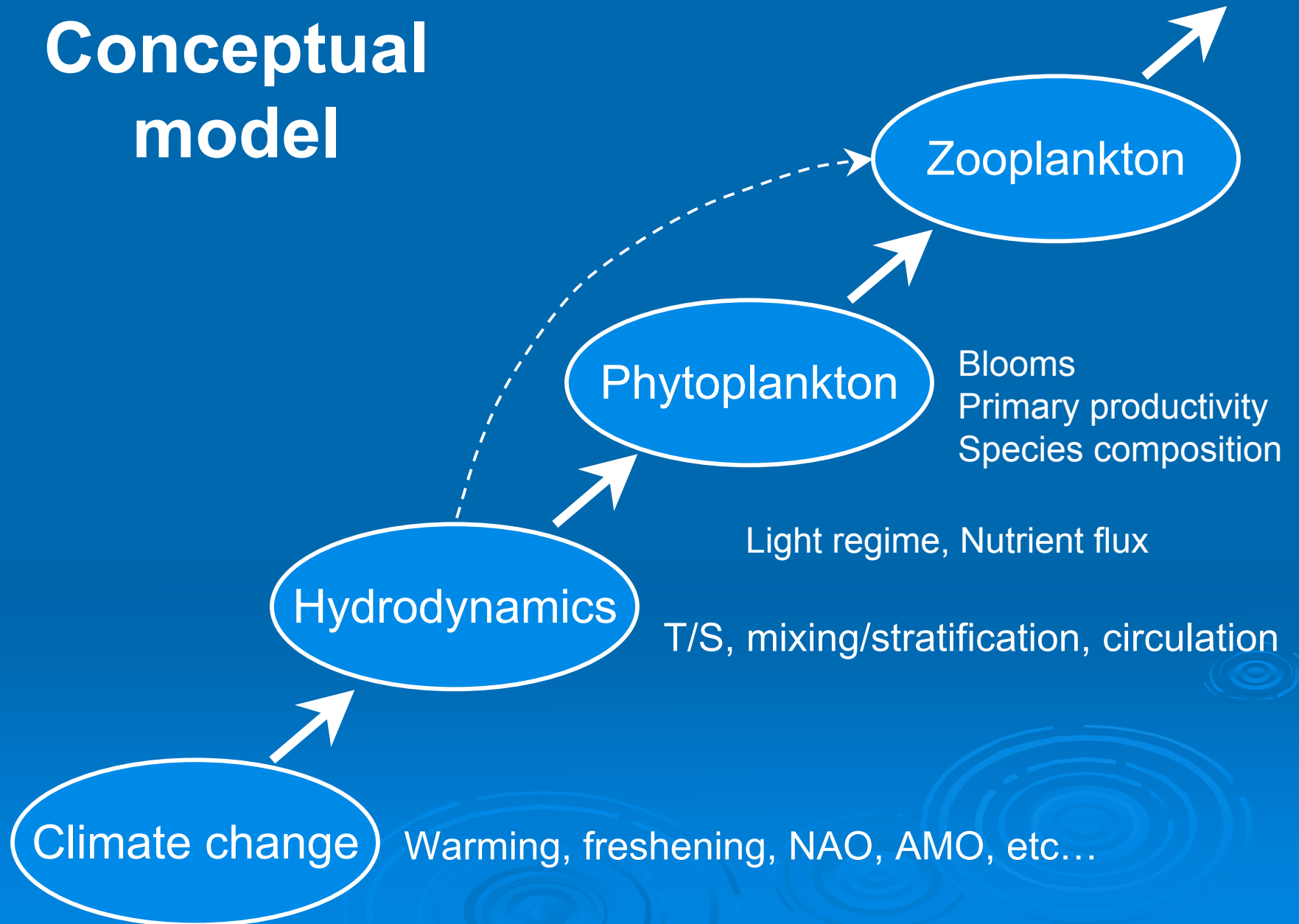


Latitudinal change of *C. typicus* abundance on the US Continental shelf



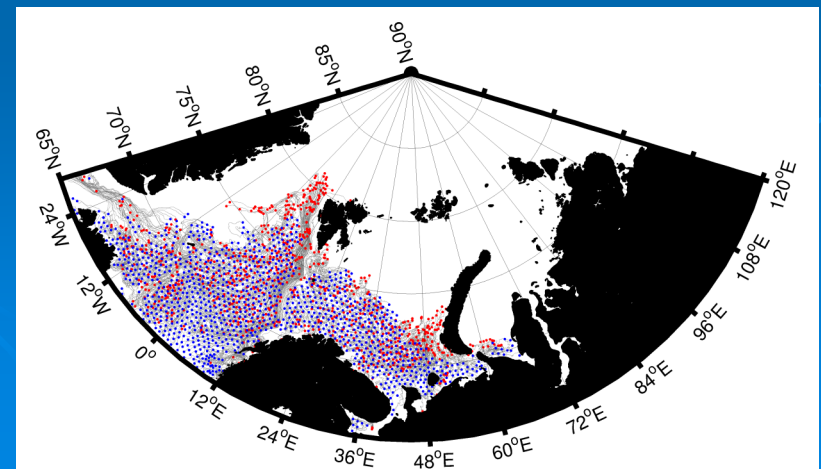
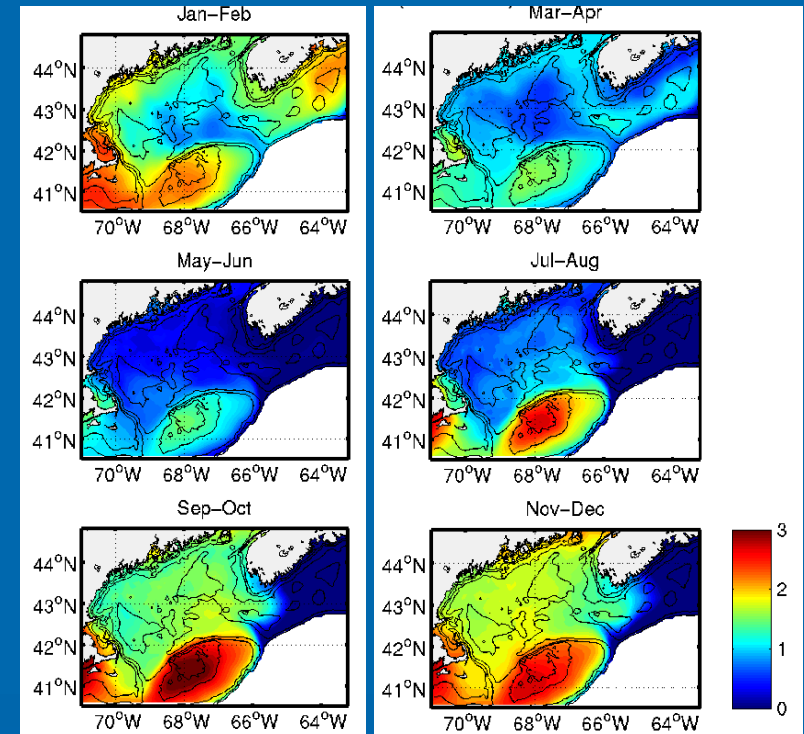
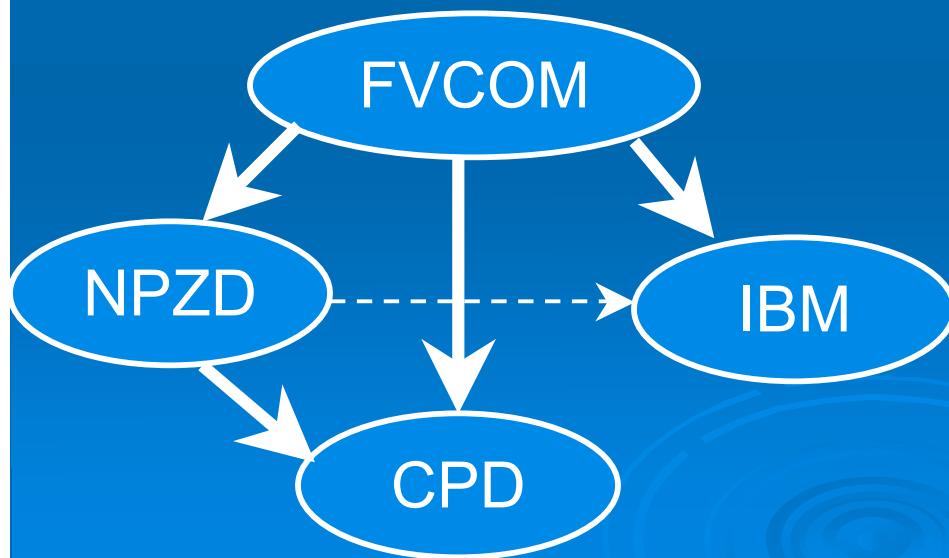
Seasonal *C. typicus* abundance and temperature from different locations.

Conceptual model



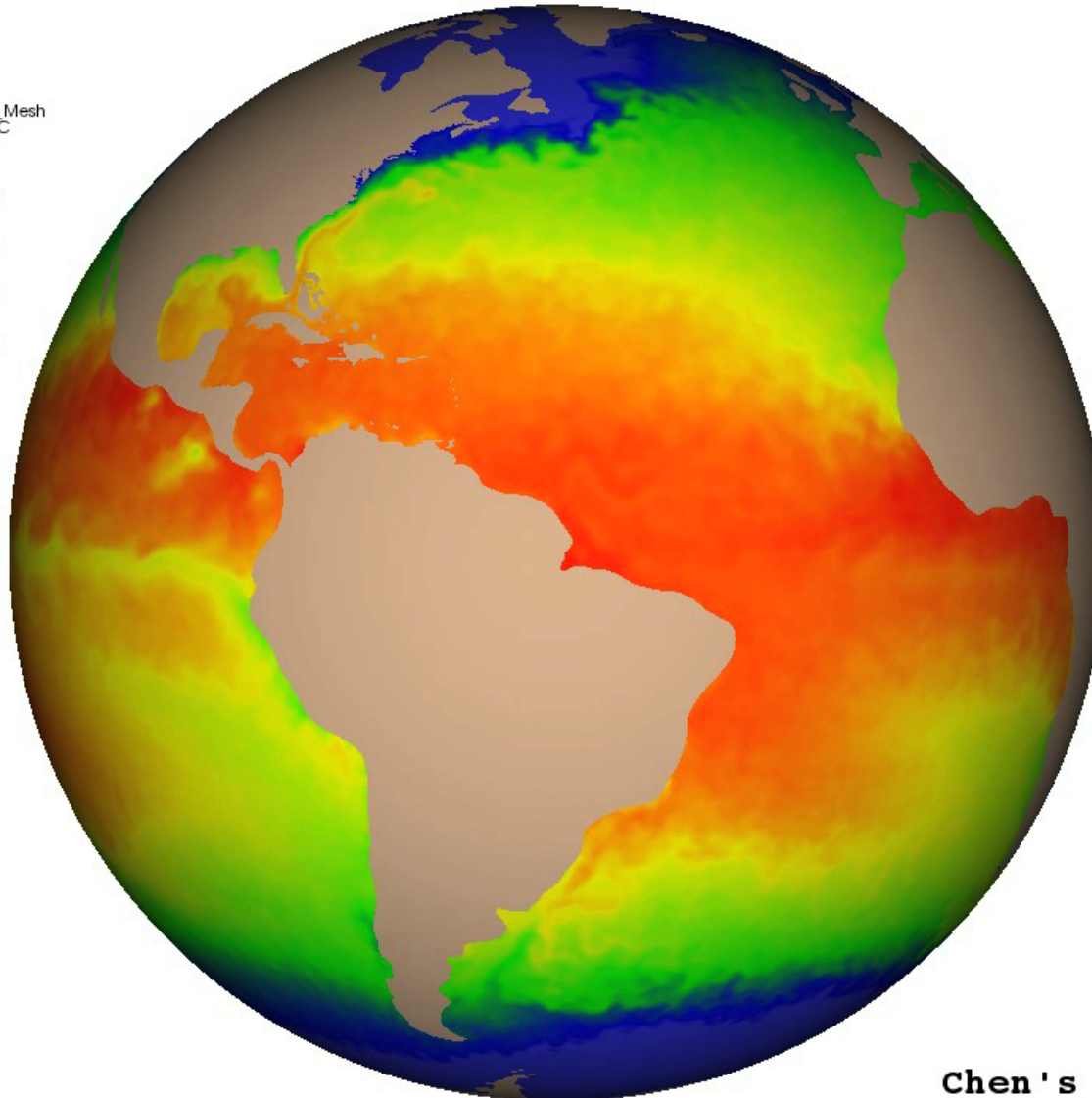
Numerical model

- FVCOM-based 3D model system
- Food web model - NPZD (Ji et al., 2008, JMS; 2009, JPR)
- Mean-age copepod model (Hu et al., 2007, MEPS; Ji et al., 2009, MEPS)
- Individual Based Model (Ji et al., in prep)



GLOBAL FVCOM for BASIN Studies

Pseudocolor
Var: temp/SSH_Mesh
Units: degrees_C
30.00
23.50
17.00
10.50
4.000
Max: 31.58
Min: -1.801



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