

2020-02-17, Ocean Sciences Meeting

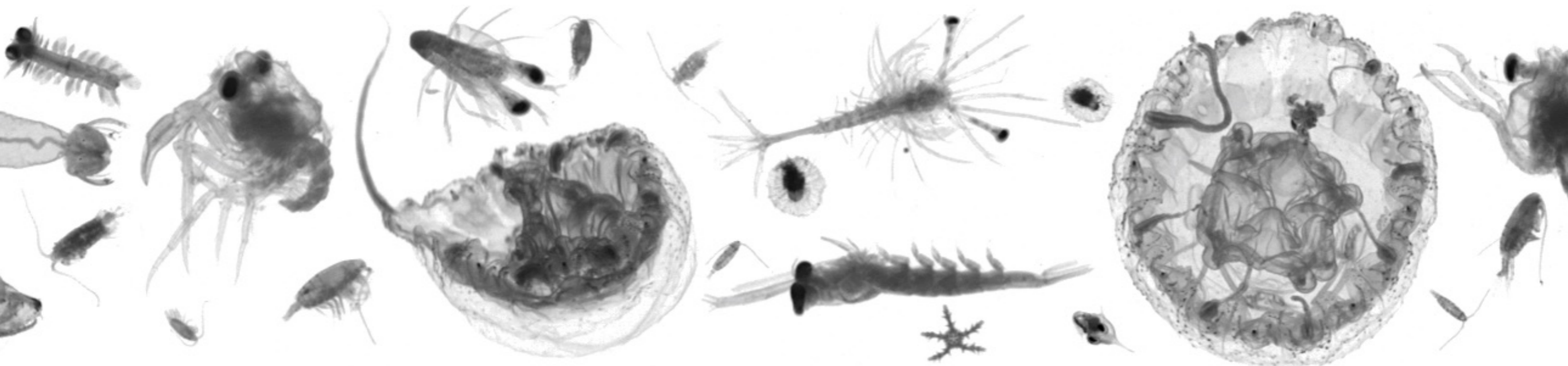
Irisson, Cailleton, Desnos, Jalabert, Elineau, Stemmann, Ayata

irisson@normalesup.org



Morphological diversity increases with oligotrophy along a zooplankton time series

Villefranche-sur-Mer, NW Mediterranean Sea



Plankton sampling in Villefranche-sur-mer

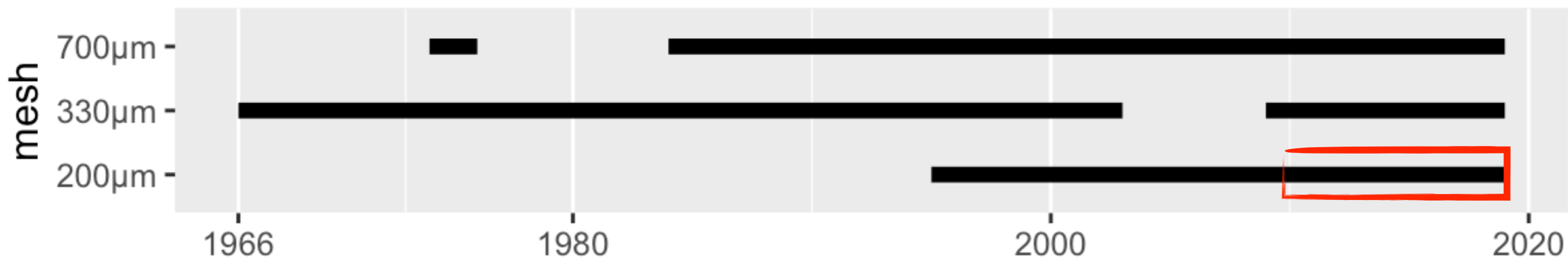
Historical site for plankton observation (dating back to Haeckel)

Two samples per day

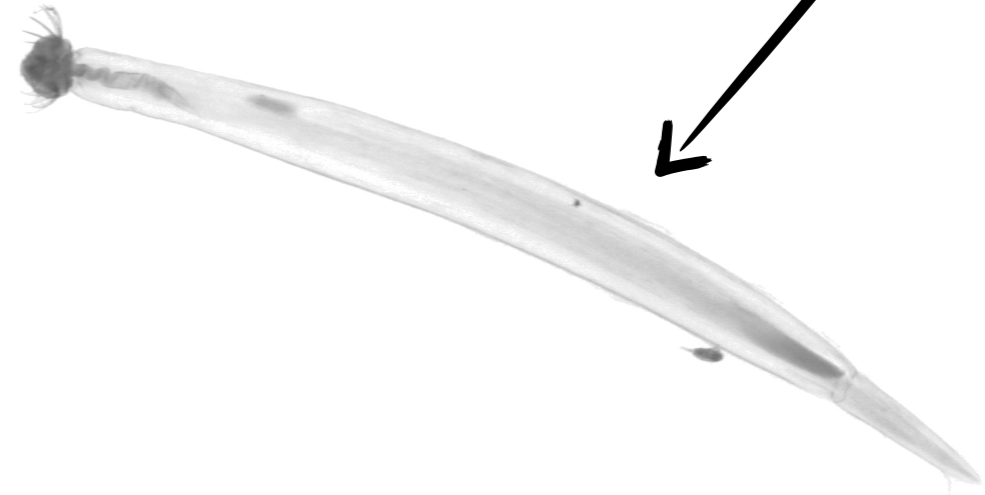
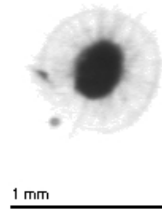
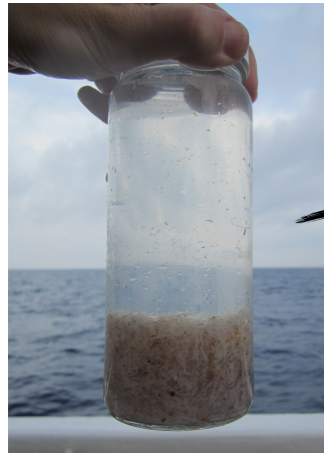
Pooled per **week** for analysis

Only **2009-2017** analysed here

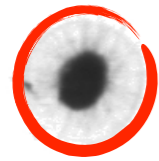
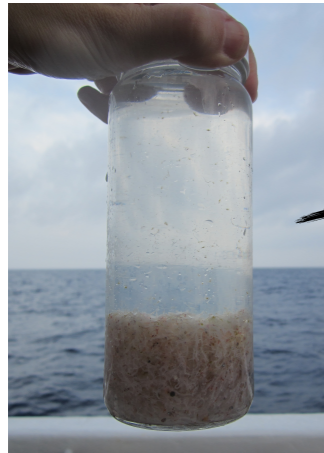
Come work with us!



Automatic extraction of morphological features



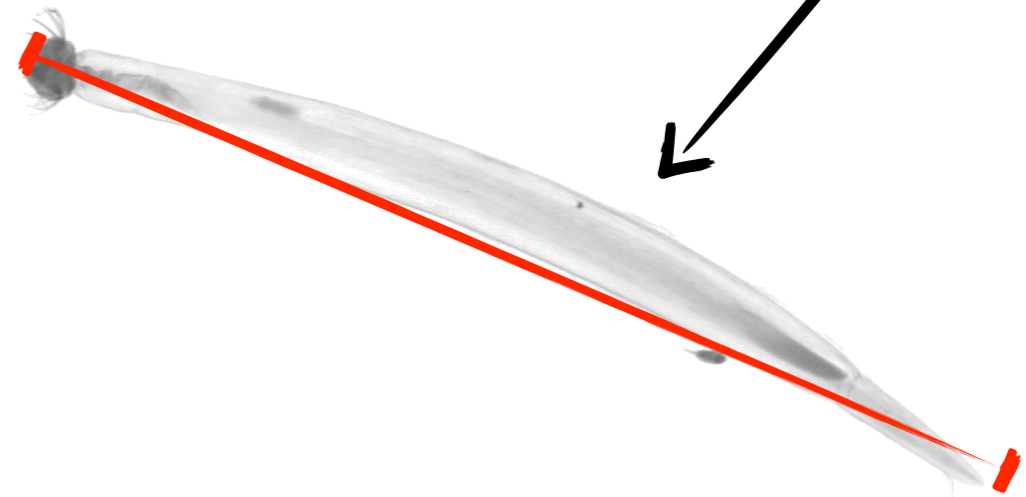
Automatic extraction of morphological features



1 mm

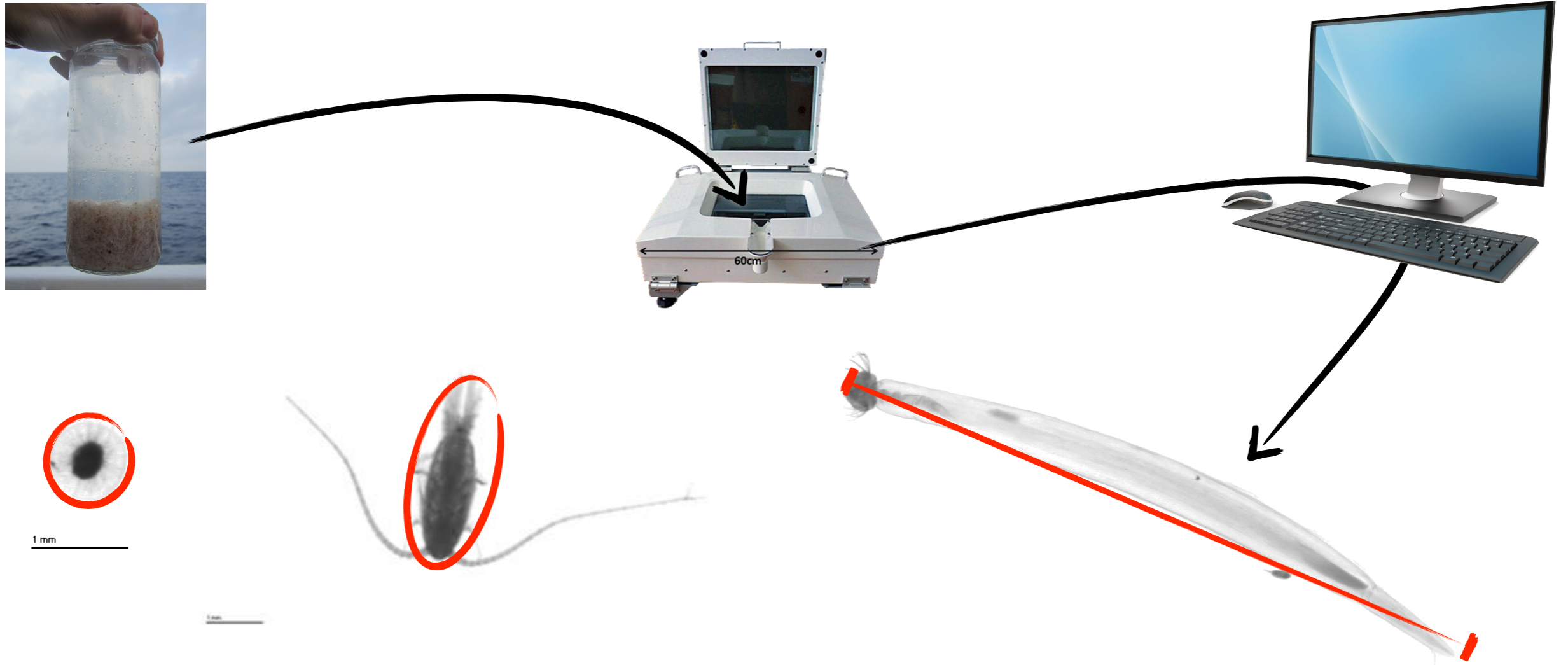


1 mm



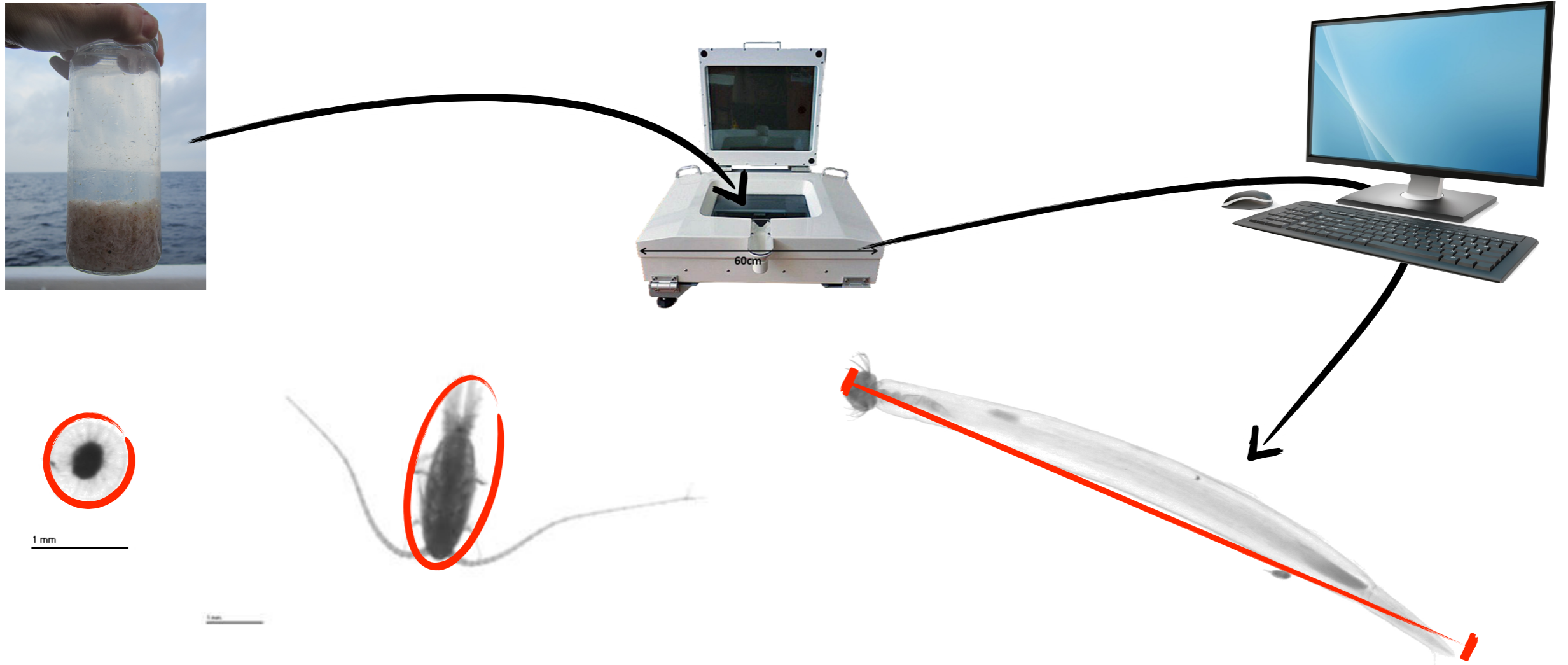
1 mm

Automatic extraction of morphological features



	feature 1	...	feature m
ind 1			
ind 2			
ind 3			
ind 4			

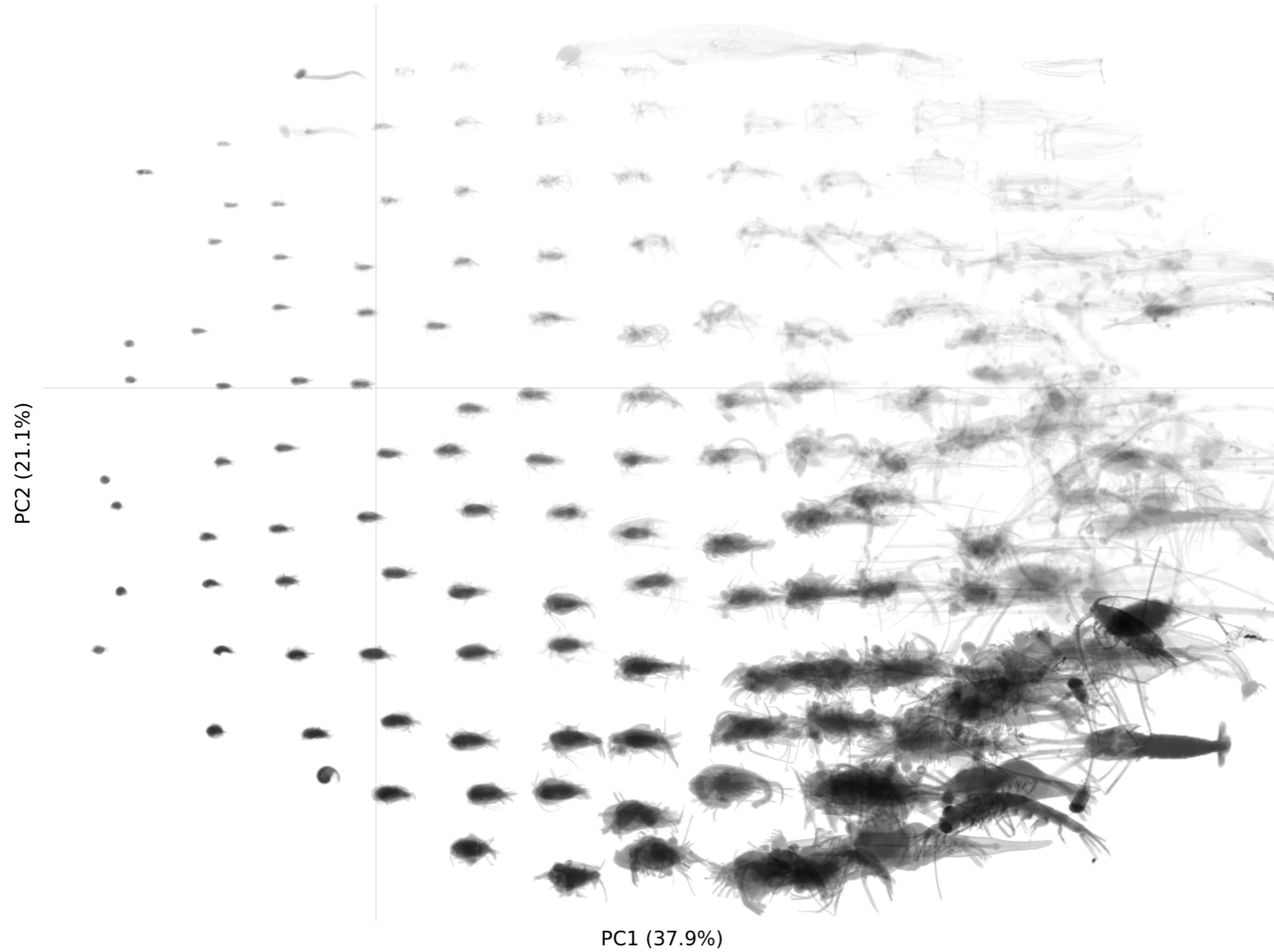
Automatic extraction of morphological features



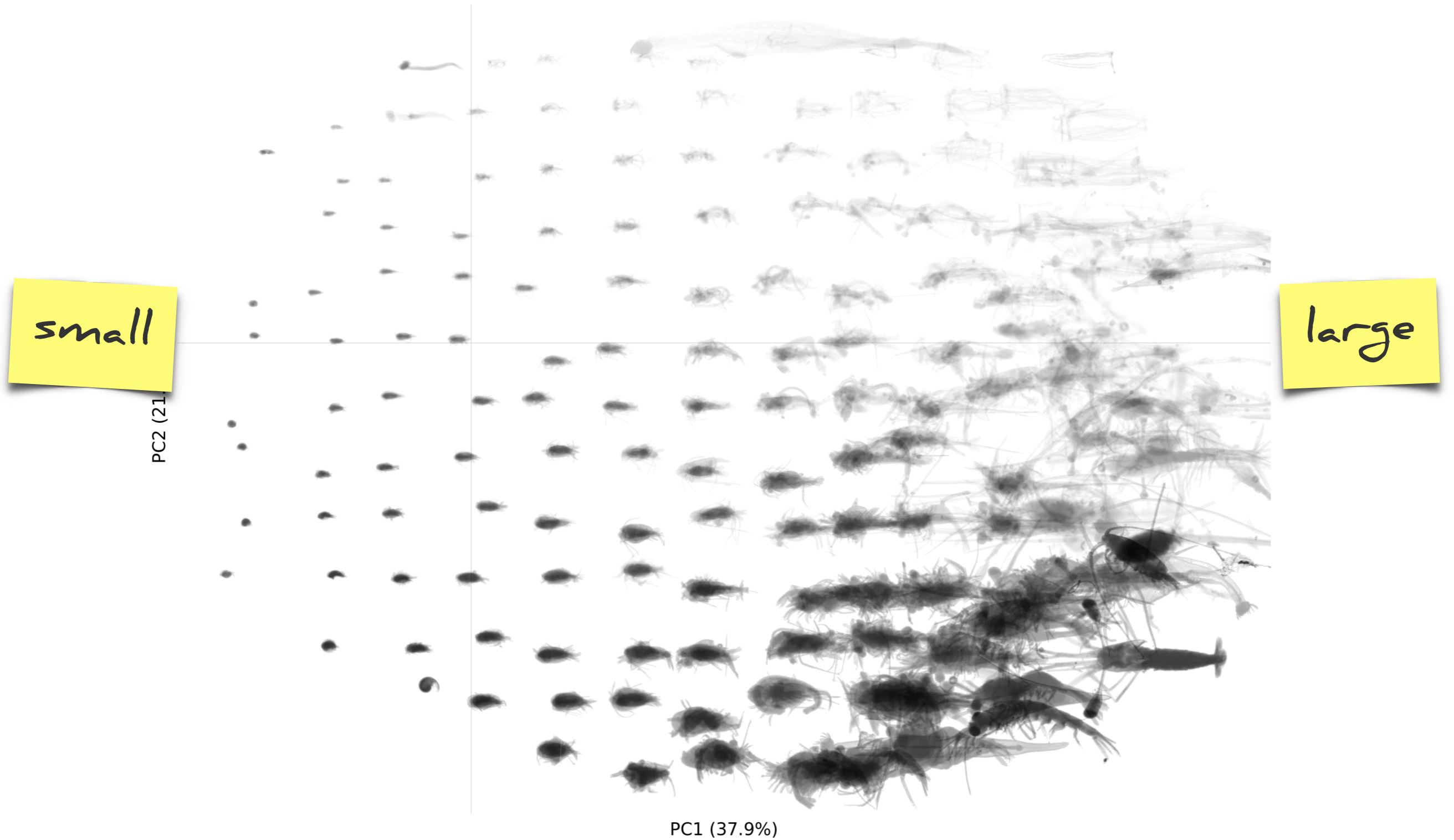
	feature 1	...	feature m
ind 1			
ind 2			
ind 3			
ind 4			

587,059 x 45

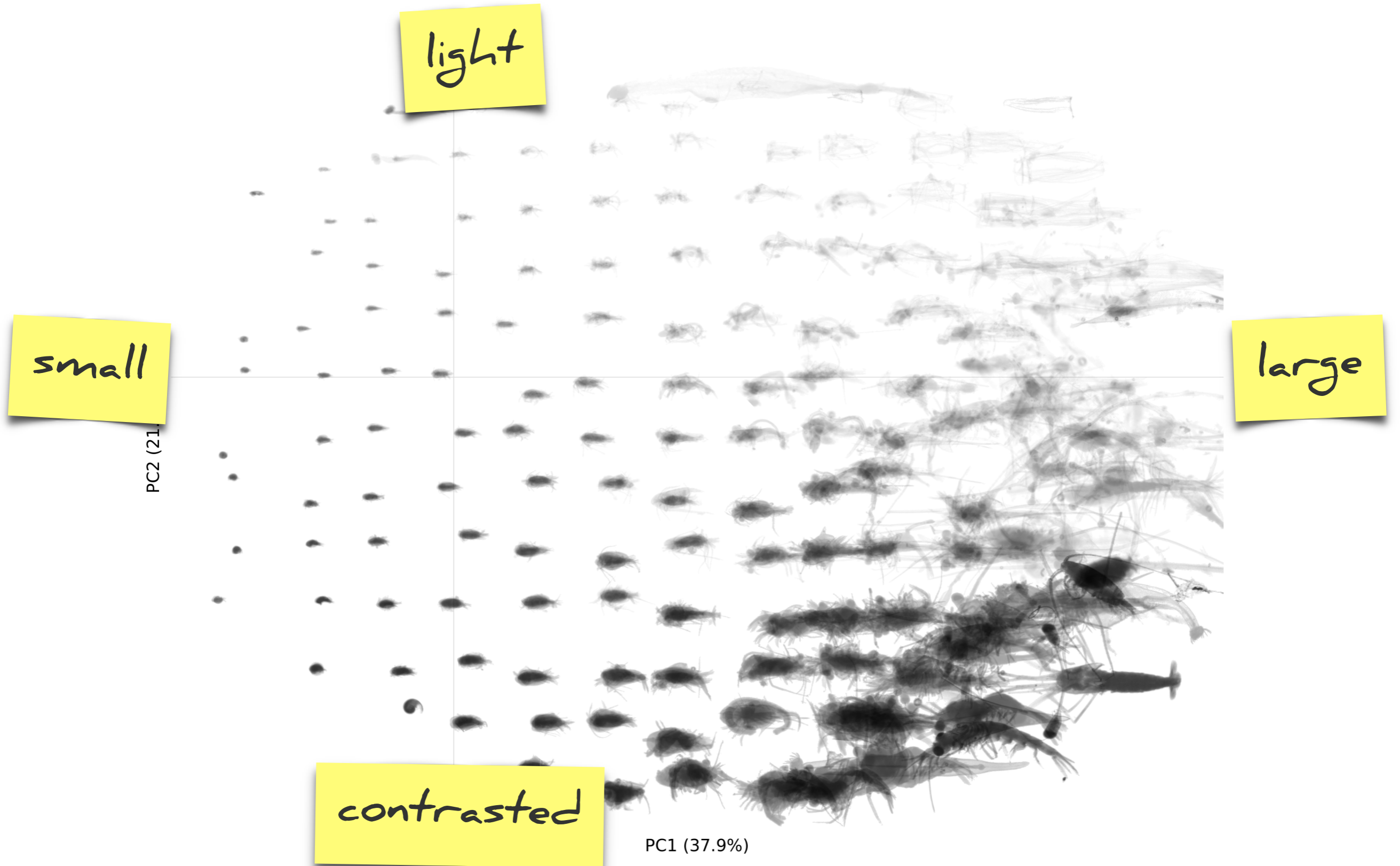
Plankton in morphological space



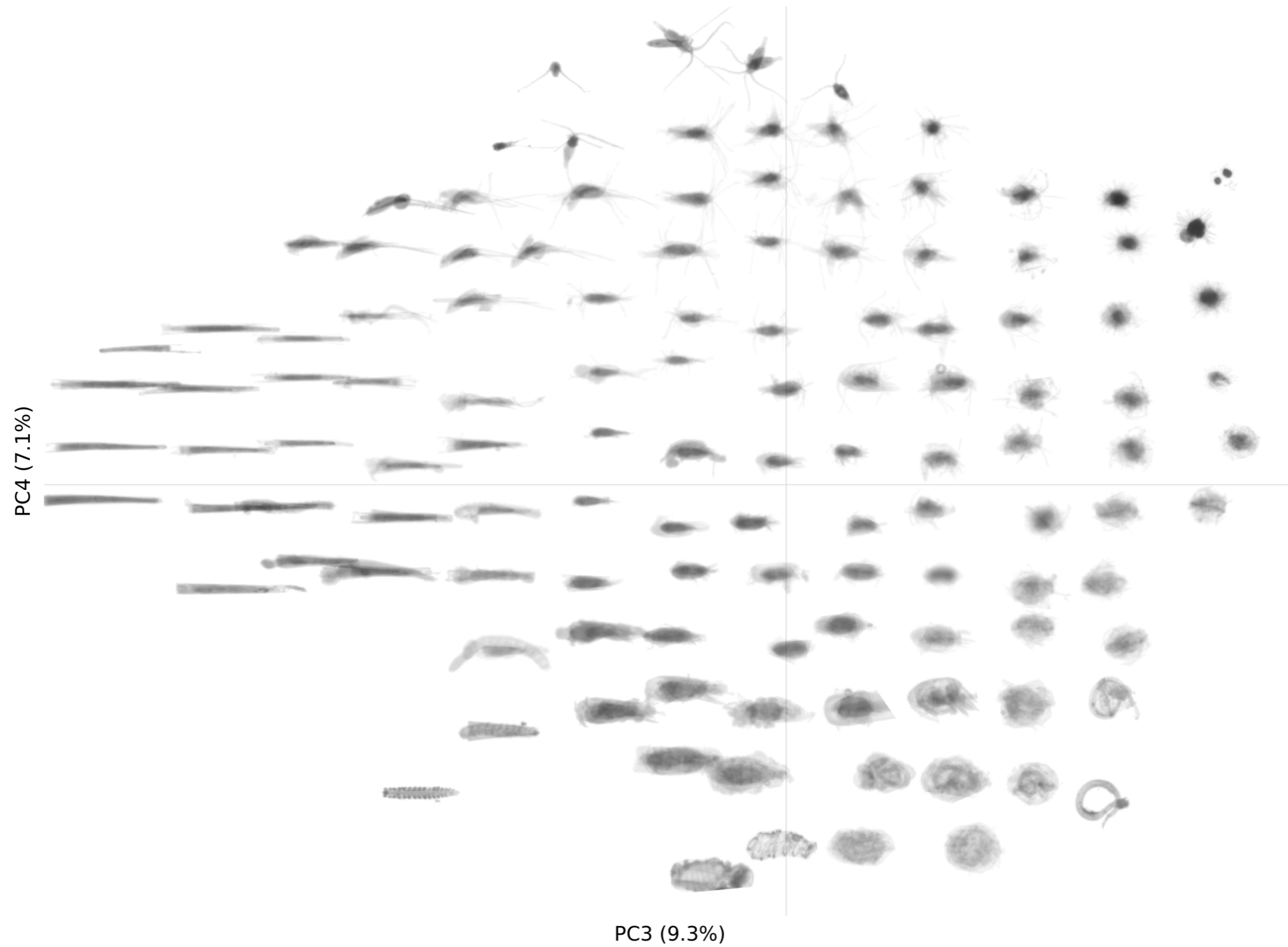
Plankton in morphological space



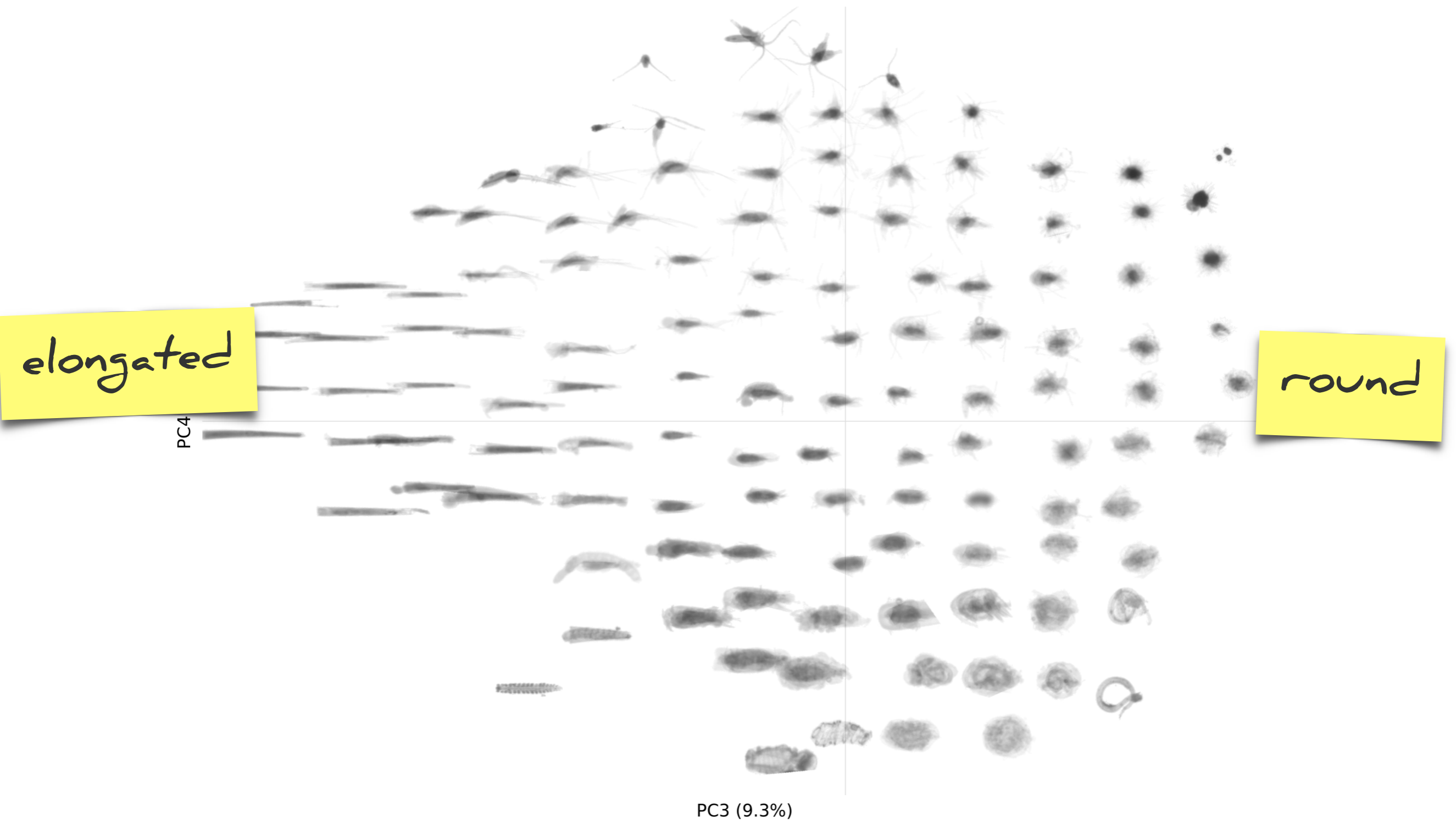
Plankton in morphological space



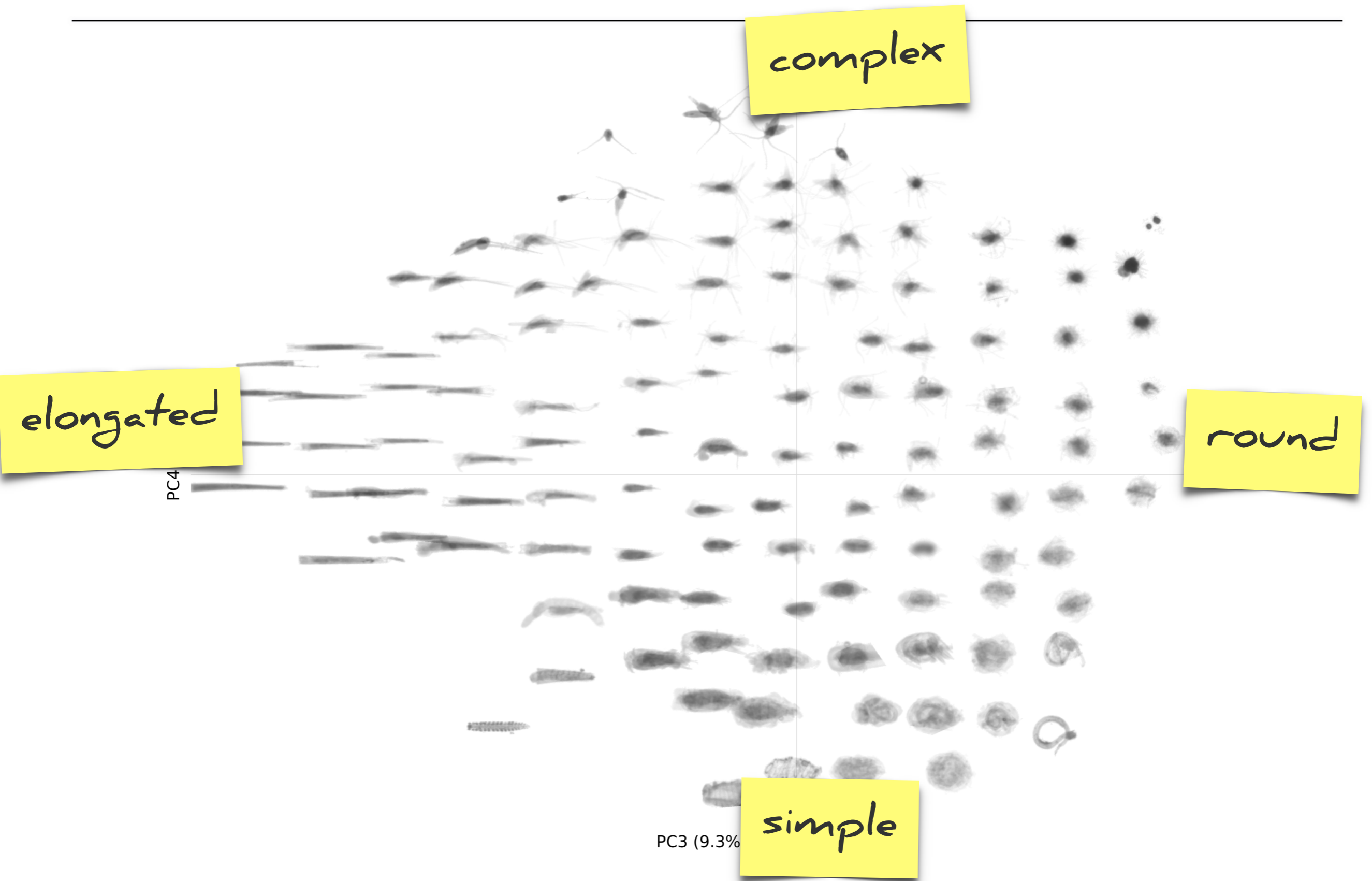
Plankton in morphological space



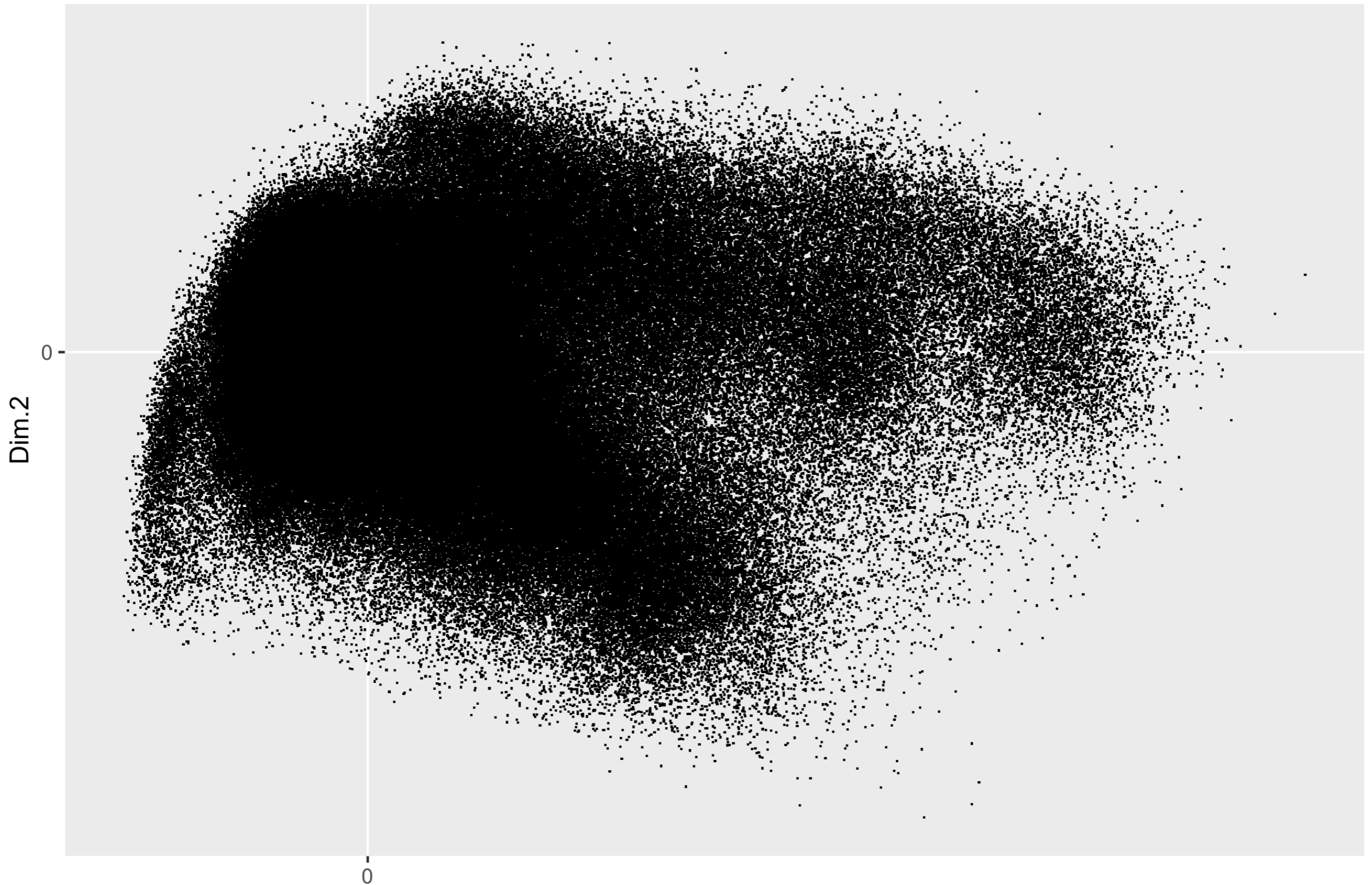
Plankton in morphological space



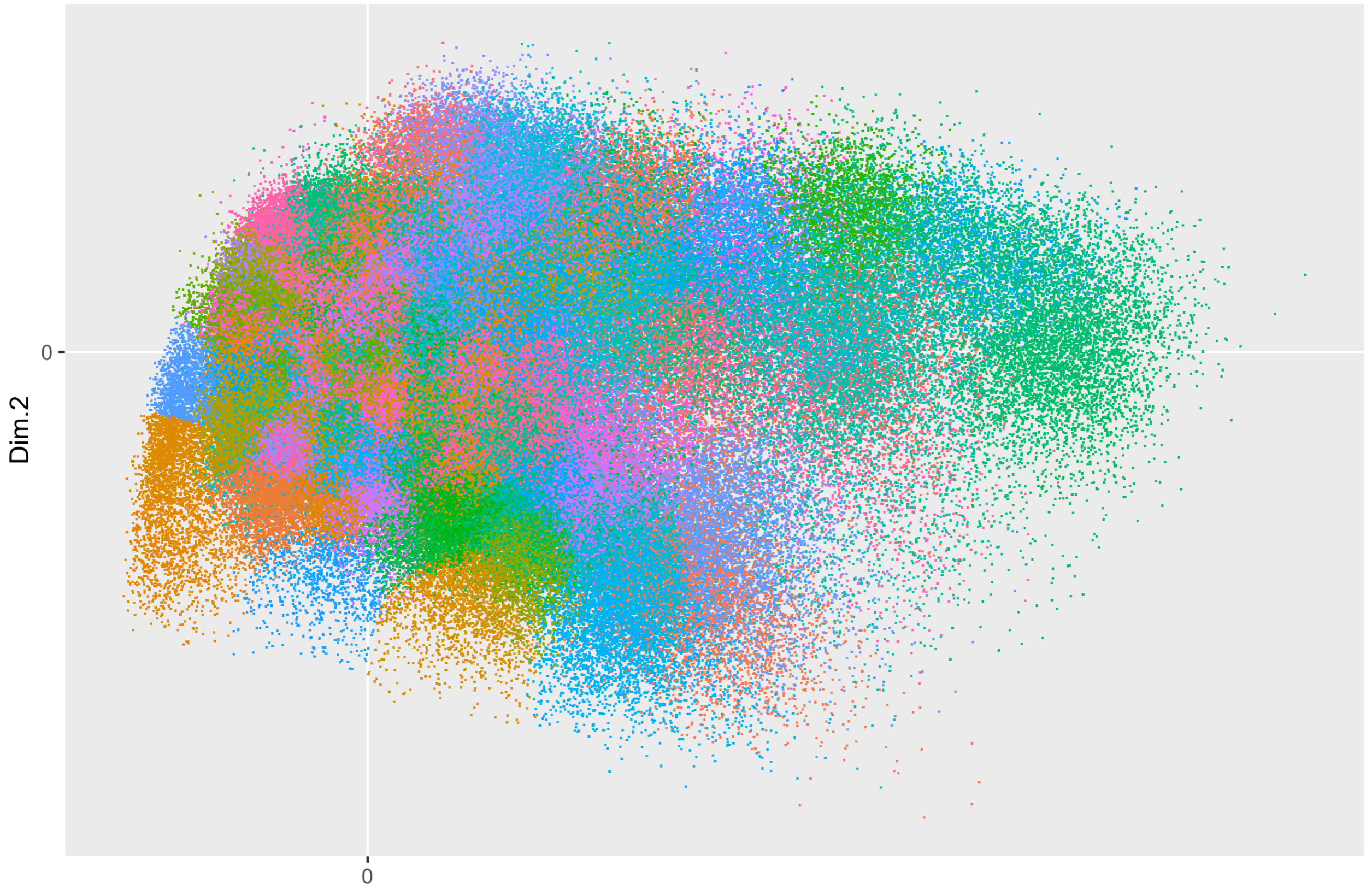
Plankton in morphological space



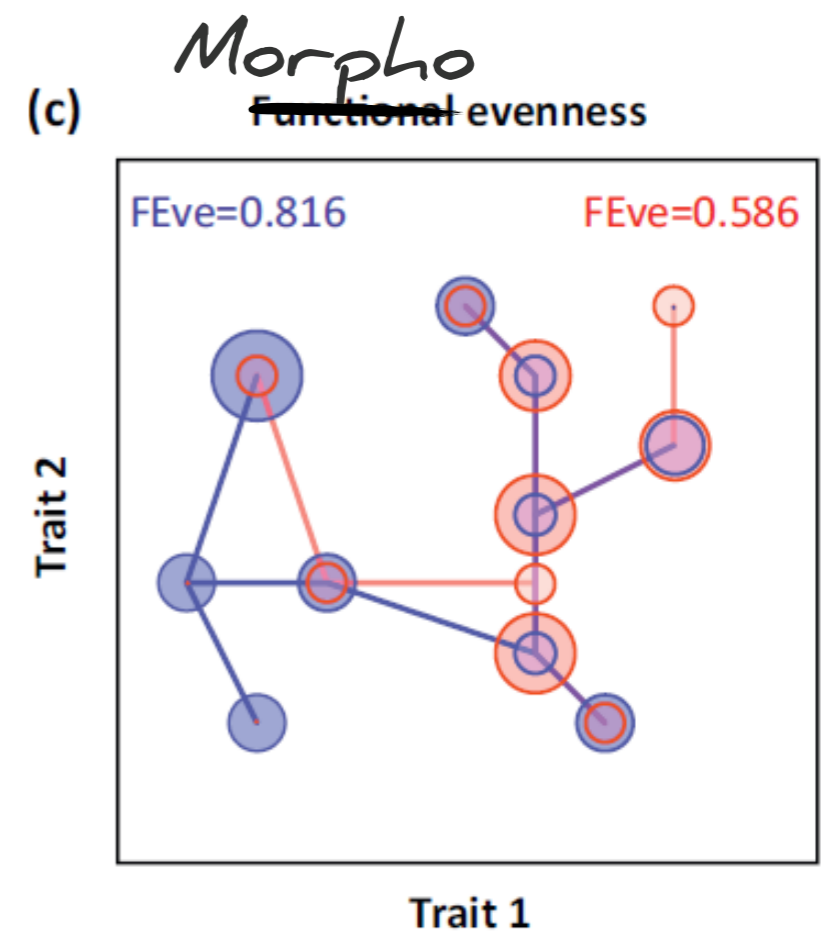
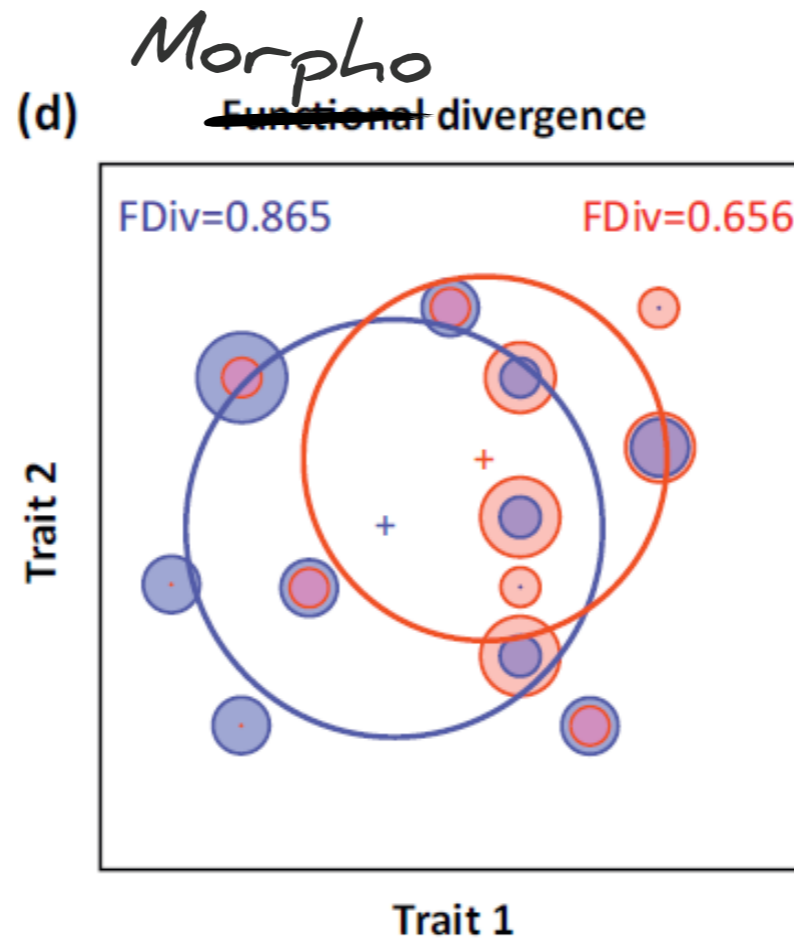
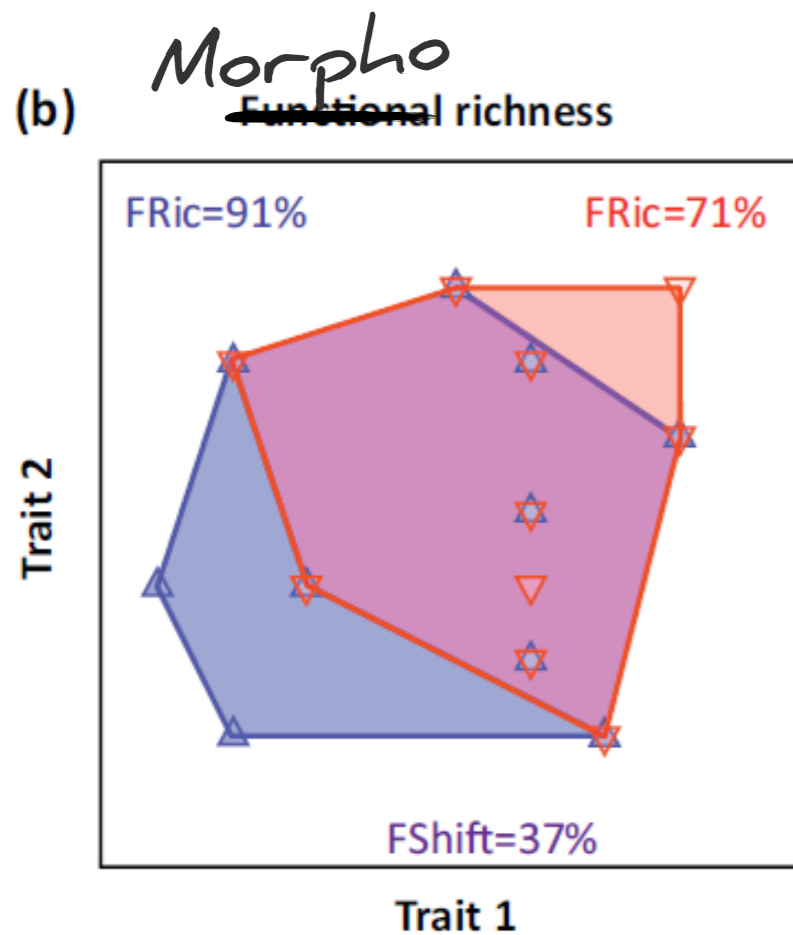
Define “morphs” (through objective clustering)



Define “morphs” (through objective clustering)



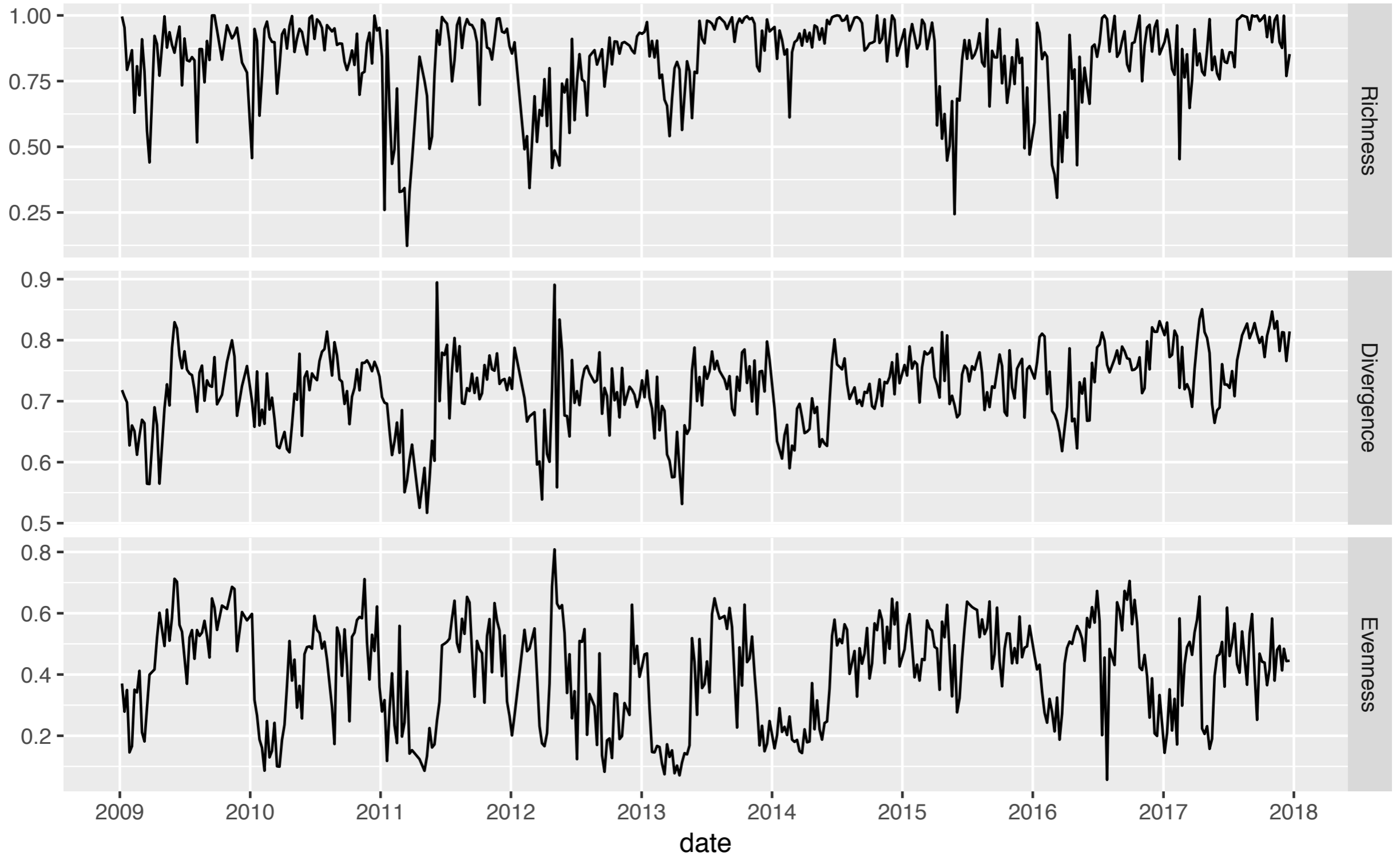
Compute morphological diversity indices (based on functional ones)



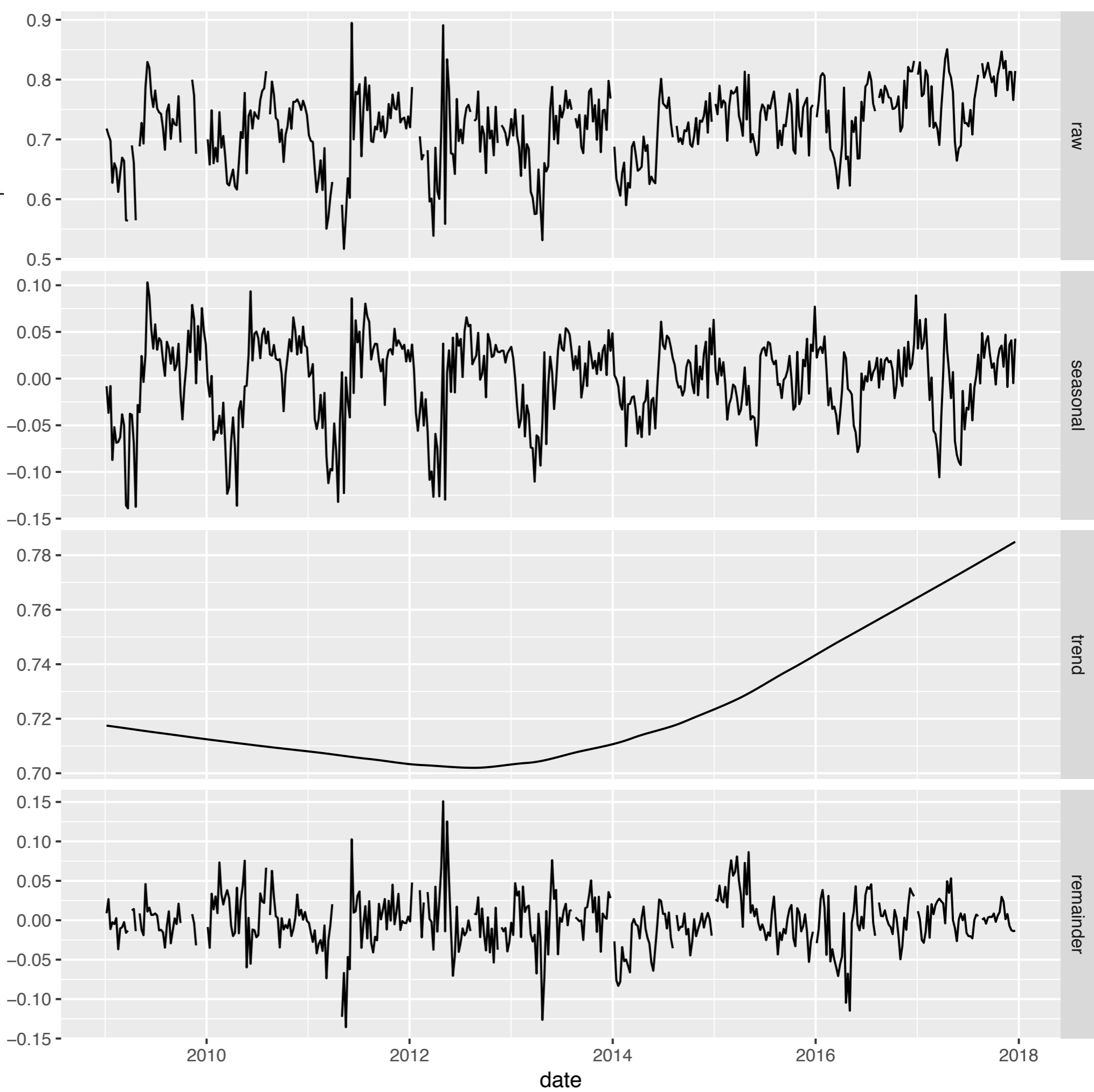
Shannon-like

Pielou-like

Weekly time series of indices



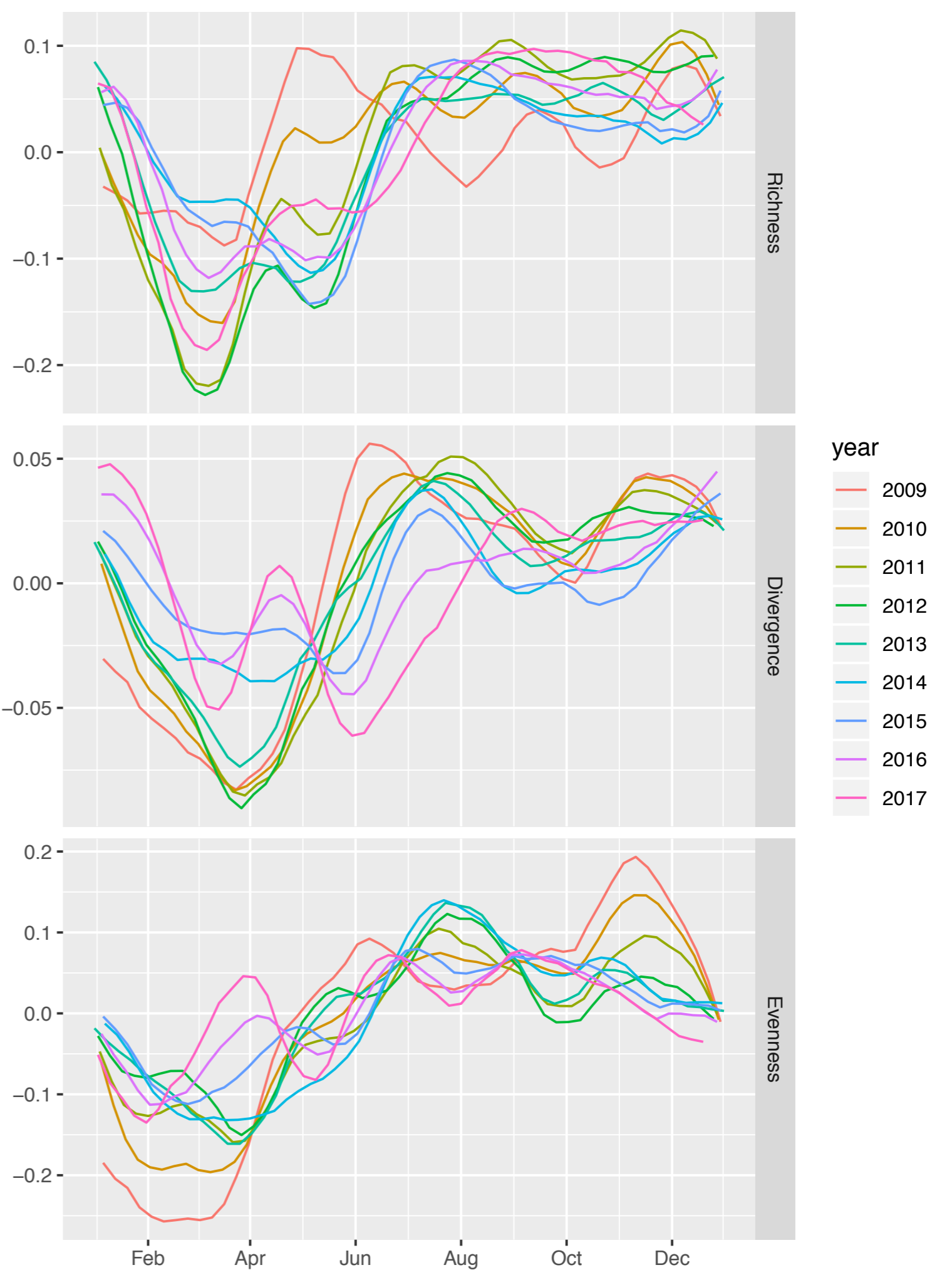
+ Season Trend

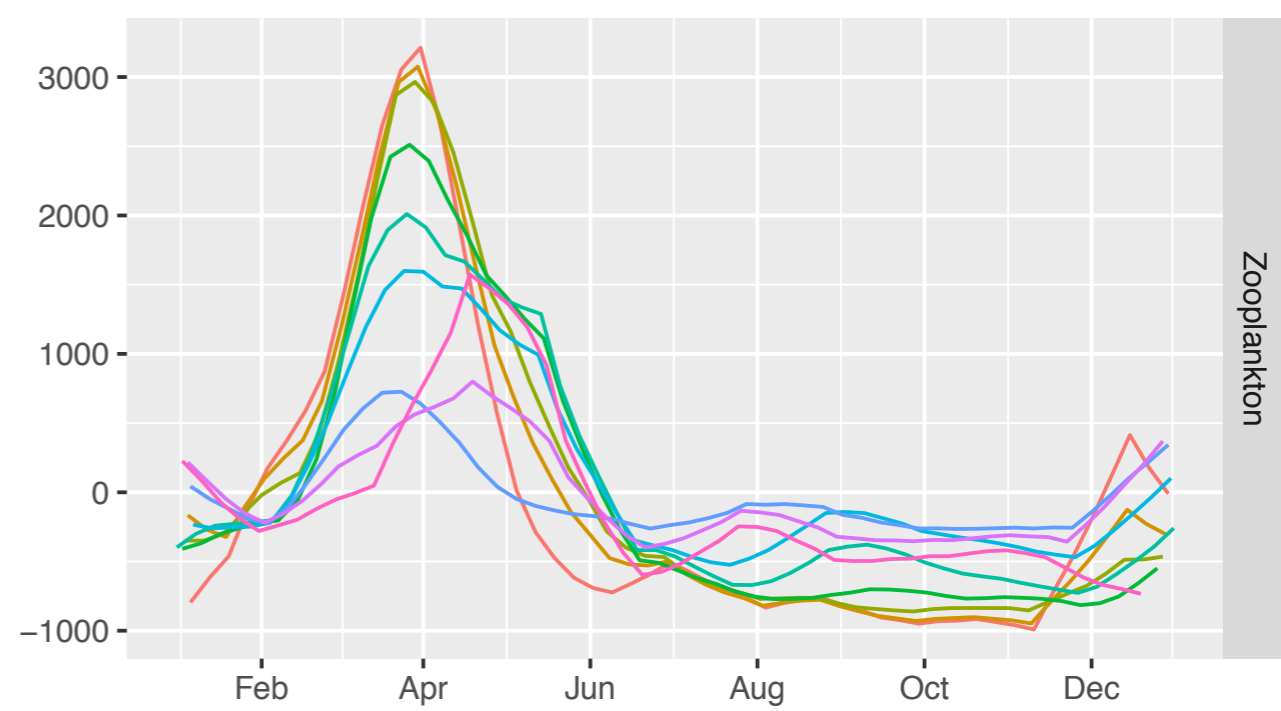
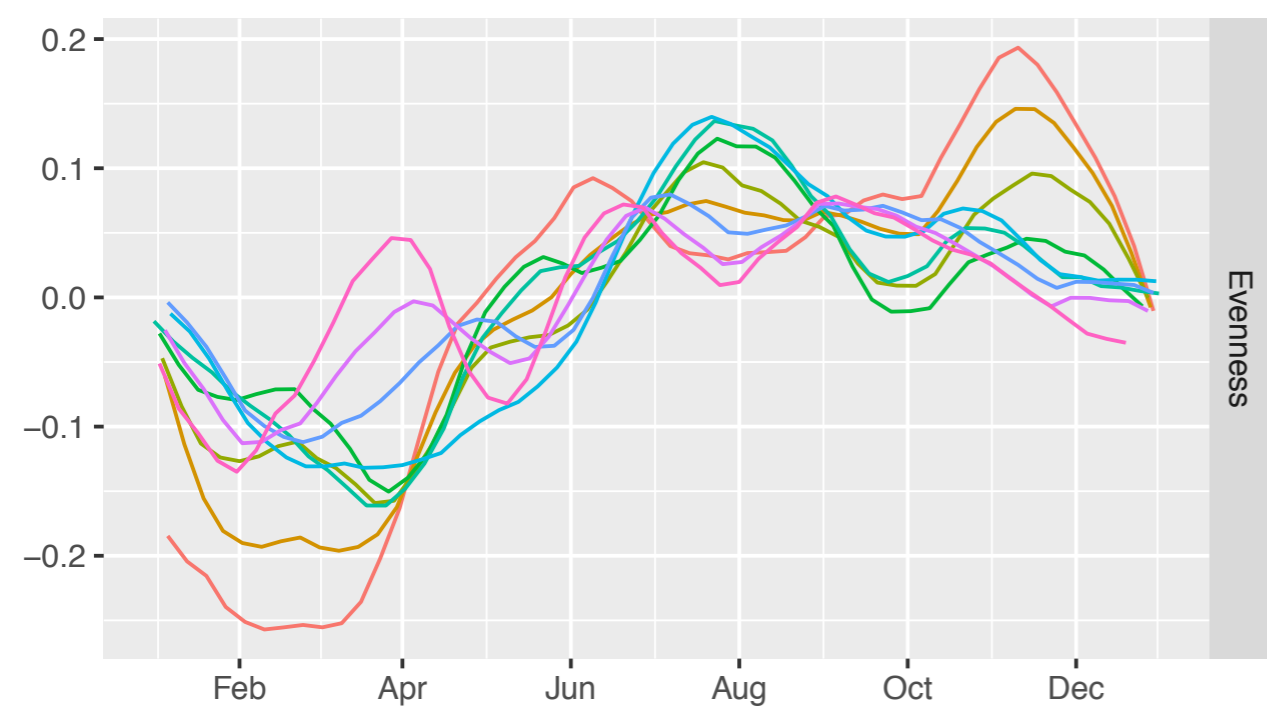
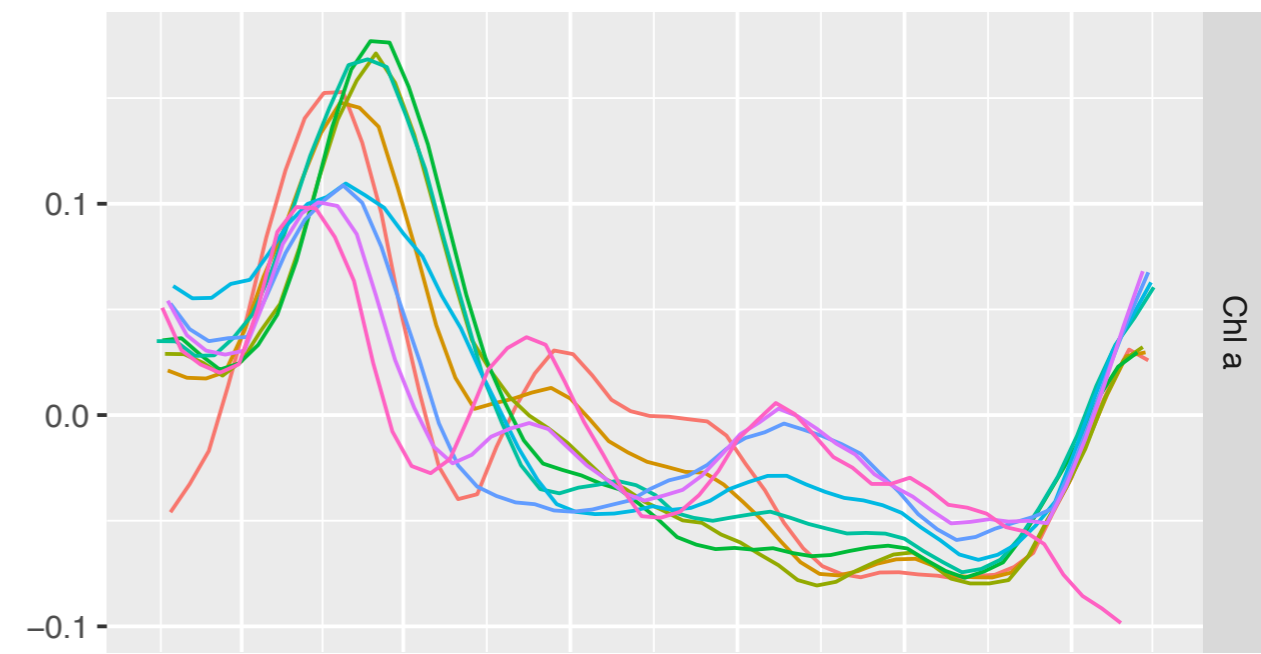
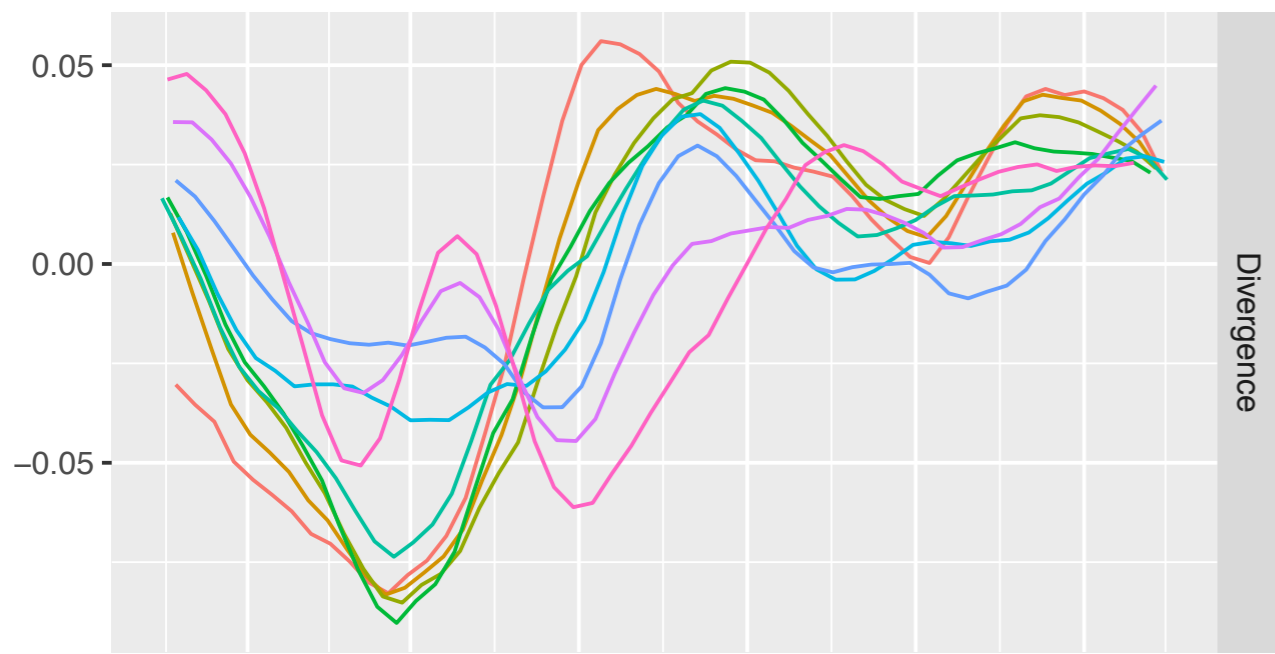
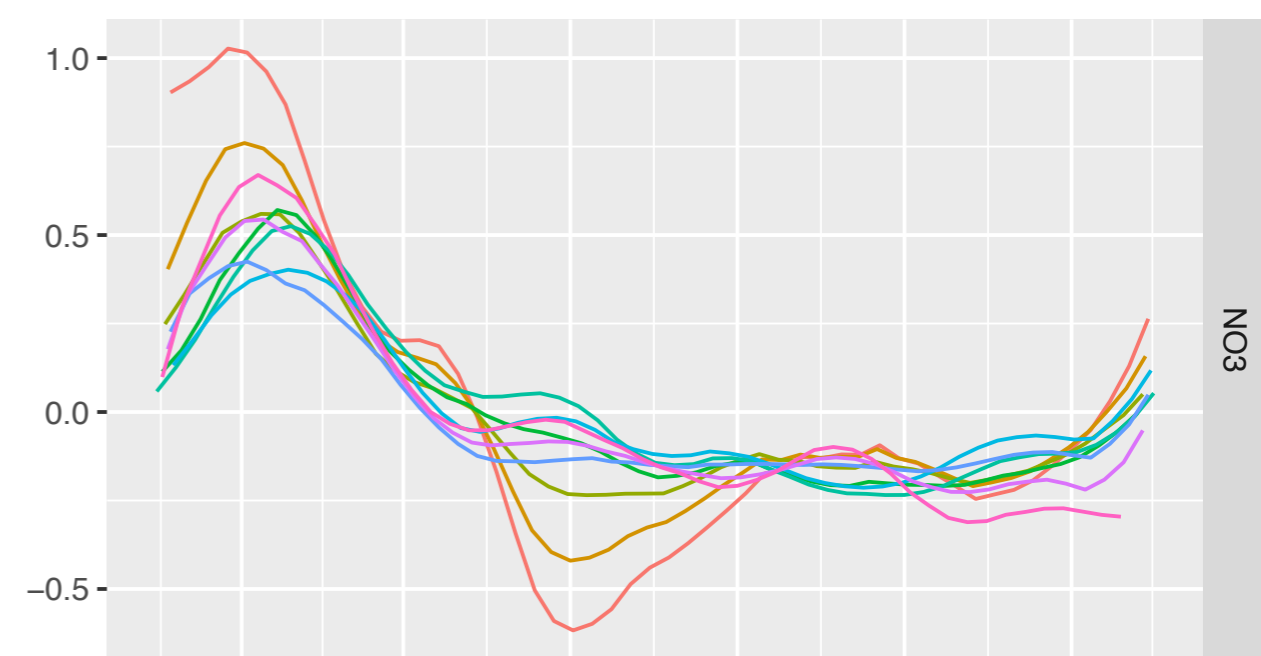
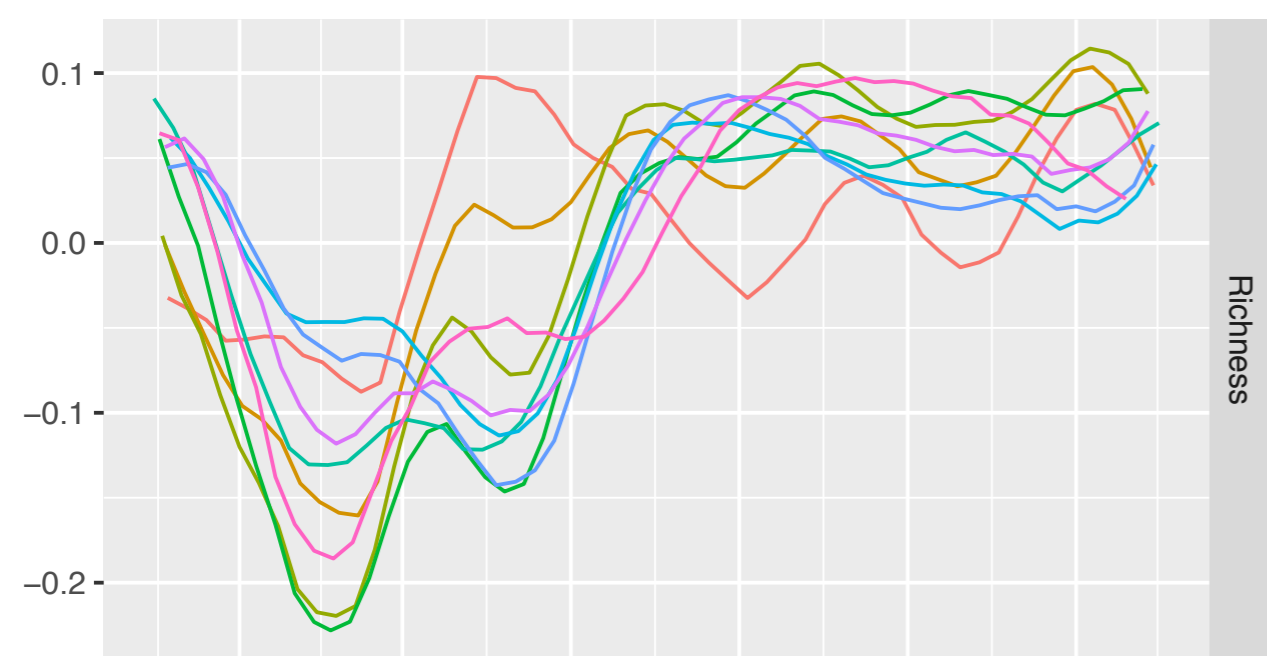


Season

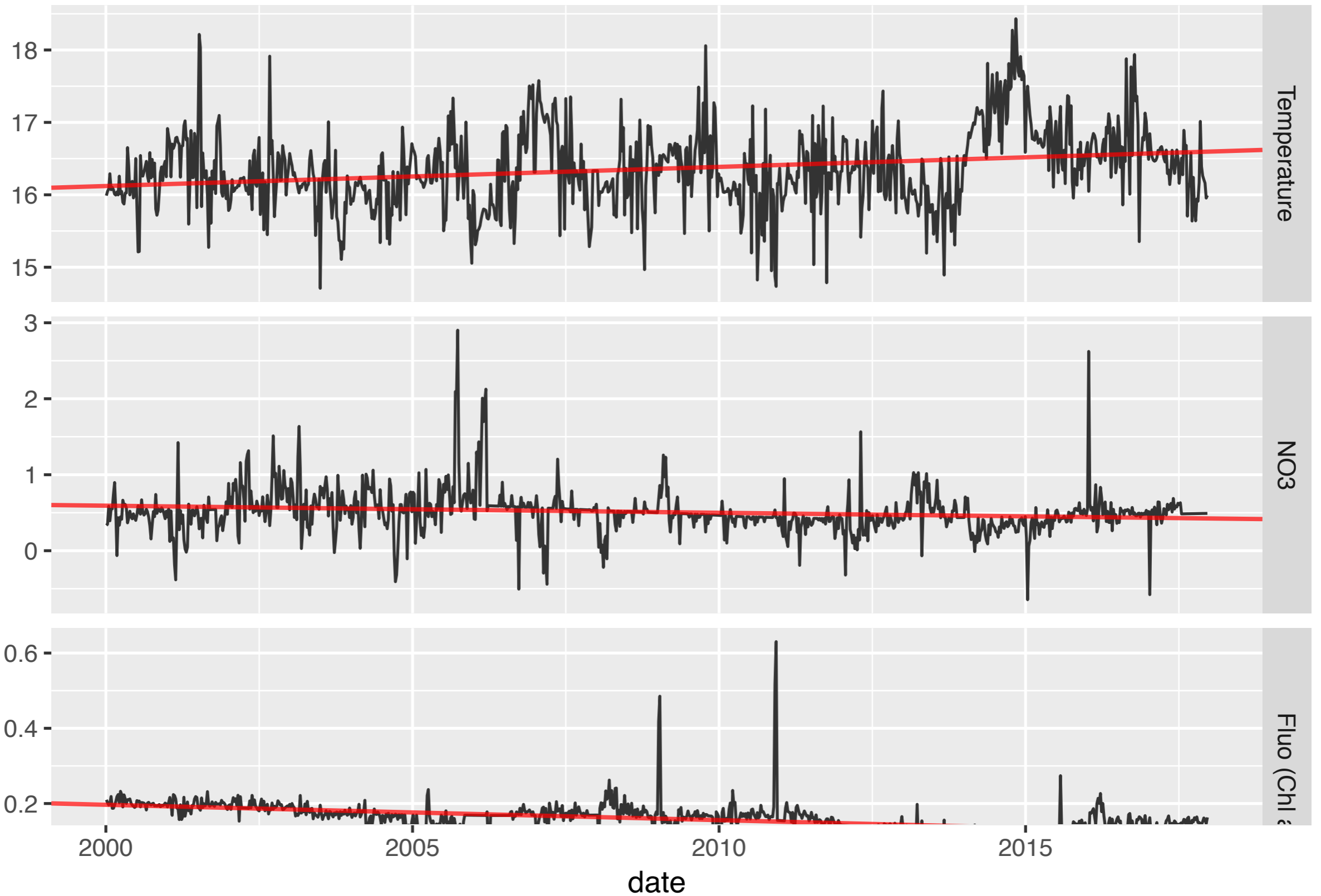
Decrease of morphological diversity in the spring

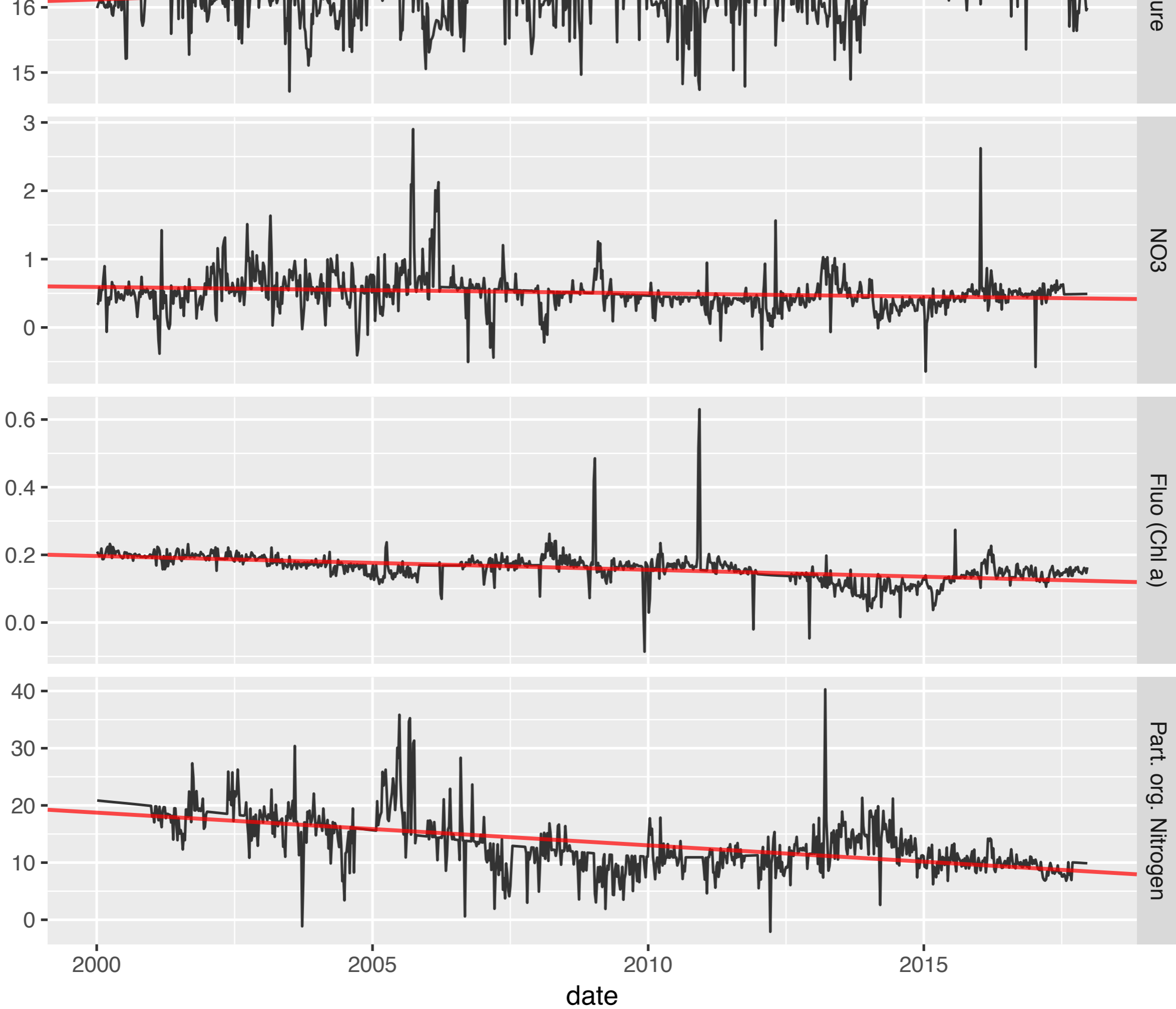
All indices and ~ all years are affected

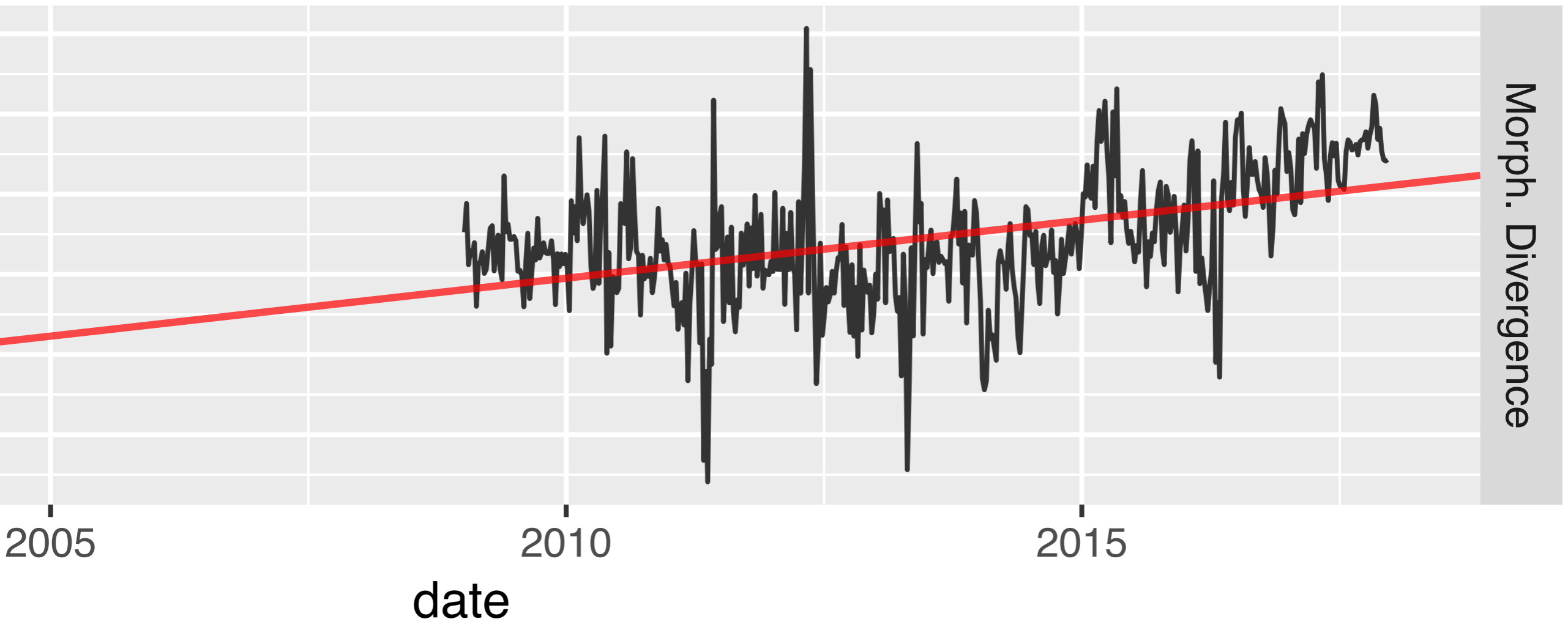
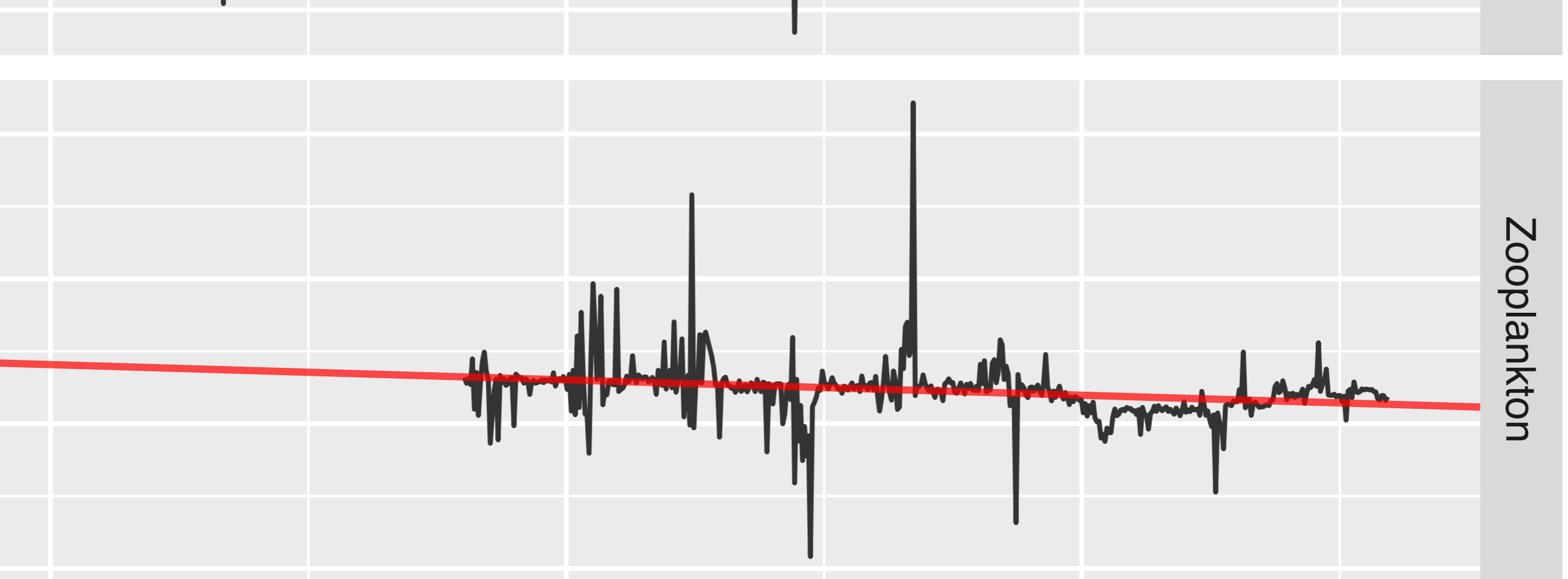




Trends







In summary

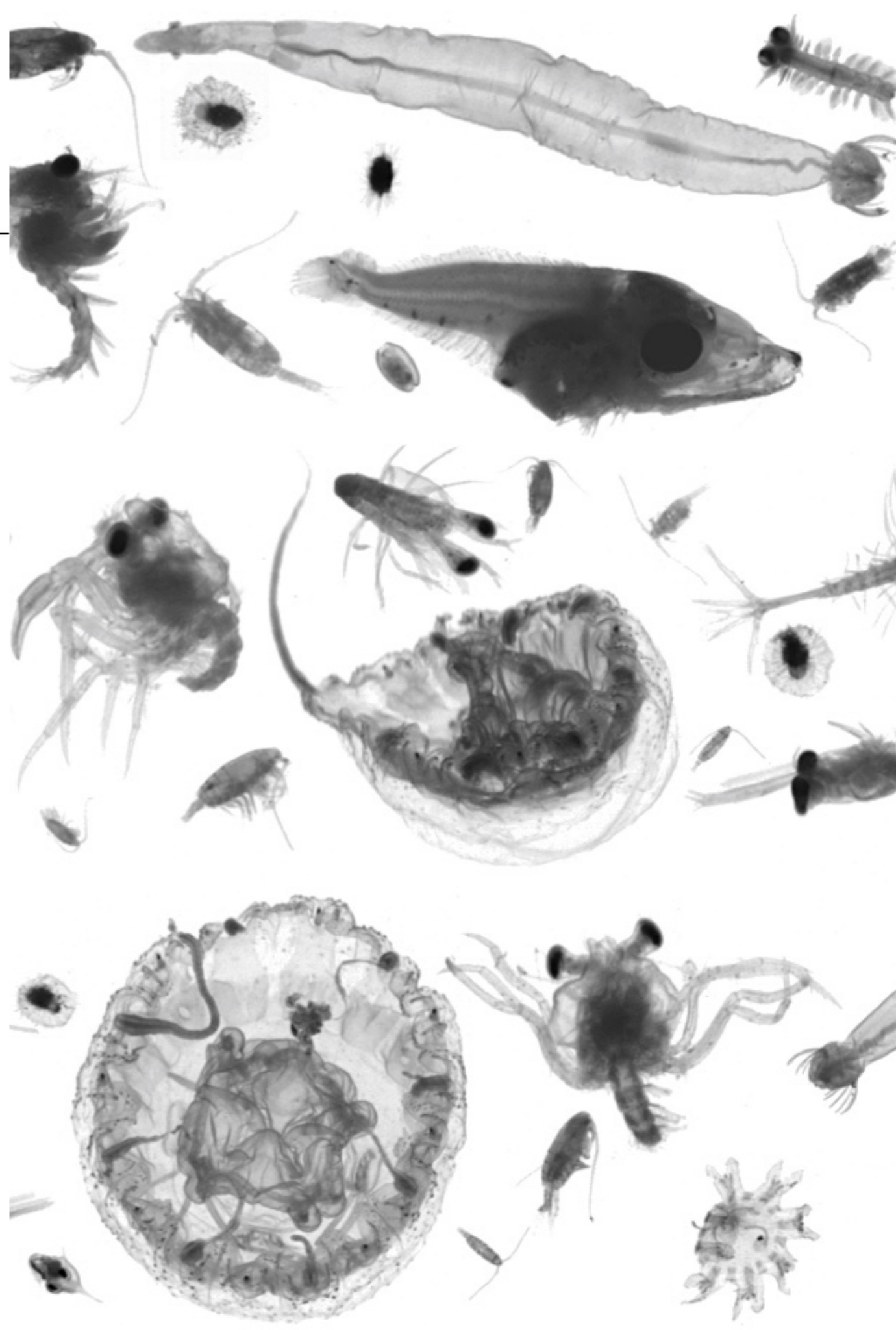
Consistent morphologies of zooplankton can be defined from generic descriptors

Morphological diversity **increases with oligotrophy**, seasonally and over the long term

Our interpretations:

dominance of generic forms (copepods) in the spring

reduction of the dominant **generalists** with oligotrophy





Thank you!

More applications of this technique:

Emilia Trudnowska
today, 14:30 - 14:45
session OB13B-03, SDCC - 2, UL

Virginie Sonnet
today, 16:00 - 18:00
poster IS14D, poster Hall C-D

Laure Vilgrain
thursday, 09:15 - 09:30
session HE41A-06, SDCC - 11B, UL

irisson@normalesup.org



Cailleton



Desnos



Elineau



Jalabert



Stemmann

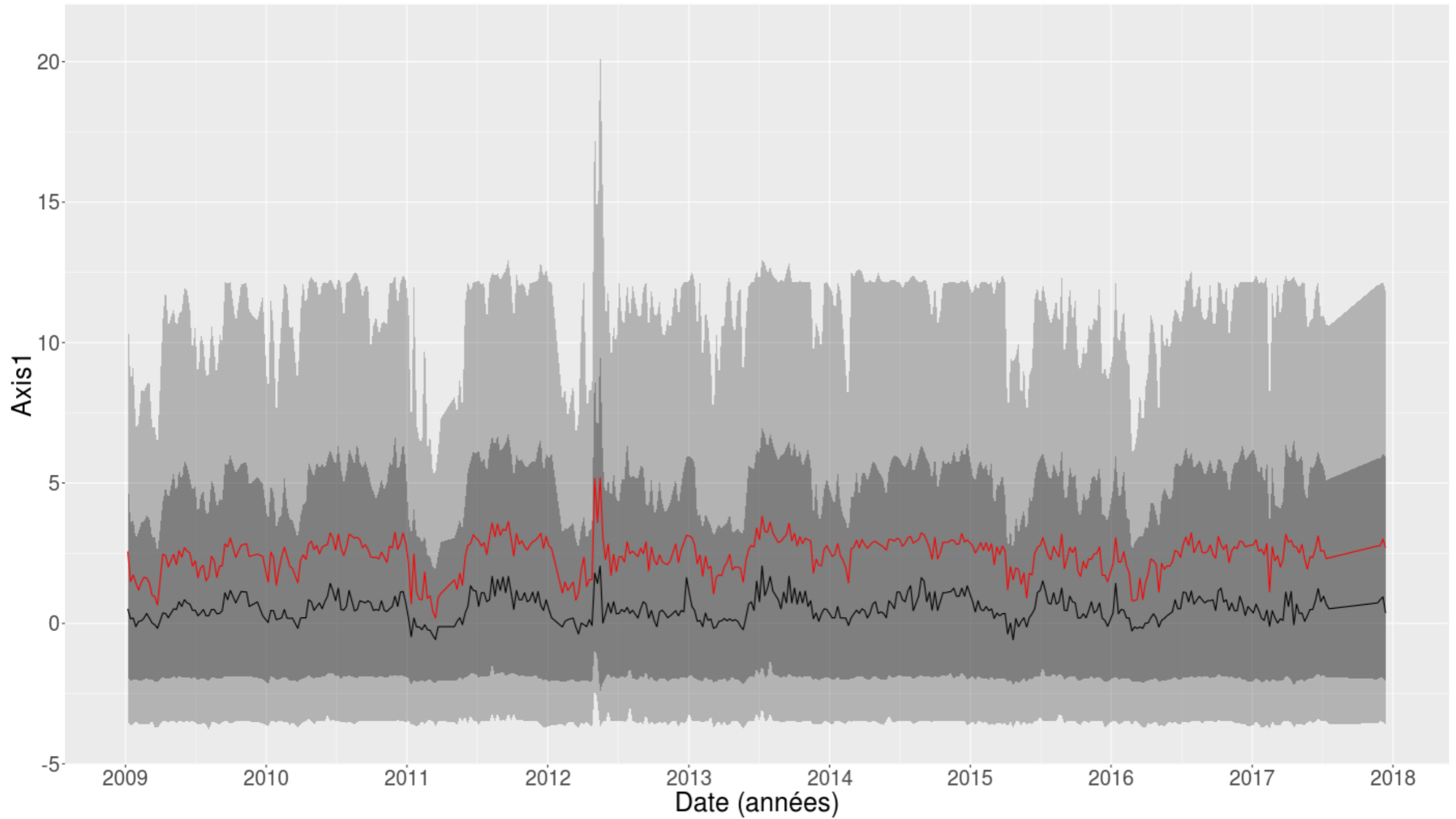


Ayata

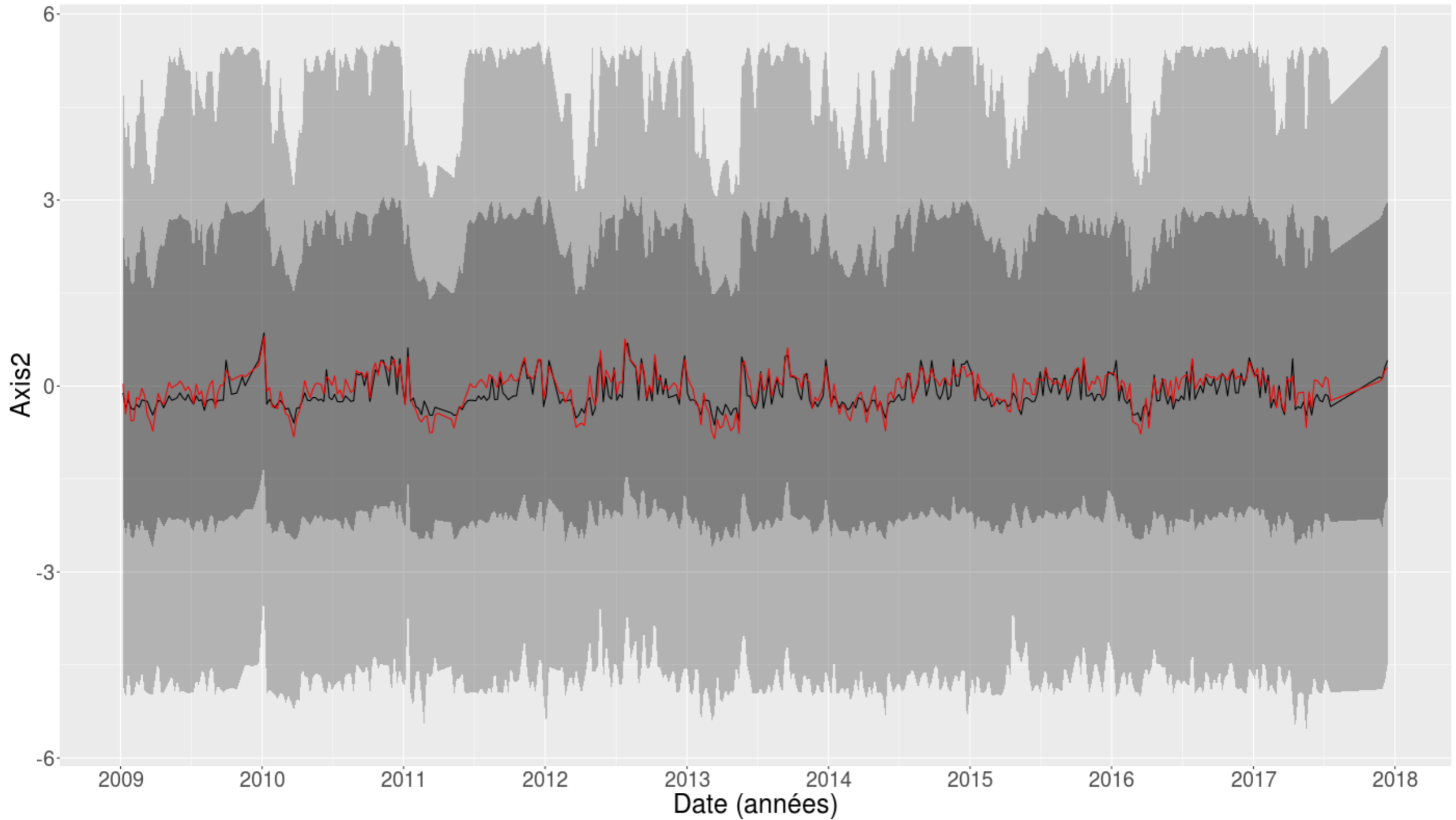


Irisson

PC1: Size



PC2: Opacity



Imaging effort/depth

