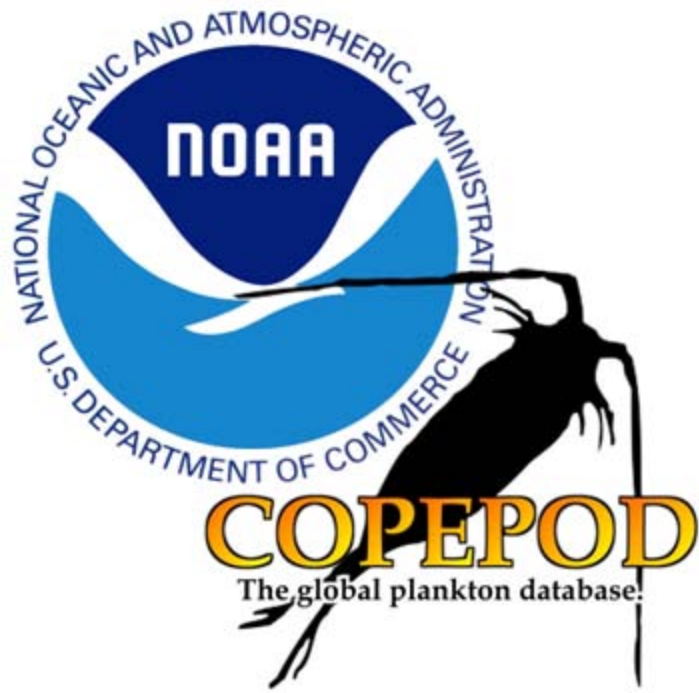


COPEPODITE

COPEPOD's Interactive Time-series Explorer



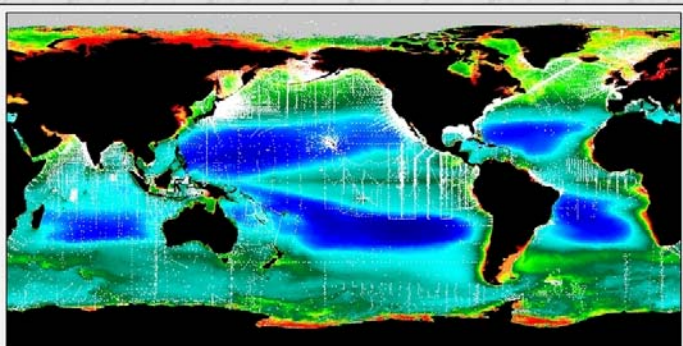
Todd D. O'Brien

NOAA Fisheries (NMFS)

The Coastal & Oceanic Plankton Ecology, Production, & Observation Database


NOAA COPEPOD Online Database

Online Database (search) < NMFIS-COPEPOD (main)



Click on a region in the map above or select from the options below.

BY TAXA



- Zooplankton*
- Phytoplankton* (abundance / presence / composition)
- Total Biomass* (wet mass / dry-wt / settl-vol)
- Additional Categories (bacteria, ichthyoplankton, ...)

BY REGION


Major Basins:

Atlantic Ocean (North | South)
Pacific Ocean (North | South)
Indian Ocean - Arctic - Antarctic

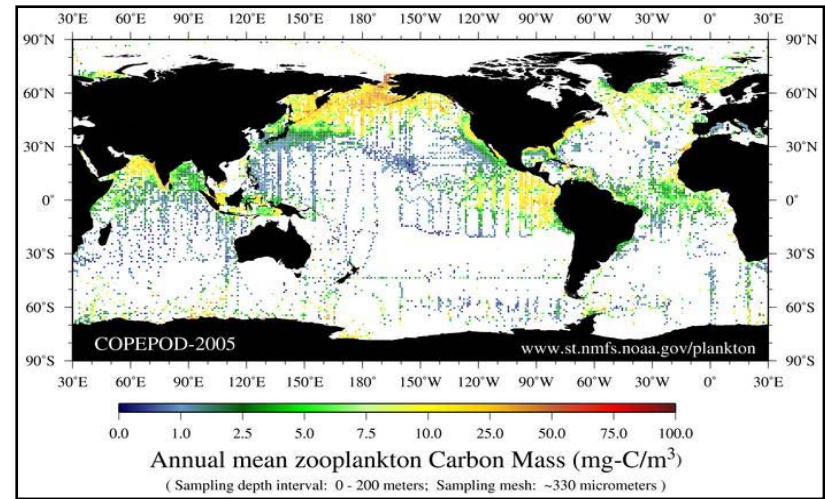
Minor Basins:

Gulf of Mexico & Caribbean
Mediterranean Seas
Baltic - Indonesia - Bering Sea

BY METADATA



- by Ship or Cruise
- by Project
- by Investigator
- by Institute
- by Country



NOAA COPEPOD CalCOFI

Zooplankton biomass (displacement volume) sampled during the U.S. East Coast Cooperative Oceanic Fisheries Investigations (CalCOFI) program.

Plankton Data Content

Temporal Sampling Coverage

Ship & Cruise Summary

Sampling Metadata

Investigator Credit

Data Access & Formats

Data Distribution Map

World Location Map

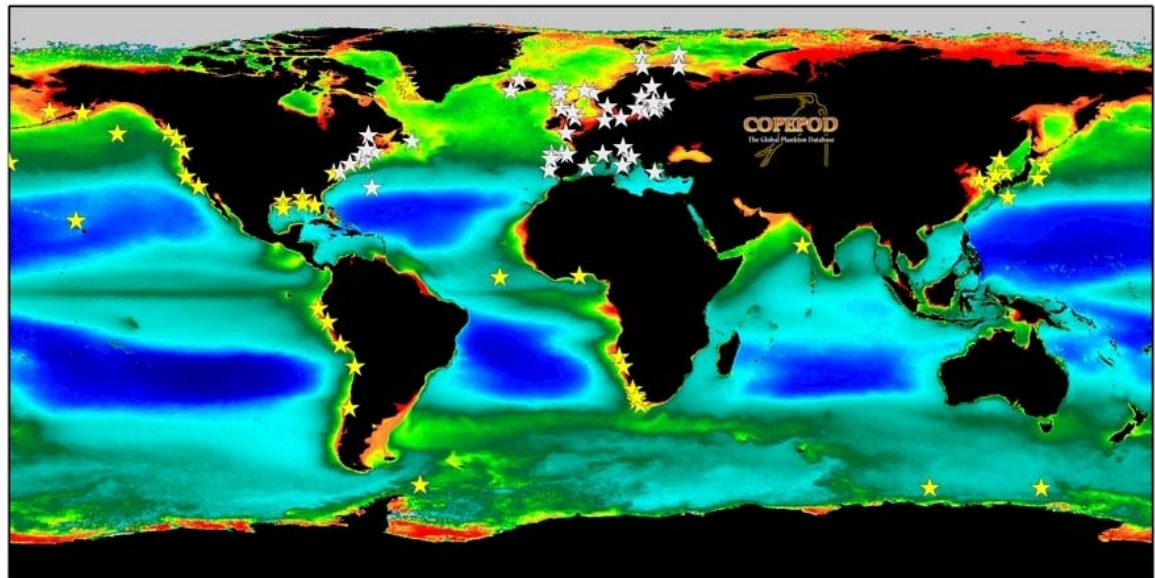
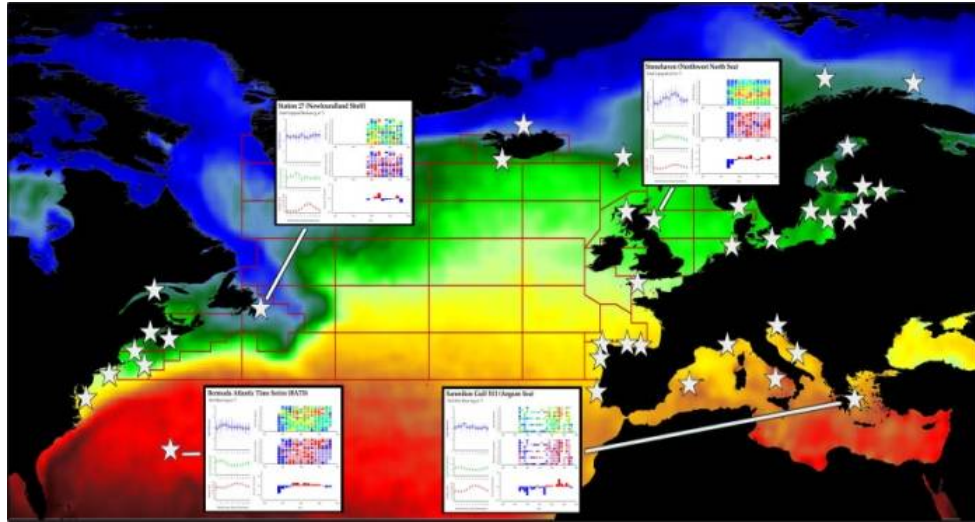
Database Version Control

NOAA COPEPOD SHIP & CRUISE SUMMARY

Akademik A. Kovalevskiy (90AK)							CruiSe Dates	CruiSe Dates
Start Date	End Date	Days Cruised	Ship	Days	TOTAL STATIONS (100m)	CruiSe Report	See context of location on the globe	
11-Sep-1964	02-Sep-1965	1	0	0	0	Full Report (html)	Full Report (html) - CDF	
17-Oct-1964	03-Nov-1964	39	0	0	39	Full Report (html)	Full Report (html) - CDF	
04-Dec-1964	17-Dec-1964	6	0	0	6	Full Report (html)	Full Report (html) - CDF	
13-Jan-1965	15-Jan-1965	2	0	0	2	Full Report (html)	Full Report (html) - CDF	
18-Feb-1965	21-Feb-1965	7	0	0	7	Full Report (html)	Full Report (html) - CDF	

ICES-WGZE & SCOR-WG125

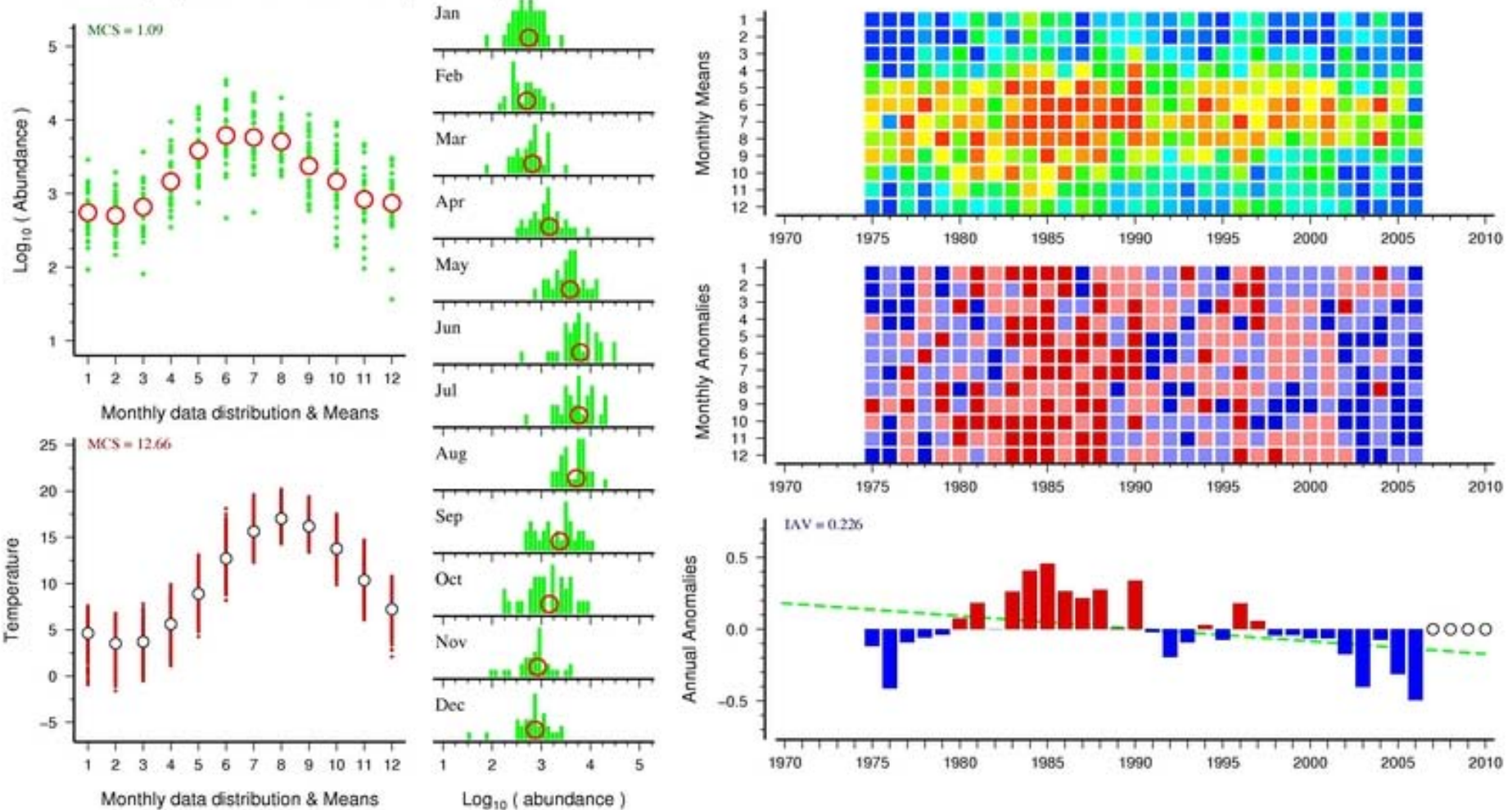
Time-series data support & visualization



The WG125 Standard Plot

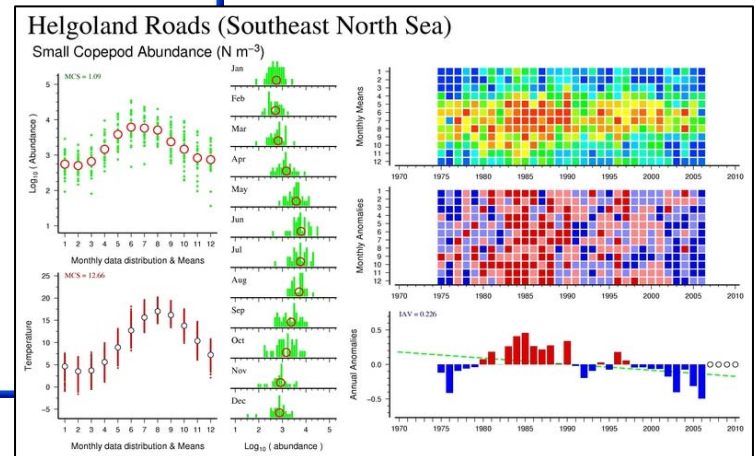
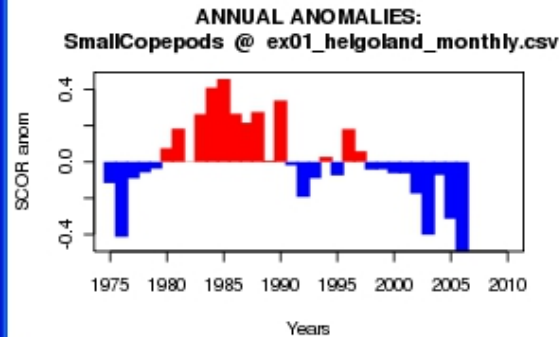
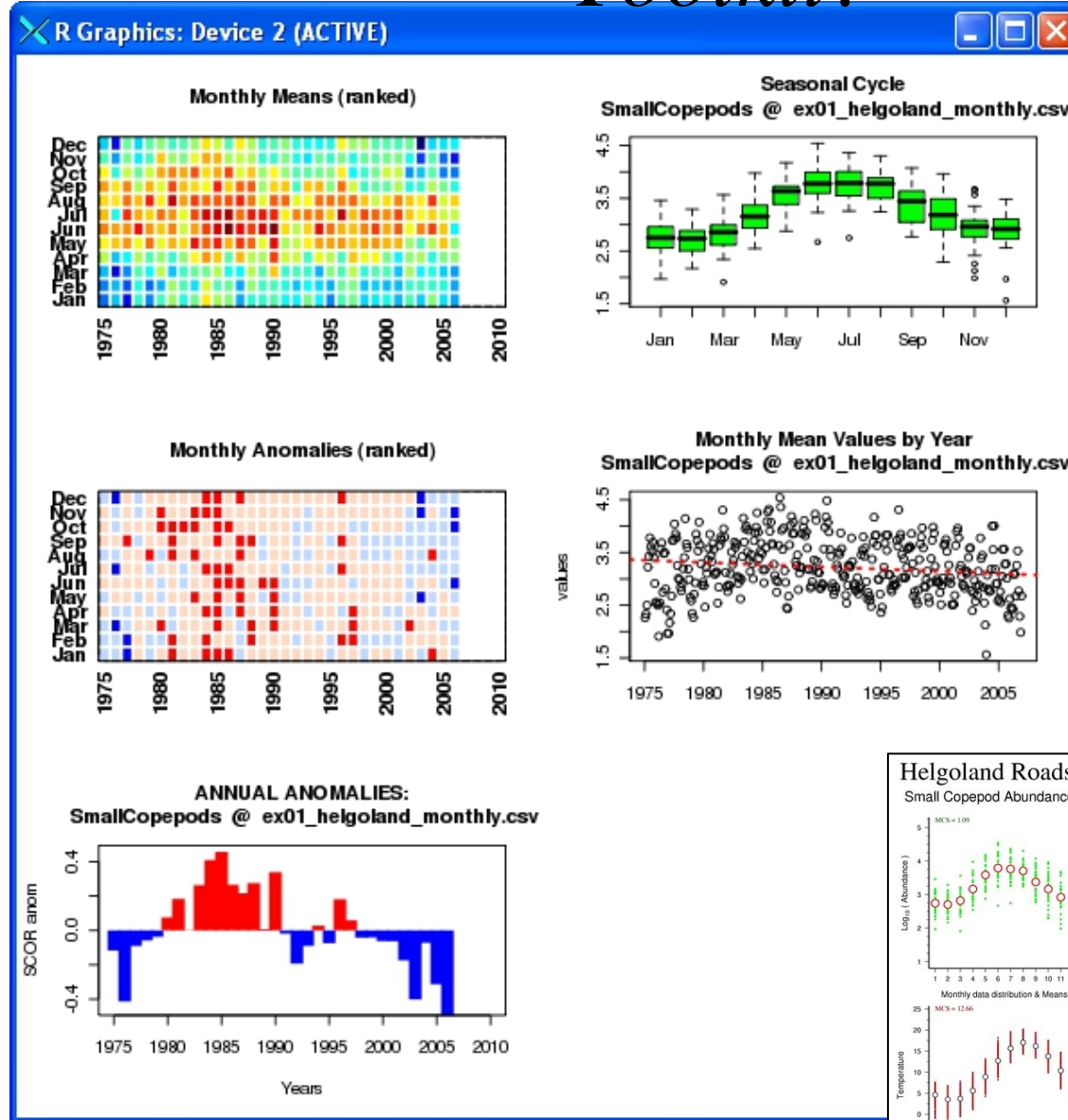
Helgoland Roads (Southeast North Sea)

Small Copepod Abundance ($N\ m^{-3}$)



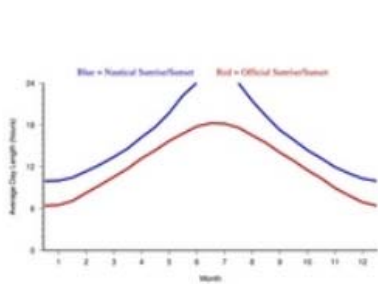
What happened to the WGI23 R

Toolkit?

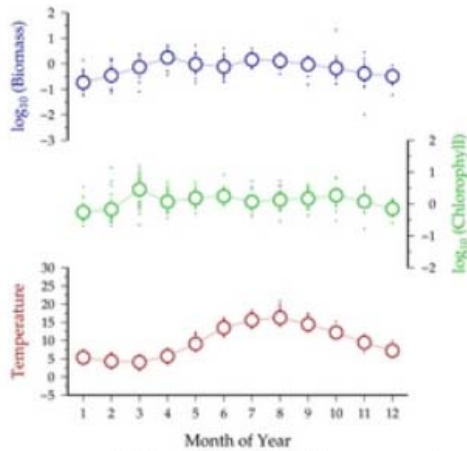


Location-derived Supporting Data

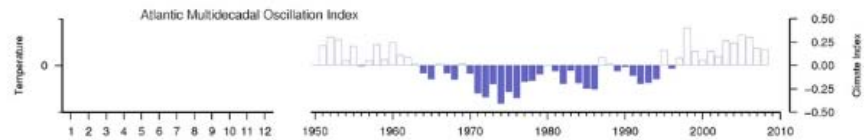
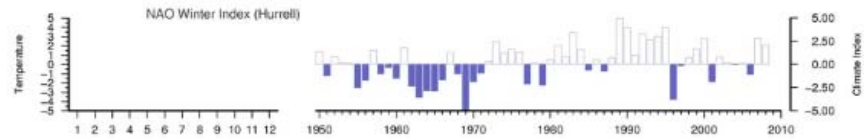
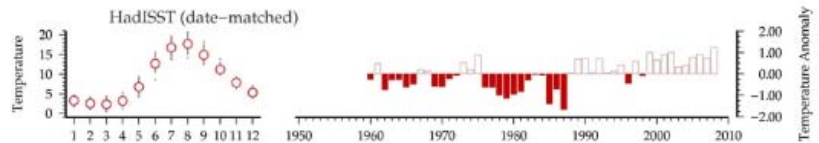
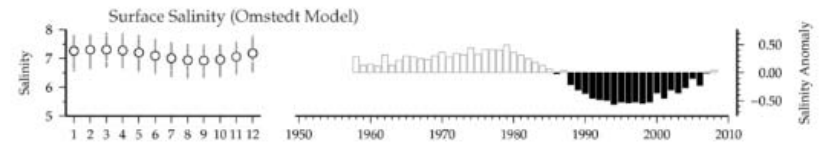
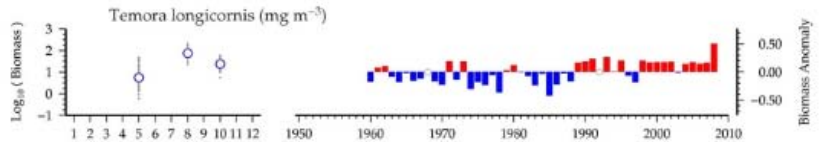
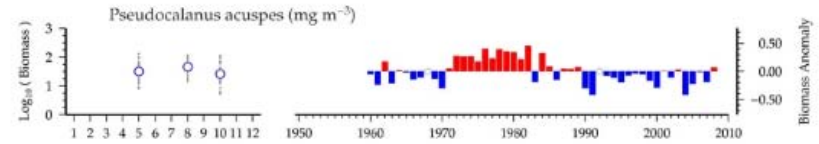
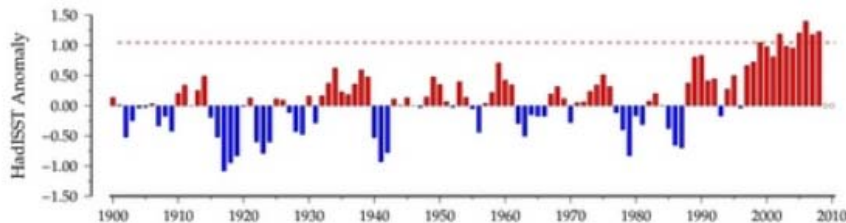
- Reynolds SST
- HadISST
- Model Products (e.g., Omstedt Salinity)
- Satellite-based fields (Chl-A, MLD, Wind)
- Local Day length
- Climate Indices



Seasonal day length at site.



Seasonal bio, chloro, and SST at site.



The challenge:

How to make these various “in-house” tools accessible to the outside user?



COPEPODITE

Interactive Time-series Explorer

*Version "C1" will be available **April 1st** at:*
<http://copepodite.org>



COPEPODITE

Interactive Time-series Explorer

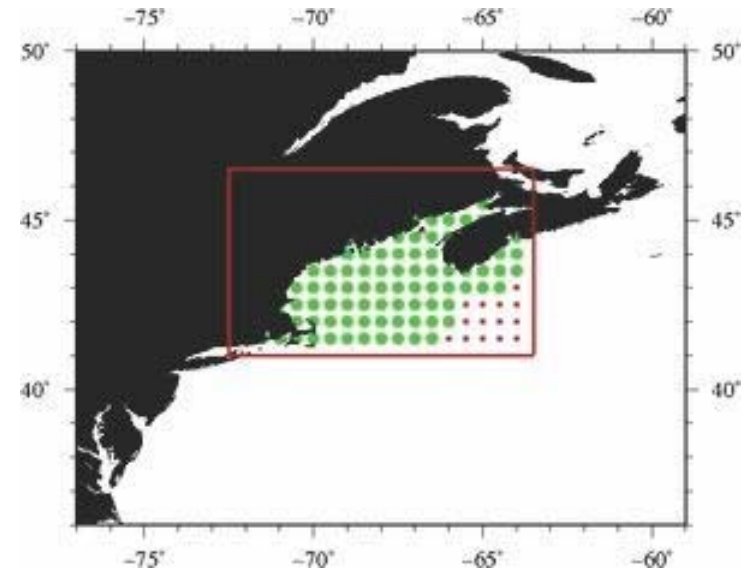
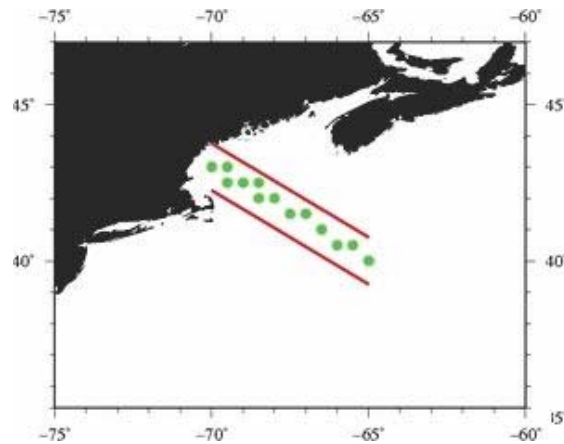
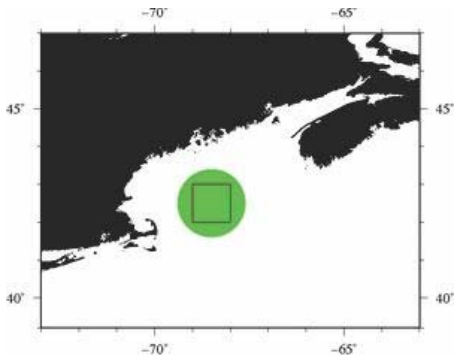
- No software required (beyond a web browser + internet).
- User can upload their own time-series data using a simple yet very flexible spreadsheet “CSV” format.
- System will automatically generate supporting data for the user’s specified geographic point or region.
- User can select from a variety of visualizations and analyses (with new additions and options added in future).
- Results are reported in a stand-alone, interactive web interface. Zip download allows user to keep results locally.



COPEPODITE

Interactive Time-series Explorer

- **Step 1:** Select your site's geographic point, transect, or area (with/without bathymetry set).

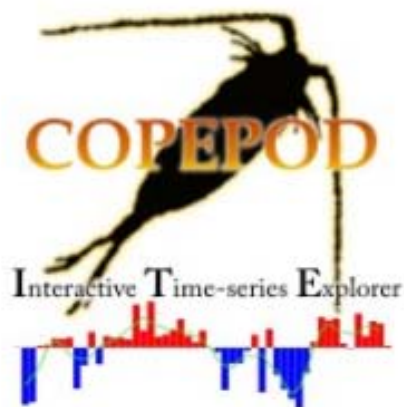




COPEPODITE

Interactive Time-series Explorer

- **Step 2:** Email address, Data File, Site Name.



Required Parameters:

- Email Address *:

** Your email address is needed so we can let you know when your data are ready.*

- Time-Series Data File*:

** Make sure you read the [INCOMING DATA FORMAT GUIDE](#) before submitting this!
(The "Format Guide" link above will open a new window, so you can safely do it now.)*

- The name of your Site*:

** This will be printed at the top of your figure sets.*

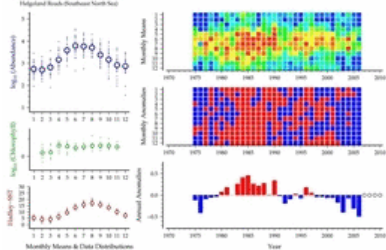


COPEPODITE

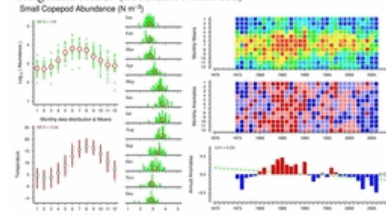
Interactive Time-series Explorer

- **Step 3:** Select graphic/analysis modules.

Small Copepod Abundance (N m⁻³)



Helgoland Roads (Southeast North Sea)

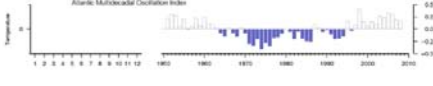
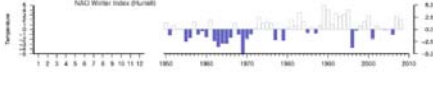
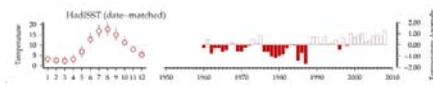
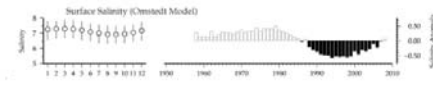
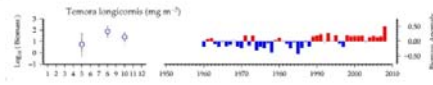
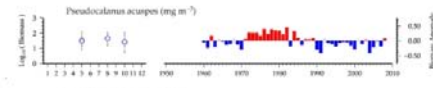


COPEPOD Interactive Time-series Explorer

Select the variables to plot

Small Copepod Abundance (N m⁻³) Pseudocalanus scapens (mg m⁻³) Temora longicornis (mg m⁻³) Surface Salinity (Chmstedt Model) HadSST (date-matched) NAO Winter Index (Jury) Atlantic Multidecadal Oscillation Index

To see complete plots (with correlation values) click on the link to see related maps, or click on the link to see related time series.



Variable & Climate Correlations:

- [[1]] POC: Small Copepod Abundance (N m⁻³)
- [[1]] POC: Pseudocalanus scapens (mg m⁻³)
- [[1]] POC: Temora longicornis (mg m⁻³)
- [[1]] POC: Surface Salinity (Chmstedt Model)
- [[1]] POC: HadSST (date-matched)
- [[1]] POC: NAO Winter Index (Jury)
- [[1]] POC: Atlantic Multidecadal Oscillation Index

Variable & Climate Correlations:

- [[1]] POC: Small Copepod Abundance (N m⁻³)
- [[1]] POC: Pseudocalanus scapens (mg m⁻³)
- [[1]] POC: Temora longicornis (mg m⁻³)
- [[1]] POC: Surface Salinity (Chmstedt Model)
- [[1]] POC: HadSST (date-matched)
- [[1]] POC: NAO Winter Index (Jury)
- [[1]] POC: Atlantic Multidecadal Oscillation Index

Variable & Climate Correlations:

- [[1]] POC: Small Copepod Abundance (N m⁻³)
- [[1]] POC: Pseudocalanus scapens (mg m⁻³)
- [[1]] POC: Temora longicornis (mg m⁻³)
- [[1]] POC: Surface Salinity (Chmstedt Model)
- [[1]] POC: HadSST (date-matched)
- [[1]] POC: NAO Winter Index (Jury)
- [[1]] POC: Atlantic Multidecadal Oscillation Index

Variable & Climate Correlations:

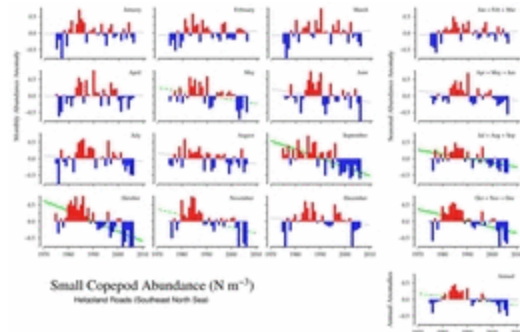
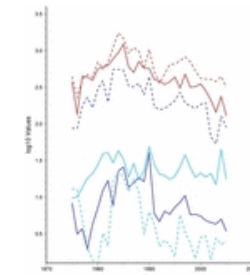
- [[1]] POC: Small Copepod Abundance (N m⁻³)
- [[1]] POC: Pseudocalanus scapens (mg m⁻³)
- [[1]] POC: Temora longicornis (mg m⁻³)
- [[1]] POC: Surface Salinity (Chmstedt Model)
- [[1]] POC: HadSST (date-matched)
- [[1]] POC: NAO Winter Index (Jury)
- [[1]] POC: Atlantic Multidecadal Oscillation Index

Variable & Climate Correlations:

- [[1]] POC: Small Copepod Abundance (N m⁻³)
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- [[1]] POC: Surface Salinity (Chmstedt Model)
- [[1]] POC: HadSST (date-matched)
- [[1]] POC: NAO Winter Index (Jury)
- [[1]] POC: Atlantic Multidecadal Oscillation Index

Variable & Climate Correlations:

- [[1]] POC: Small Copepod Abundance (N m⁻³)
- [[1]] POC: Pseudocalanus scapens (mg m⁻³)
- [[1]] POC: Temora longicornis (mg m⁻³)
- [[1]] POC: Surface Salinity (Chmstedt Model)
- [[1]] POC: HadSST (date-matched)
- [[1]] POC: NAO Winter Index (Jury)
- [[1]] POC: Atlantic Multidecadal Oscillation Index



Small Copepod Abundance (N m⁻³)



COPEPODITE

Interactive Time-series Explorer

- **Step 4:** Click “Submit”.
- You will receive an email with a 32-character UID link to a private web page showing your results.
- In addition to online viewing, there is a “zip” link which you can easily download and extract the results interface, images, and analysis output.
- The online result files are deleted after one week.

What about the “data upload format”?

- The format was designed and battle-tested on hundreds of WGZE and WG125 data sets.
- The top row is keyword column descriptions:
 - DATE-YMD, DATE-MDY, DATE-DMY, (Julian?)
 - BIOM, ABND, ABDT,
 - TEMP, PSAL, CHLA, LOTH, OTHR

ABND= Total Copepods (#/m³)

ABDT= Calanus finmarchicus C5 (#/m²)

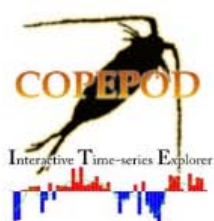
Flexible Date Handling & Automatic Synchronization

- The data in the “data columns” match to first “date column” (of dates) located to their left.

DATE 1	(date 1)	(date 1)	DATE 2	(date 2)	(date 2)	DATE 3	(date 3)
DATE-YMD	BIOM= Wet Mass	ABND= Total Zoo	DATE-DMY	TEMP= SST	PSAL= Salinity	DATE-MDY	CHLA= Chlorophyll-a
	123	43323		17.1	34.124		1.23
	34	23456		18.1	34.324		0.34
Monthly	122	642	Daily	18.4	34.324	Weekly	1.22
	158	34236		17.5	33.985		1.58
	1008	23435		14.5	34.102		1.00
	300	65456		12.1	34.354		3.00

- Version “C1” bins to months.
- Version “C2” will offer a weekly bin

Version "C1" Correlations

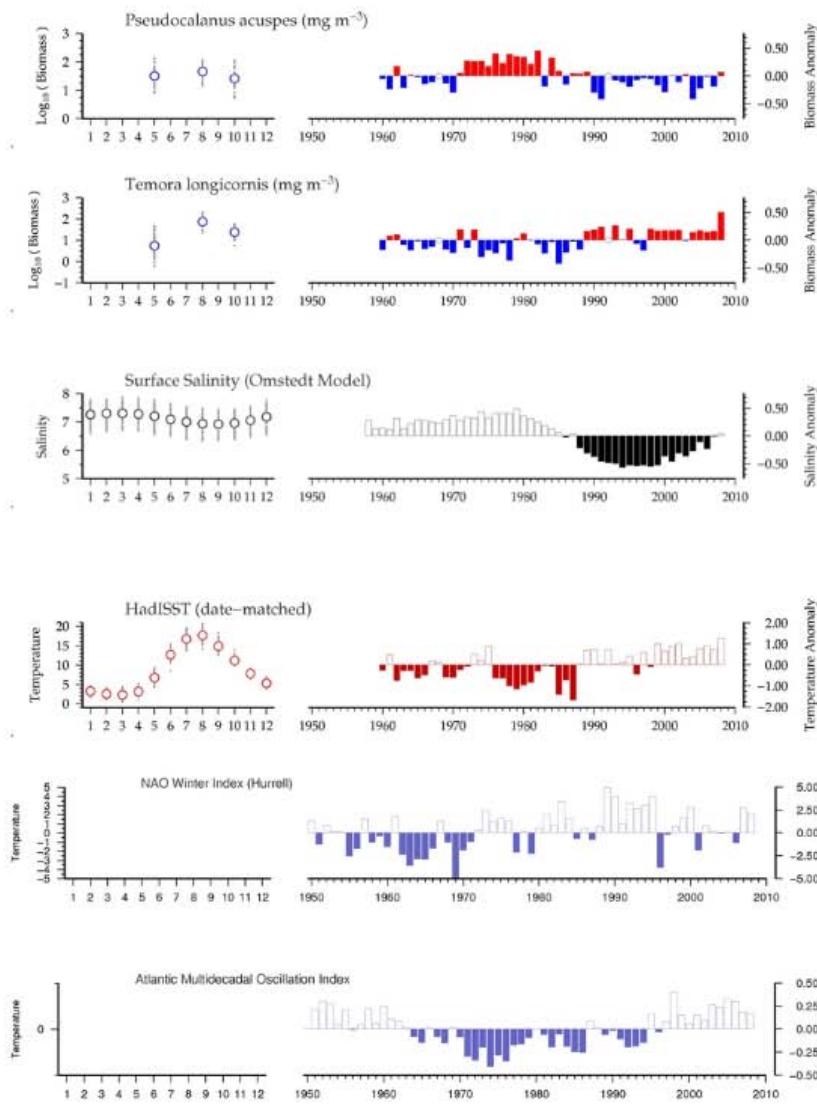


COPEPOD Interactive Time-series Explorer

Select the variables to plot

- Total Zooplankton Wet Mass (mg m⁻³)
- Pseudocalanus acurpes (mg m⁻³)
- Temora longicornis (mg m⁻³)
- Surface Salinity (Omstedt Model)
- Bottom Salinity (Omstedt Model)
- localGloWCHL1 (mg m⁻³)
- HadISST (date-matched)
- HadISST (1950-2000)
- HadISST (1900-2000)
- NAO Winter Index
- Atlantic Multidecadal Oscillation Index
- Arctic Oscillation Index

To see correlation plots (right column below), mouse-over the link to see a mini image, or click on the link itself to see a full size image.



Variable & Climate Correlations:

- [\[X\] \[Y\] se g HadISST \(1900-2000\)](#)
- [\[X\] \[Y\] se g HadISST \(1950-2000\)](#)
- [\[X\] \[Y\] se g HadISST \(date-matched\)](#)
- [\[X\] \[Y\] POB: Surface Salinity \(Omstedt Model\)](#)
- [\[X\] \[Y\] POB: Bottom Salinity \(Omstedt Model\)](#)
- [\[X\] \[Y\] HEG: Atlantic Multidecadal Oscillation](#)
- Order: [Full Variable Comparison Page](#)

Variable & Climate Correlations:

- [\[X\] \[Y\] POB: HadISST \(1900-2000\)](#)
- [\[X\] \[Y\] POB: HadISST \(1950-2000\)](#)
- [\[X\] \[Y\] POB: HadISST \(date-matched\)](#)
- [\[X\] \[Y\] POB: Total Zooplankton Wet Mass \(mg m⁻³\)](#)
- [\[X\] \[Y\] HEG: Surface Salinity \(Omstedt Model\)](#)
- [\[X\] \[Y\] se g NAO Winter Index Hurrell](#)
- [\[X\] \[Y\] POB: Atlantic Multidecadal Oscillation](#)
- [\[X\] \[Y\] se g arctic-oscillation](#)
- Order: [Full Variable Comparison Page](#)

Variable & Climate Correlations:

- [\[X\] \[Y\] HEG: HadISST \(1900-2000\)](#)
- [\[X\] \[Y\] HEG: HadISST \(1950-2000\)](#)
- [\[X\] \[Y\] HEG: HadISST \(date-matched\)](#)
- [\[X\] \[Y\] POB: Pseudocalanus acurpes \(mg m⁻³\)](#)
- [\[X\] \[Y\] HEG: Temora longicornis \(mg m⁻³\)](#)
- [\[X\] \[Y\] POB: Bottom Salinity \(Omstedt Model\)](#)
- [\[X\] \[Y\] se g localGloWCHL1 \(mg m⁻³\)](#)
- [\[X\] \[Y\] se g NAO Winter Index Hurrell](#)
- [\[X\] \[Y\] HEG: Atlantic Multidecadal Oscillation](#)
- [\[X\] \[Y\] HEG: arctic-oscillation](#)
- Order: [Full Variable Comparison Page](#)

Variable & Climate Correlations:

- [\[X\] \[Y\] POB: Total Zooplankton Wet Mass \(mg m⁻³\)](#)
- [\[X\] \[Y\] se g Pseudocalanus acurpes \(mg m⁻³\)](#)
- [\[X\] \[Y\] POB: Temora longicornis \(mg m⁻³\)](#)
- [\[X\] \[Y\] HEG: Surface Salinity \(Omstedt Model\)](#)
- [\[X\] \[Y\] POB: NAO Winter Index Hurrell](#)
- [\[X\] \[Y\] se g Atlantic Multidecadal Oscillation](#)
- [\[X\] \[Y\] POB: arctic-oscillation](#)
- Order: [Full Variable Comparison Page](#)

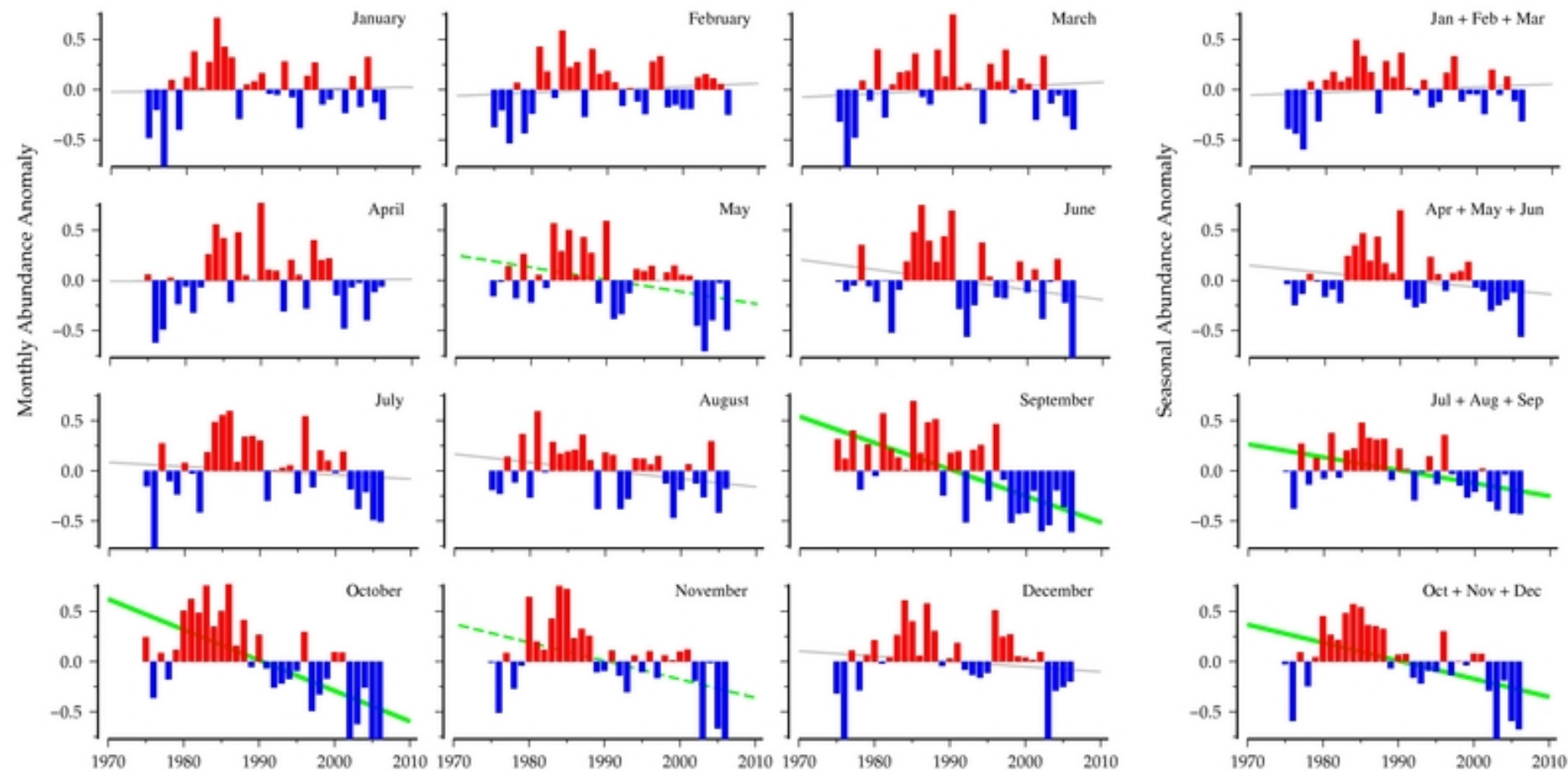
Variable & Climate Correlations:

- [\[X\] \[Y\] POB: HadISST \(1900-2000\)](#)
- [\[X\] \[Y\] POB: HadISST \(1950-2000\)](#)
- [\[X\] \[Y\] POB: HadISST \(date-matched\)](#)
- [\[X\] \[Y\] POB: Total Zooplankton Wet Mass \(mg m⁻³\)](#)
- [\[X\] \[Y\] se g Temora longicornis \(mg m⁻³\)](#)
- [\[X\] \[Y\] se g Surface Salinity \(Omstedt Model\)](#)
- [\[X\] \[Y\] se g Bottom Salinity \(Omstedt Model\)](#)
- Order: [Full Climate Indices Comparison Page](#)

Variable & Climate Correlations:

- [\[X\] \[Y\] se g HadISST \(1900-2000\)](#)
- [\[X\] \[Y\] se g HadISST \(date-matched\)](#)
- [\[X\] \[Y\] HEG: Pseudocalanus acurpes \(mg m⁻³\)](#)
- [\[X\] \[Y\] POB: Temora longicornis \(mg m⁻³\)](#)
- [\[X\] \[Y\] HEG: Surface Salinity \(Omstedt Model\)](#)
- Order: [Full Climate Indices Comparison Page](#)

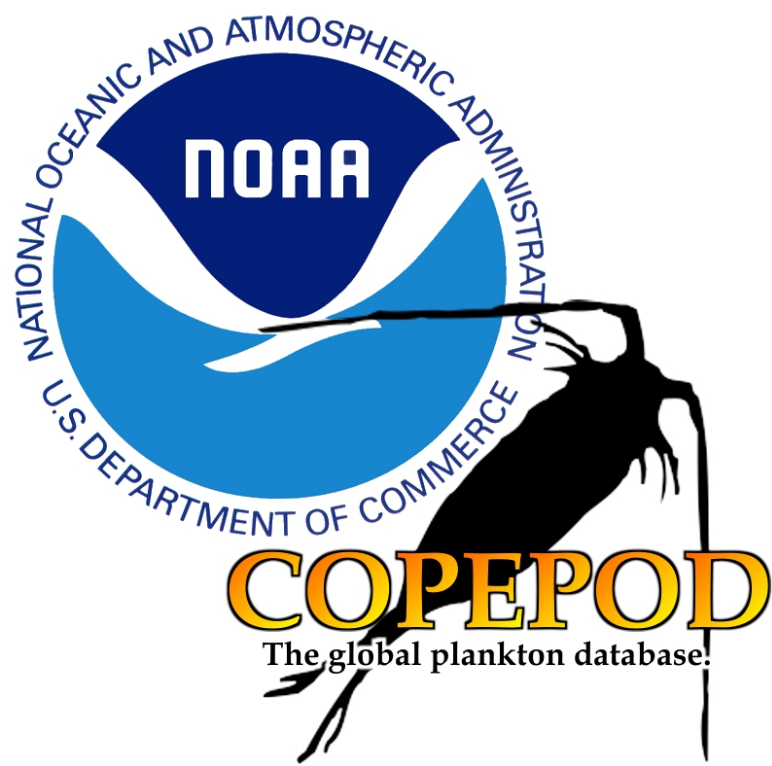
Data: Georgs Kornilovs
Solvita Strake



Small Copepod Abundance ($N m^{-3}$)

Helgoland Roads (Southeast North Sea)

Data: Maarten Boersma,
Jasmin Renz



COPEPOD Life History:

<http://copepod.org>

since March 2004

<http://copepodite.org>

April 1st, 2011

<http://nauplius.org>

Coming fall of 2011