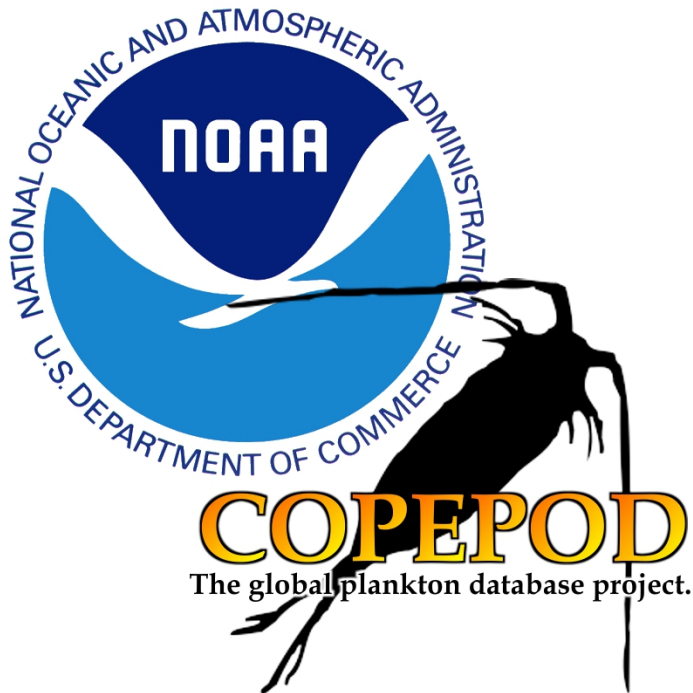


International (group) efforts in Marine Ecological Time Series research

Todd D. O'Brien
COPEPOD Project
NOAA Fisheries



in collaboration with
ICES WGZE / WGPME,
SCOR WG125 / WG137,
and IGMETS (*the other acronym*)

The 3rd International Zooplankton Production Symposium

Gijon, Spain 2003



Symposium Theme: *The role of zooplankton in global ecosystem dynamics:
Comparative studies from the world oceans*

The 3rd International Zooplankton Production Symposium

Gijon, Spain 2003

- Session S3 (Sugimoto & Verheye):
 - *Climate influences: What are long-term zooplankton data sets telling us?*
- Workshop W3 (Perry & Batchelder):
 - *Climate variability, zooplankton abundance and distribution - comparative opportunities from the world's oceans*

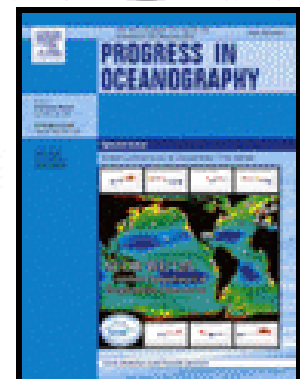
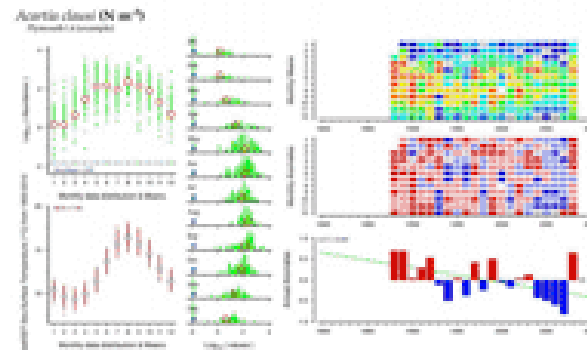
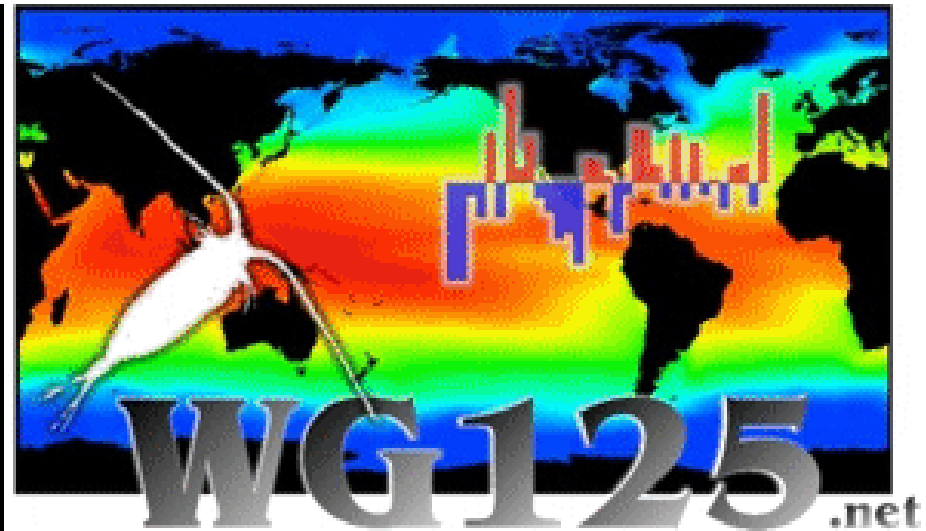
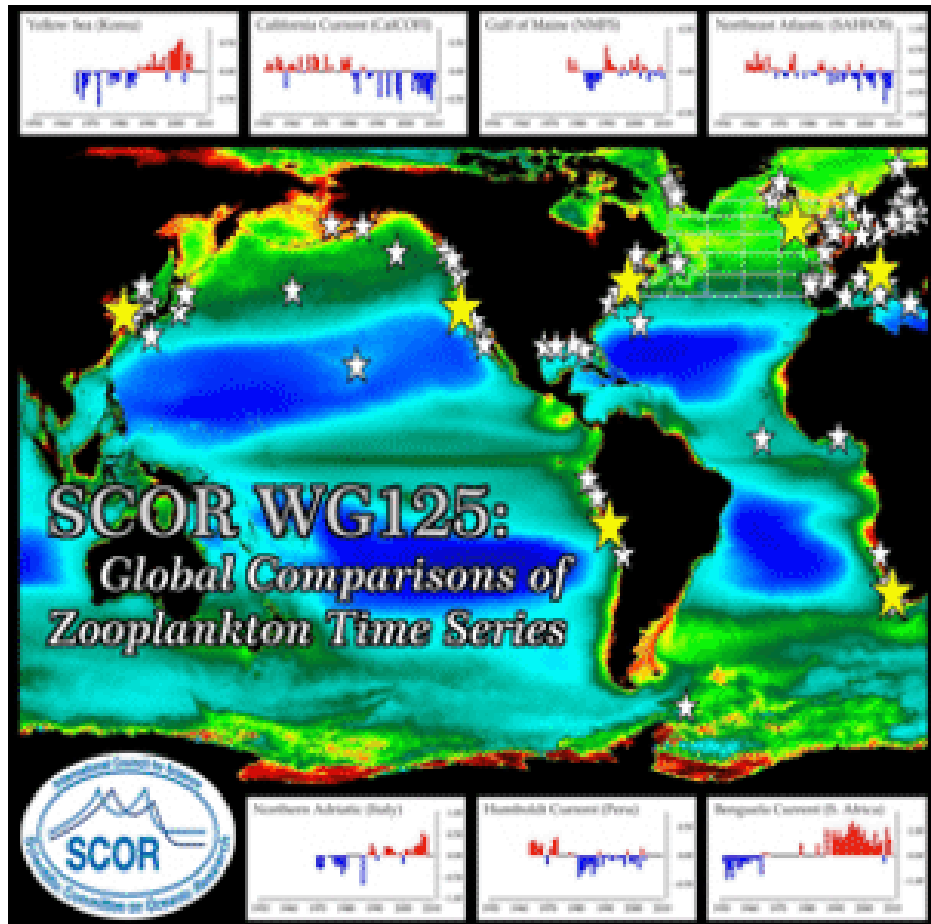
The 3rd International Zooplankton Production Symposium

Gijon, Spain 2003

- Perry *et al.* 2004 (ICES J Mar Sci):
 - *Identifying global synchronies in marine zooplankton populations: issues and opportunities*
- “... need for an easily understood example of global synchrony in zooplankton populations and the relation of those signals to large-scale climate drivers ...”
- “... a common set of statistical and visualization methods should be developed and made widely available ...”

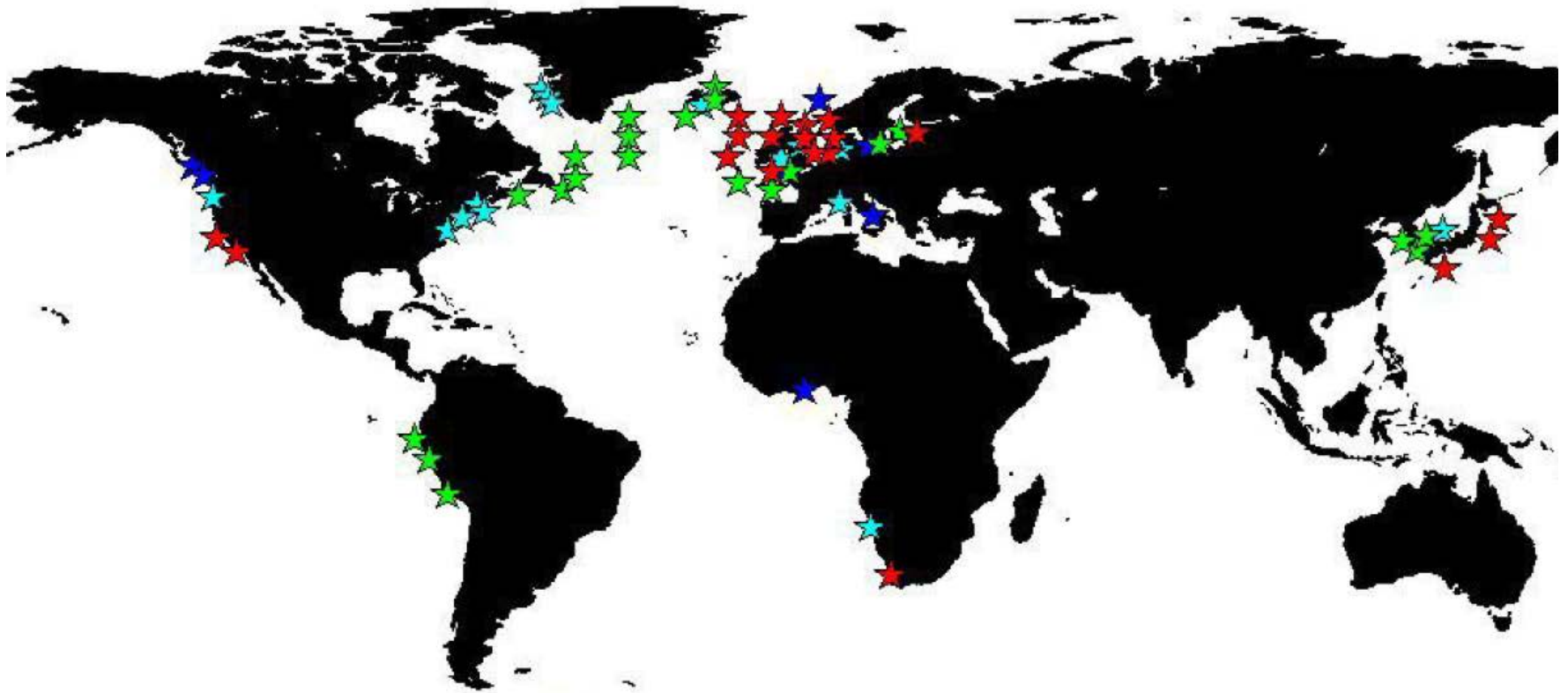


SCOR WG125: Global comparisons of zooplankton time series



<http://WG125.net>

SCOR WG125: Global comparisons of zooplankton time series

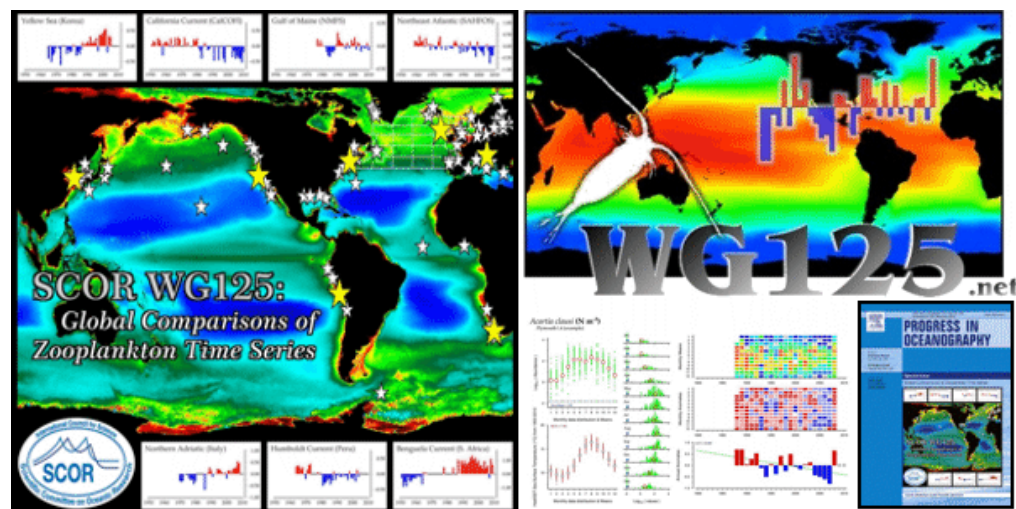


Durations (years): **>50** **>40** **>30** **>20**

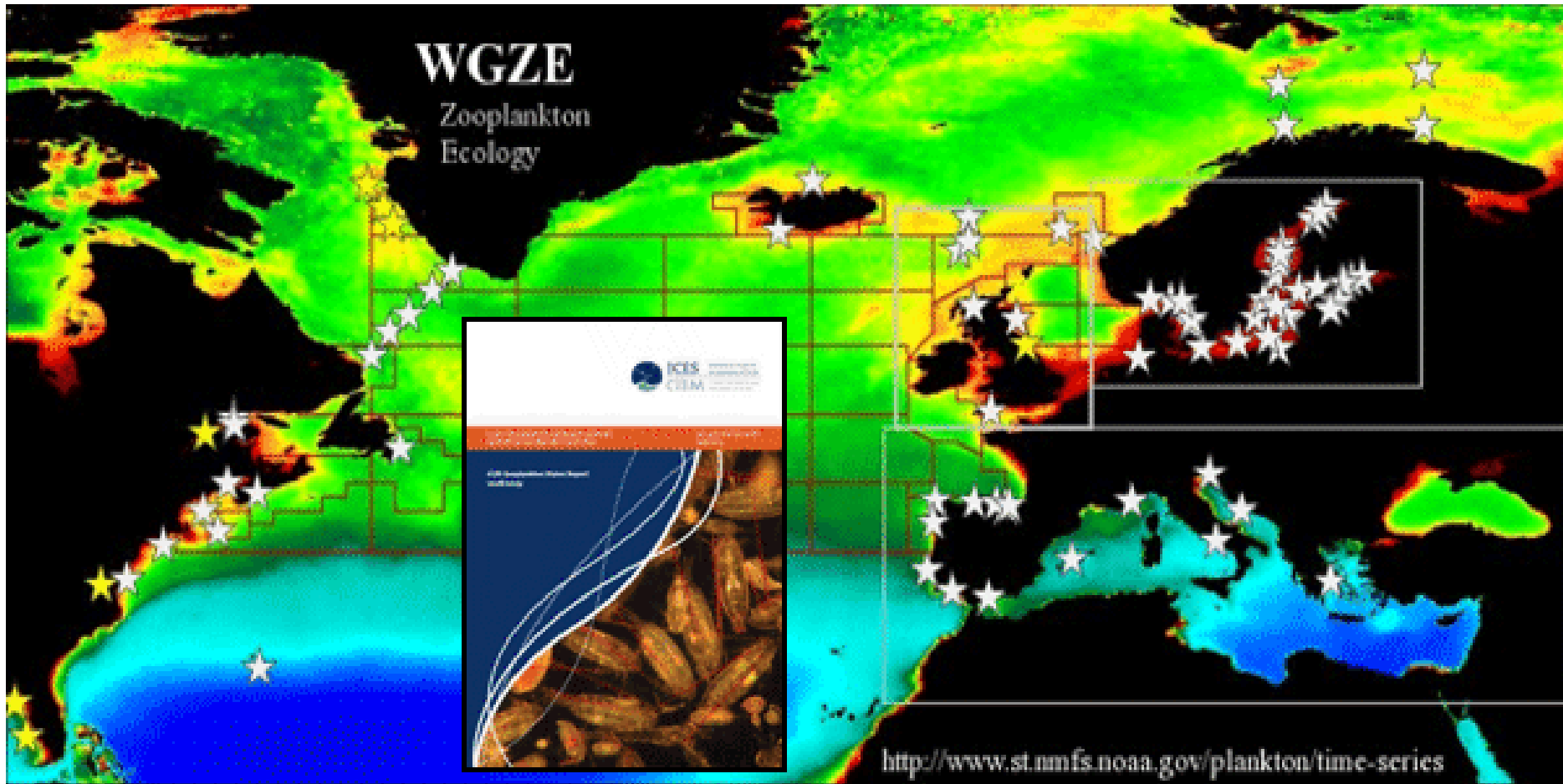
- Co-assembled a collection of ~125 time series (from 23 countries)
- Most of the longest time series were “total biomass”

SCOR WG125: Global comparisons of zooplankton time series

- ZPS-4 (Hiroshima, Japan, 2007):
 - WG125 Presented in-progress results (S1)
- ZPS-5 (Pucon, Chile, 2011):
 - WG125 presented near-final results (W3)
- Special Issue (Prog Oceaogr) 2012
- Working group has ended*.



ICES WGZE: Working Group on Zooplankton Ecology



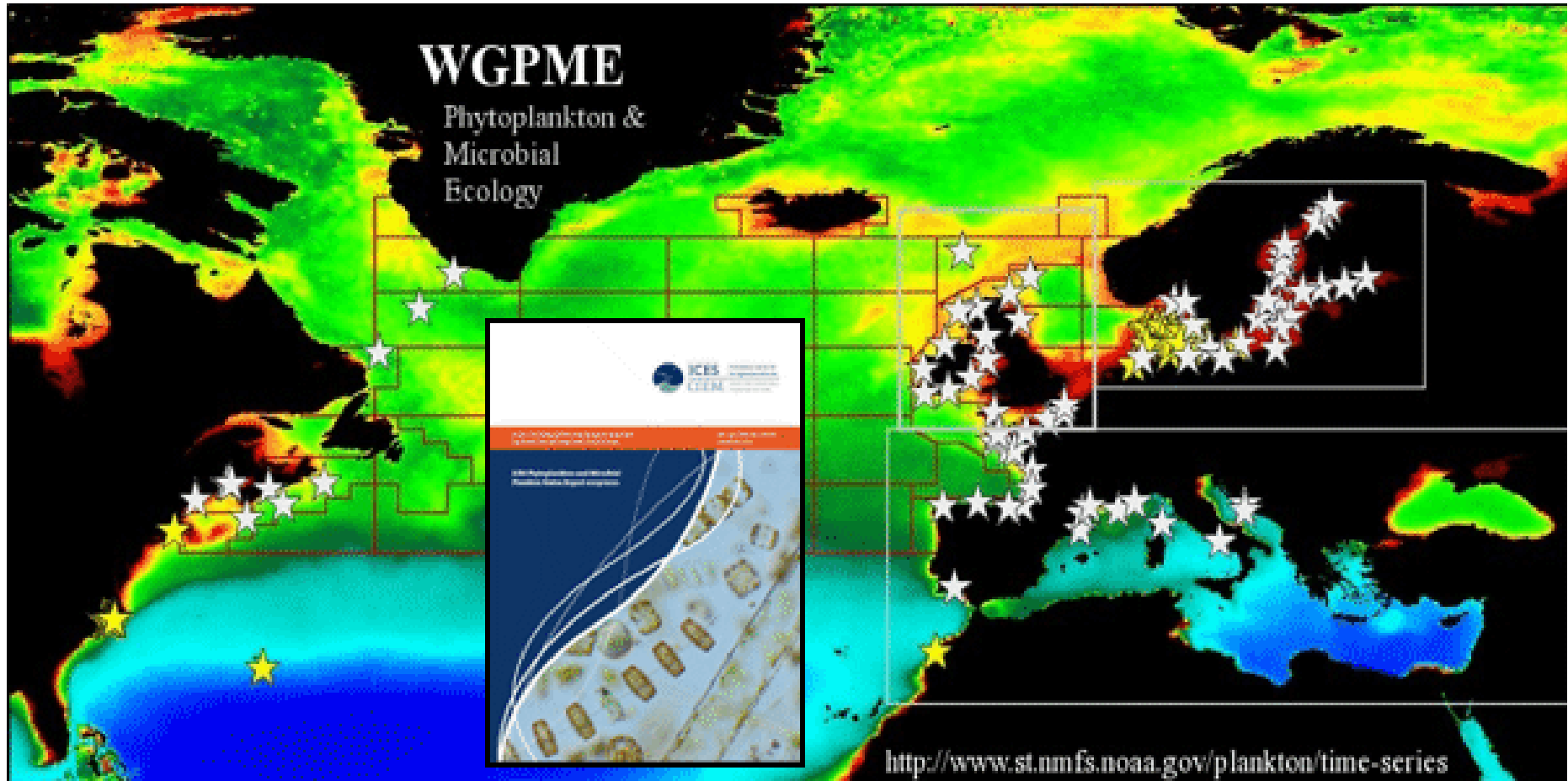
<http://WGZE.net>

ICES WGZE: Working Group on Zooplankton Ecology

- Focuses on the North Atlantic (ICES) regions, and includes the Mediterranean Sea (*after joint WKZEM workshop*)
- WGZE existed LONG before WG125, but the latter introduced standard analyses and visualizations to WGZE
- WGZE's simple end-of-report annex became an official ICES Cooperative Research Report publication.
- Produced every 2-4 years.
- *Next report planned for Spring 2017.*

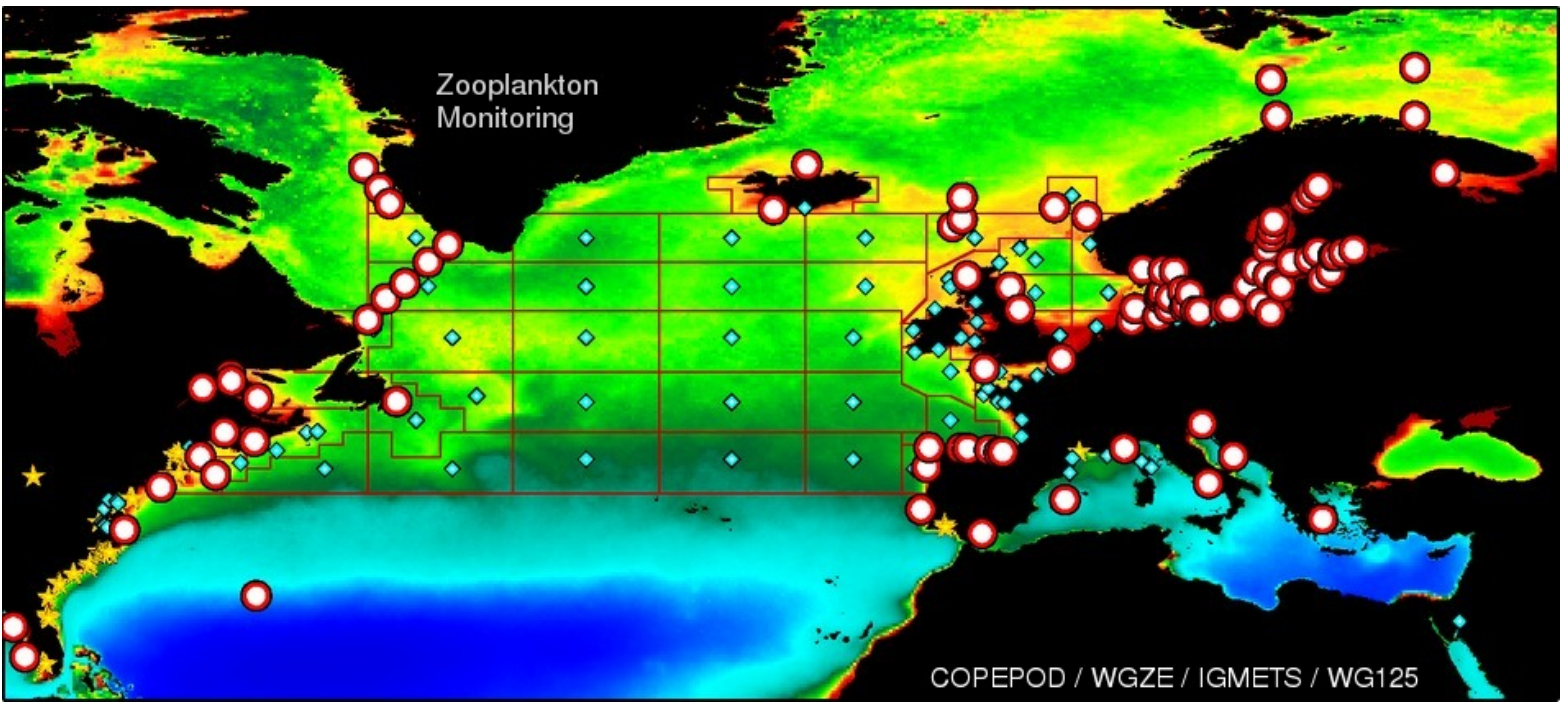


ICES WGPME: Working Group on Phytoplankton & Microbial Ecology

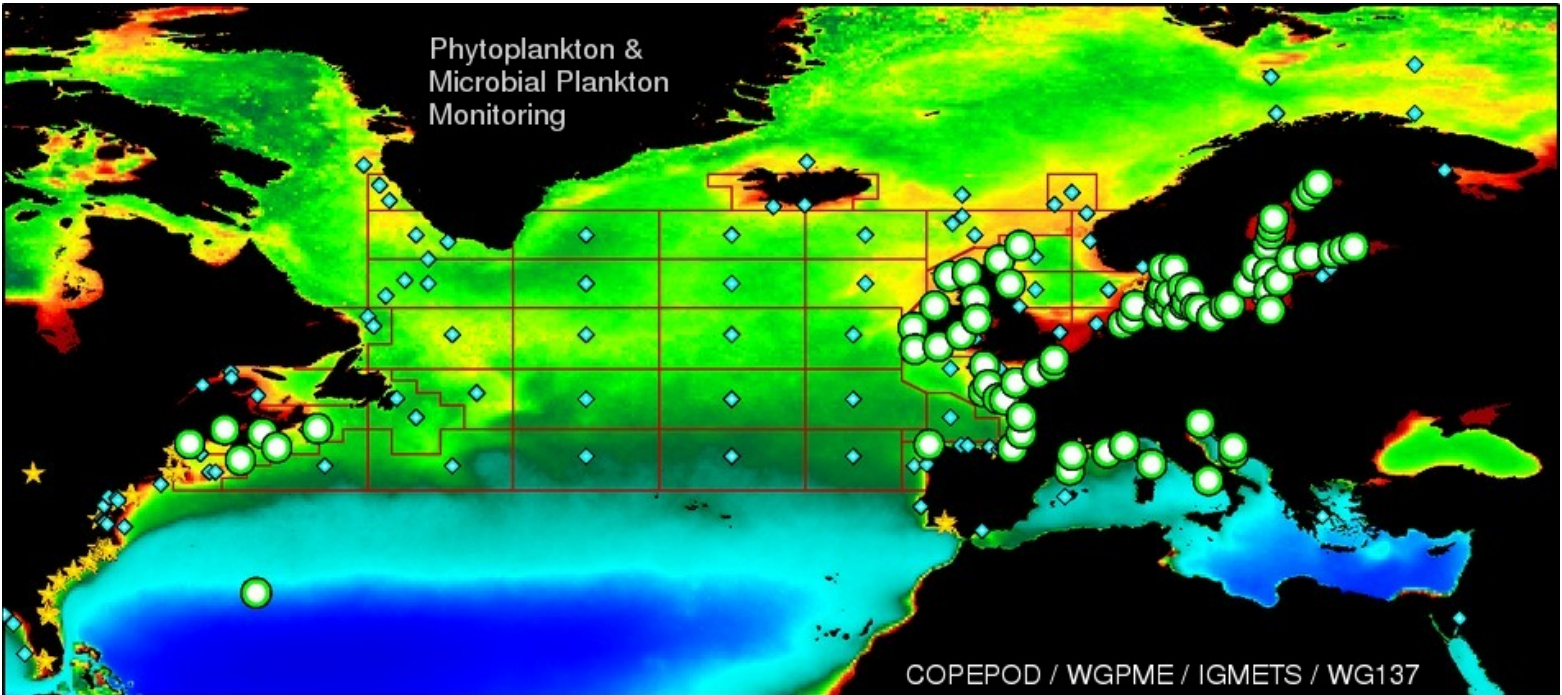


<http://WGPME.net>

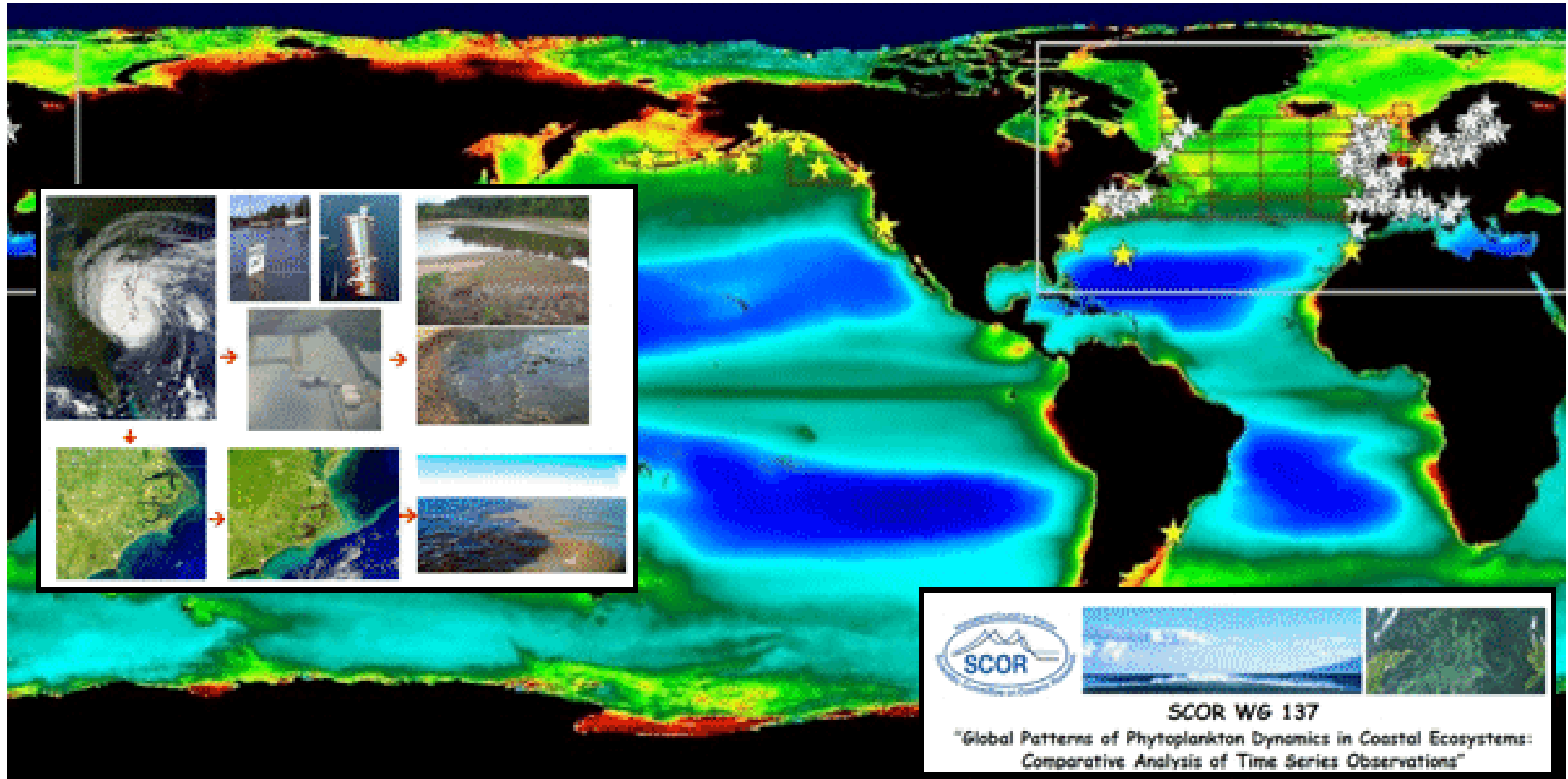
ZOOP



PHYTO



WG137: Global patterns of phytoplankton dynamics in coastal ecosystems



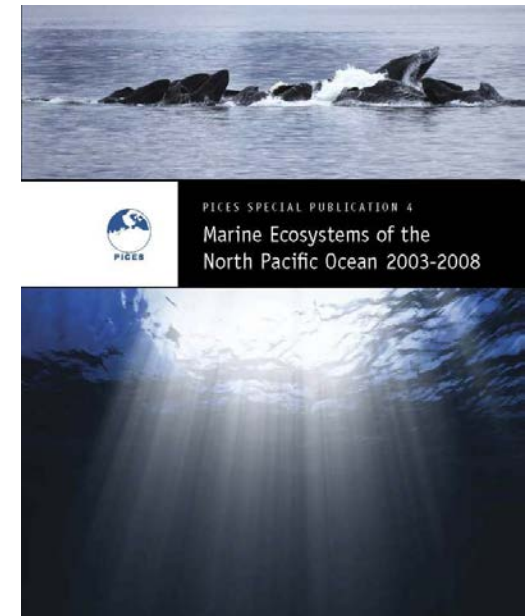
Rebirth: *IOC Group of Experts on Climate Change and Global Trends of Phytoplankton in the Oceans*

<http://WG137.net>

PICES: North Pacific Ecosystem Status Reports (NPESR)

- Not really a continuing “working group”
 - appears to be rebuilt for each report then disbanded
- Divides North Pacific into 10+ NP ecosystems
- Includes more than plankton
- Every Six Years:
 - 2004: 1st publication
 - 2010: 2nd publication
 - 2016: (Planning 3rd)

<https://www.pices.int/projects/npesr/>



International (group) efforts in Marine Ecological Time Series research



... the other acronym ...

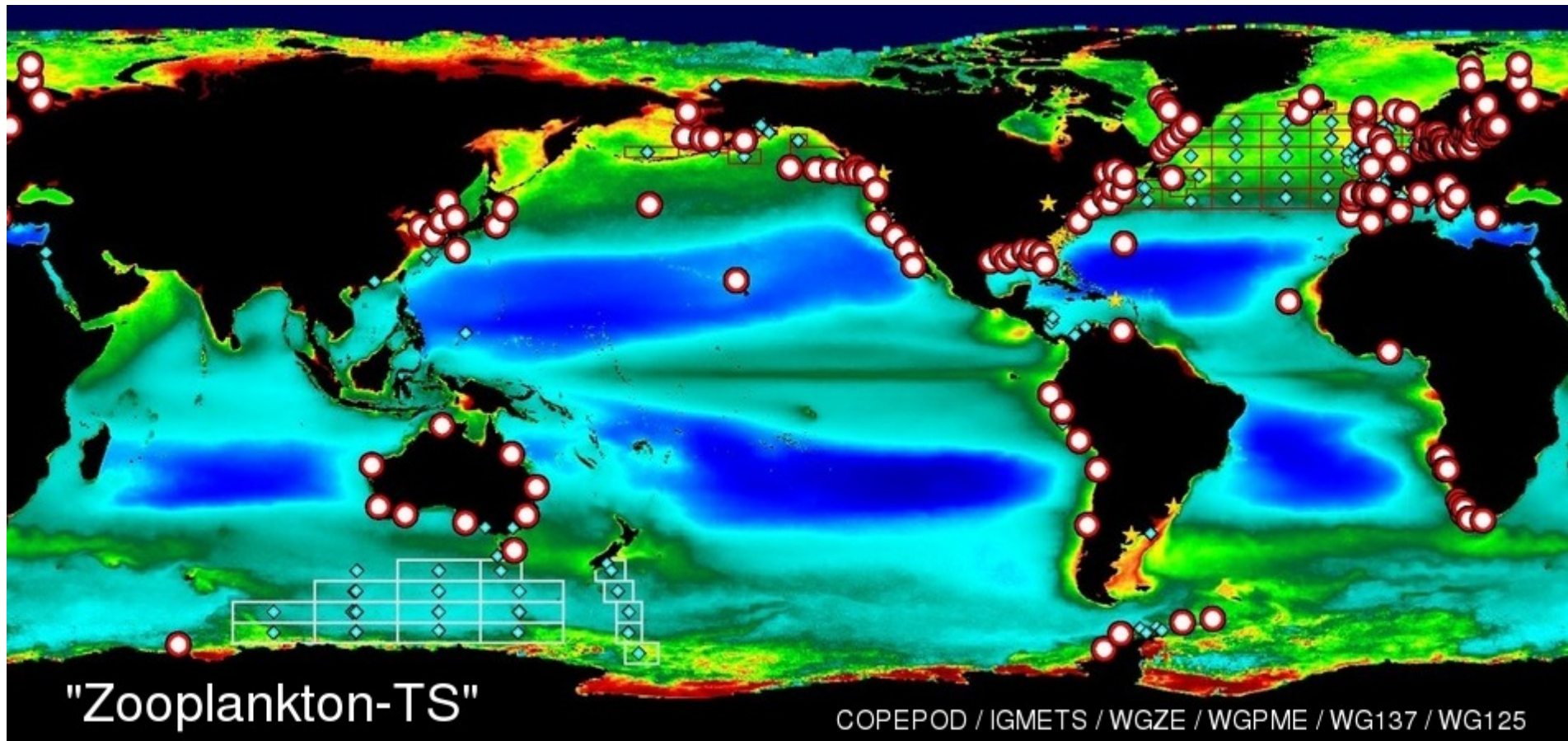
IGMETS: International Group for Marine Ecological Time Series

- An IOC/UNESCO group focusing on “*ship-based in situ biogeochemical and plankton time series*”*
- Co-assembled over 350 time series
 - includes WGZE/WGPME/SCOR co-participants
- Introductory report coming out later this summer
- This will be an ongoing effort.

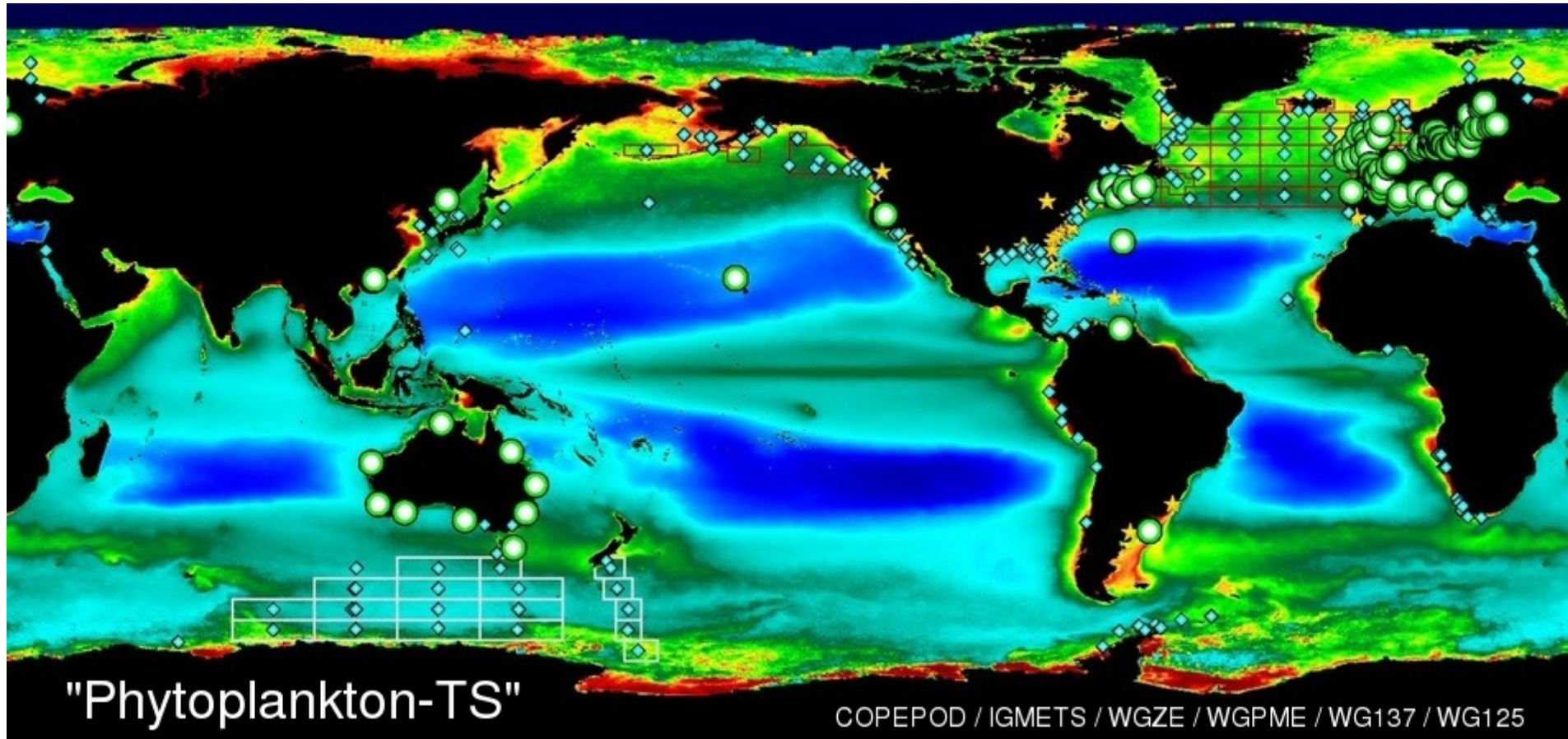


<http://IGMETS.net>

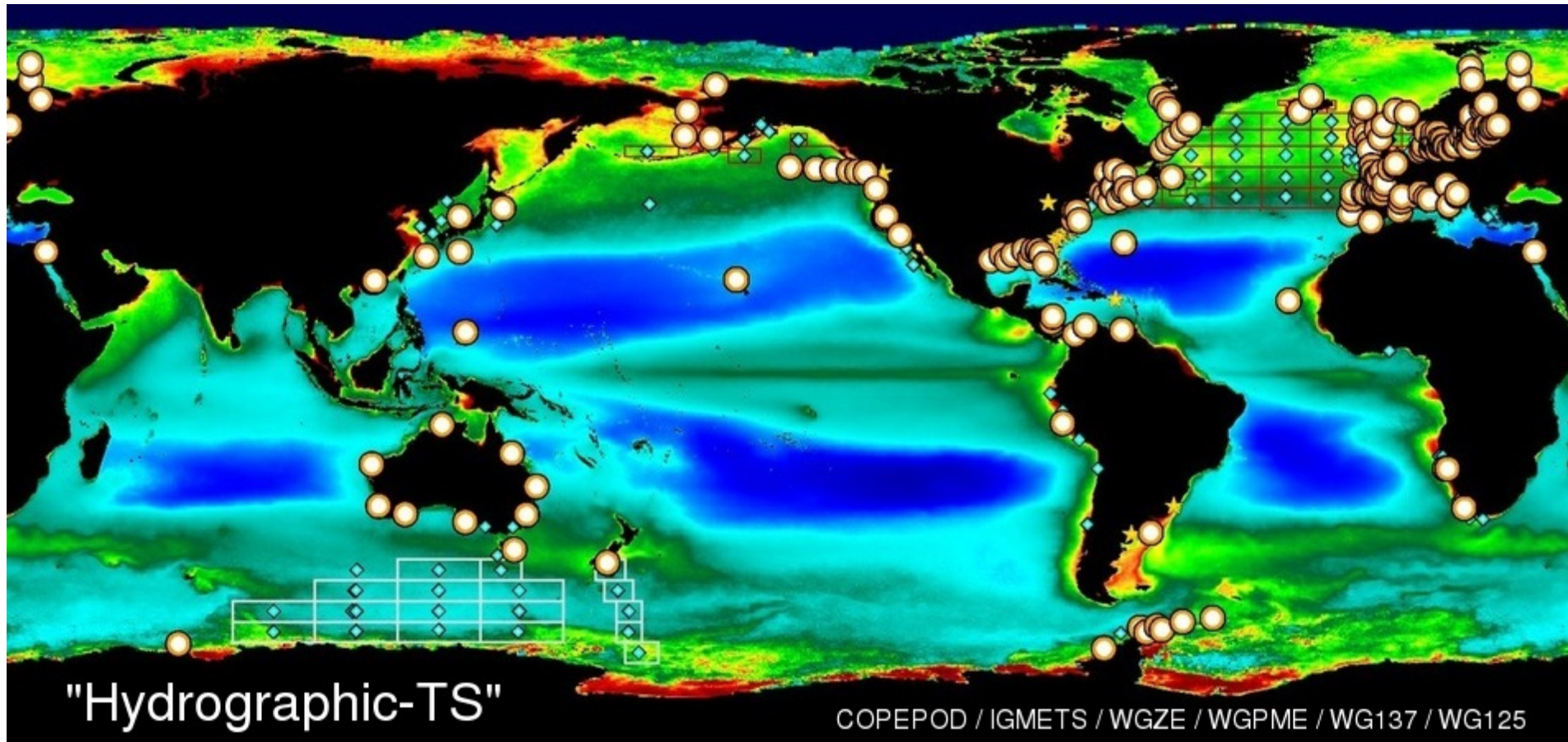
IGMETS: International Group for Marine Ecological Time Series



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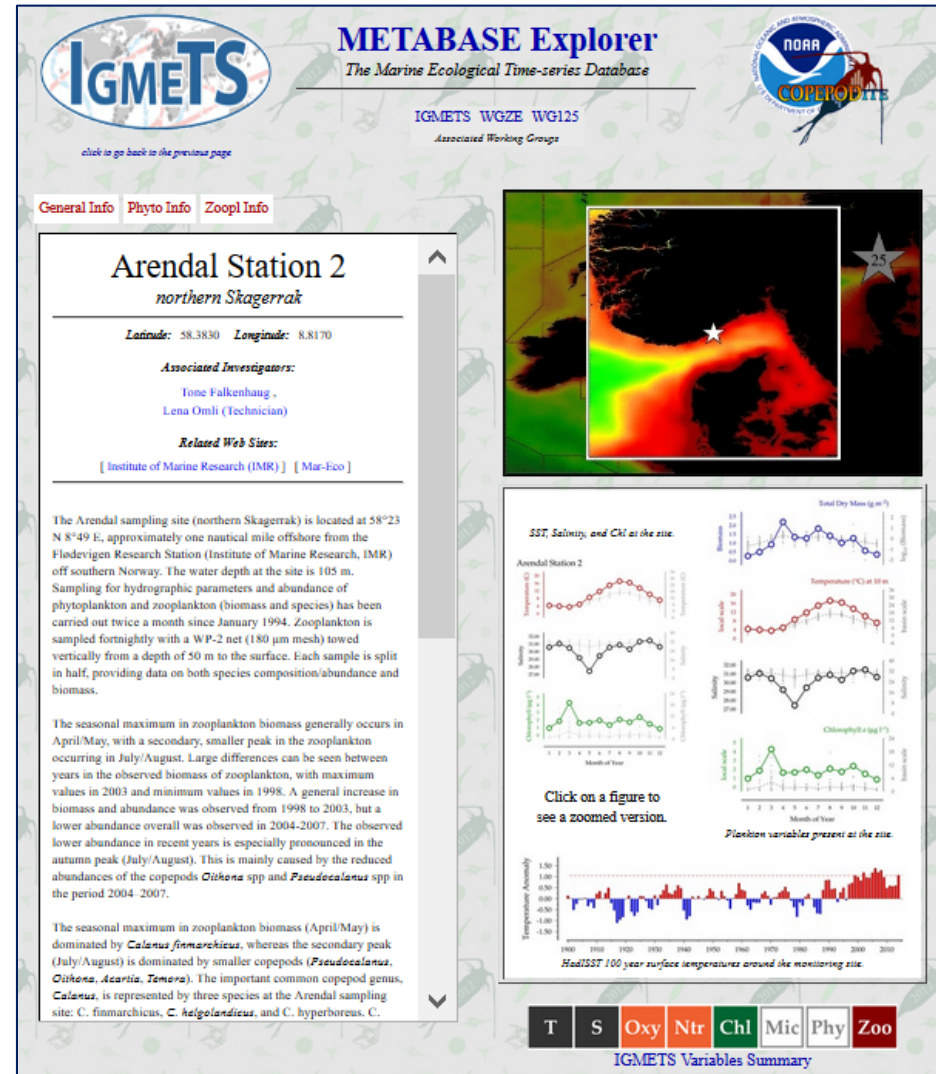


IGMETS: International Group for Marine Ecological Time Series



Multi-group Time Series Metabase

- A “metabase” provides info but not raw data.
 - Data are used for each group’s report analyses only (not released to public).
 - Data access/collaboration remains with original investigators
- Every site has an online summary that shows:
 - Geographic location
 - Variables and time spans
 - Links to contact person(s) and topic and email
 - Links to project web sites



IGMETS Time Series Explorer



The International Group for
Marine Ecological Time Series

Version: 2016-Feb (P)

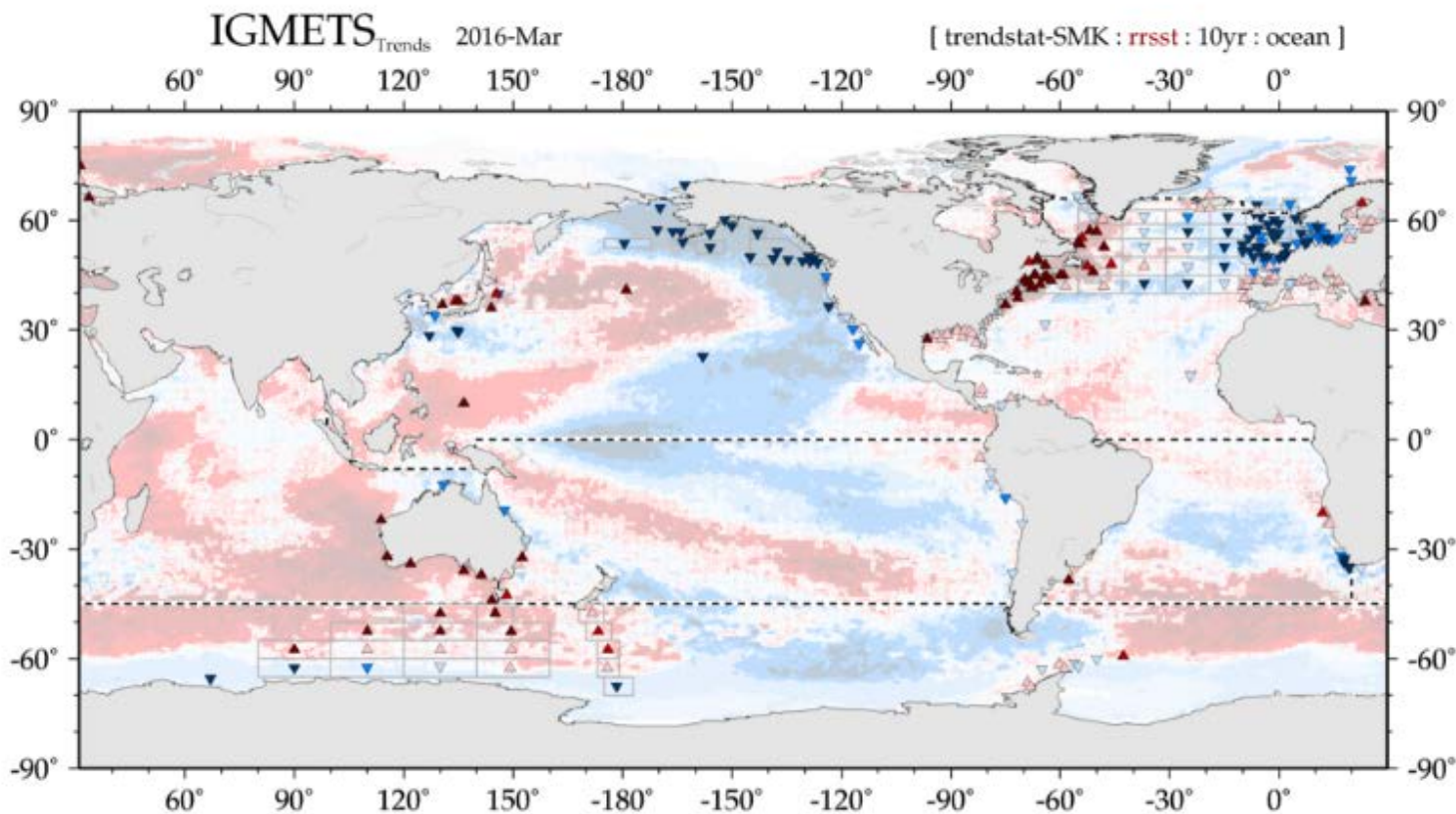
See legend below main map.

Active TIME WINDOW
10 year (2003-2012)

[World | Arctic | ATL-all [N | S] | Southern | Indian | PAC-all [N | S]] [RESET]

Symbol Layer: Choose a variable below ○ No Symbols (turn off symbol layer)			Time Windows & Oceanic Realms		Background Fields				
Hydrography	Chemistry / Carbon		Biology		TWin	Realm	Select a Background	BackFade	
Temp	Tr	Ct Cc Ci	N-NO3	Tr	Ct Cc Ci	<input type="radio"/> 05yr	Ocean <input checked="" type="radio"/>	Var	NONE <input type="radio"/>
PSal	<input type="radio"/>	<input type="radio"/>	P-PO4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> 10yr	Estuarine <input type="radio"/>	SST trends	FADED <input type="radio"/>
D-Oxy	<input type="radio"/>	<input type="radio"/>	Si-SiO4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> 15yr	All-TS <input type="radio"/>	CHL trends	LITE <input type="radio"/>
SST(R)	<input type="radio"/>	<input type="radio"/>	CHL(S)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> 20yr			MED <input type="radio"/>
PSAL(H)	<input type="radio"/>	<input type="radio"/>	Chl-a	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> 25yr			DARK <input type="radio"/>
WIND(I)	<input type="radio"/>	<input type="radio"/>	Chl+PCI	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> 30yr			DARK! <input type="radio"/>
								CHL-vs-SST correlations	

Click on a button above to change the region, variable, time window, salinity range, or background image.

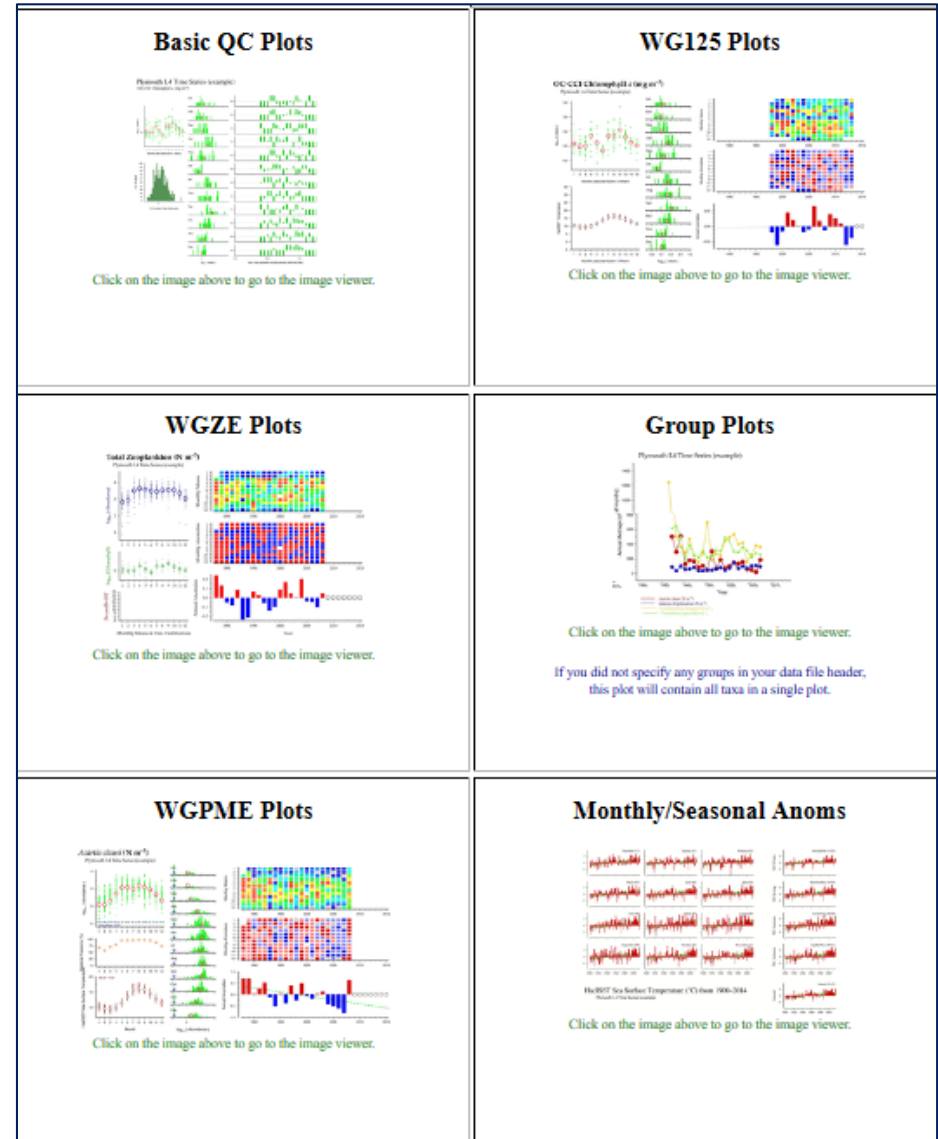


IGMETS 2016-Feb | rrsst-TW10

The Hands-on Time Series Workshop (W6)

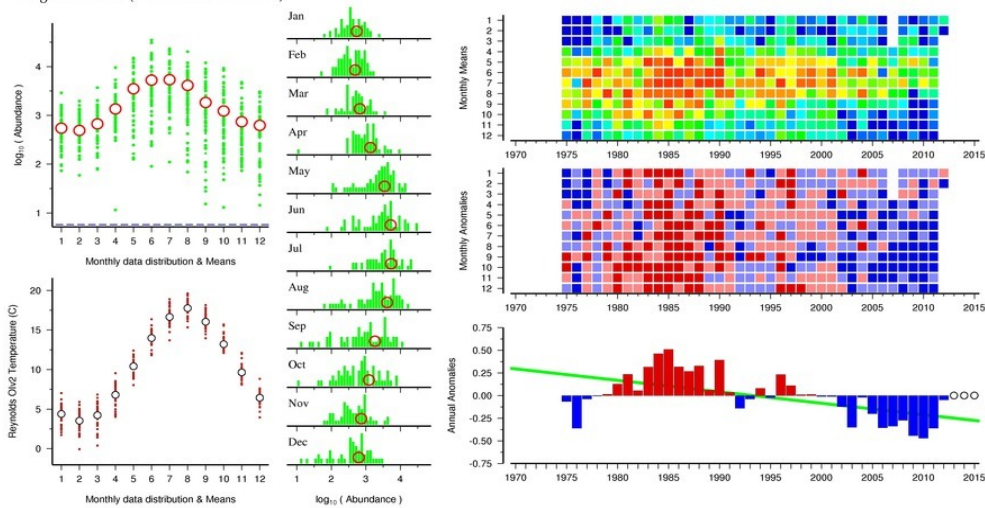
- Many of the analyses developed by these various time series groups are available as part of an online toolkit that will be presented during Workshop W6.

“Exploratory Time Series Analysis & Visualization”



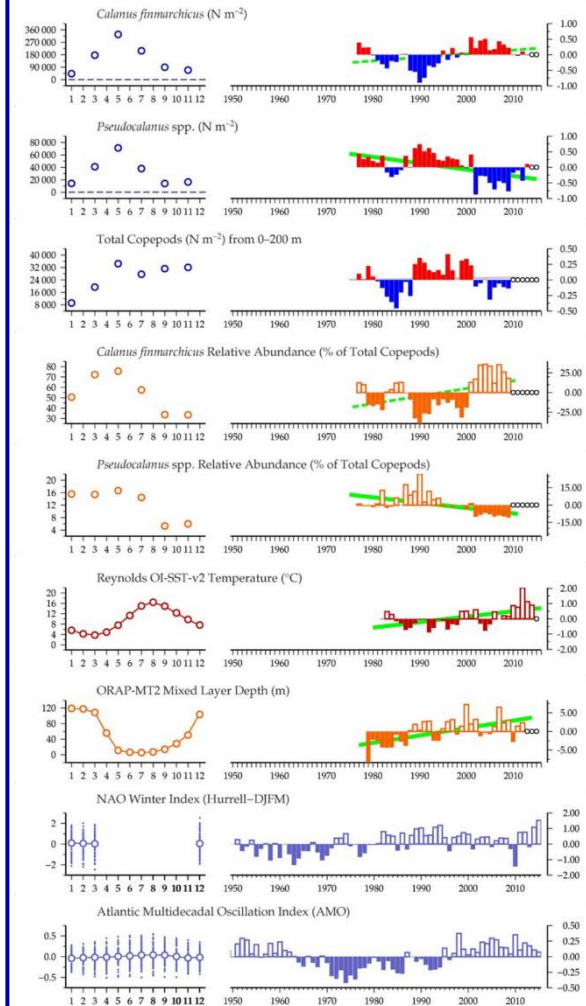
Total Small Copepods ($N m^{-3}$)

Helgoland Roads (southeastern North Sea)



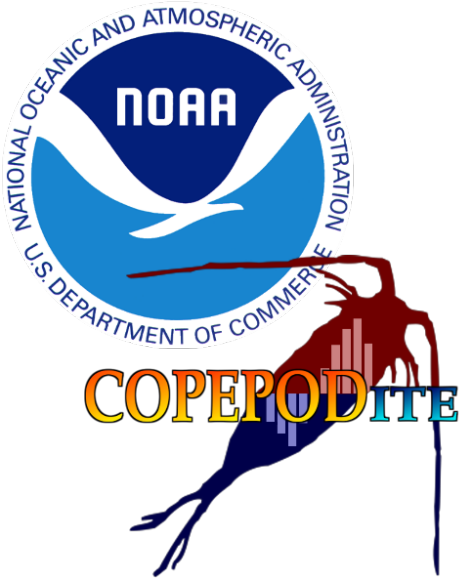
Helgoland Roads

<http://www.st.nmfs.noaa.gov/COPEPOD/time-series/de-30201>

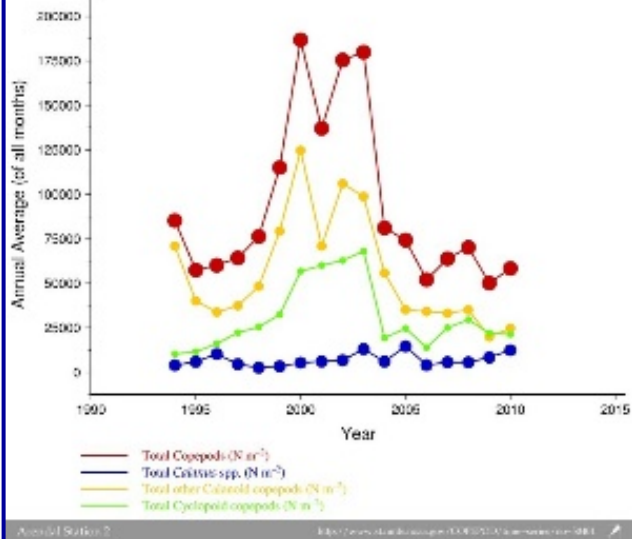


Gulf of Maine

<http://www.st.nmfs.noaa.gov/COPEPOD/time-series/us-70101>



Arendal Station 2 (northern Skagerrak)



— Total Copepods ($N m^{-2}$)
 — Total *Calanus* spp. ($N m^{-2}$)
 — Total other Calanoid copepods ($N m^{-2}$)
 — Total Cyclopoid copepods ($N m^{-2}$)

Arendal Station 2

<http://www.st.nmfs.noaa.gov/COPEPOD/time-series/nl-30101>

Please join these group efforts ...
and tell your non-zooplankton colleagues!

- All-projects Contact Point:
 - Todd.Obrien@noaa.gov
- See also:
 - IGMETS.net
 - WGZE.net
 - WGPME.net
 - COPEPOD.org
 - COPEPODITE.org