



**NOAA
FISHERIES**

July 27, 2016

Ecosystem Science Program Review

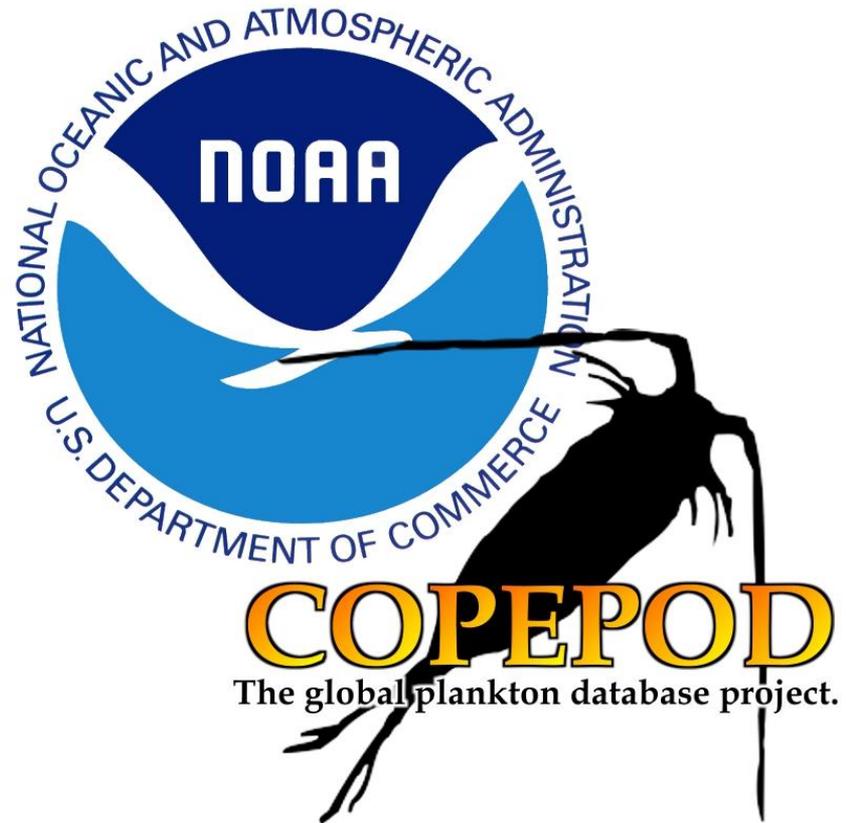
COPEPOD

the global plankton database project

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It's all in the acronym!

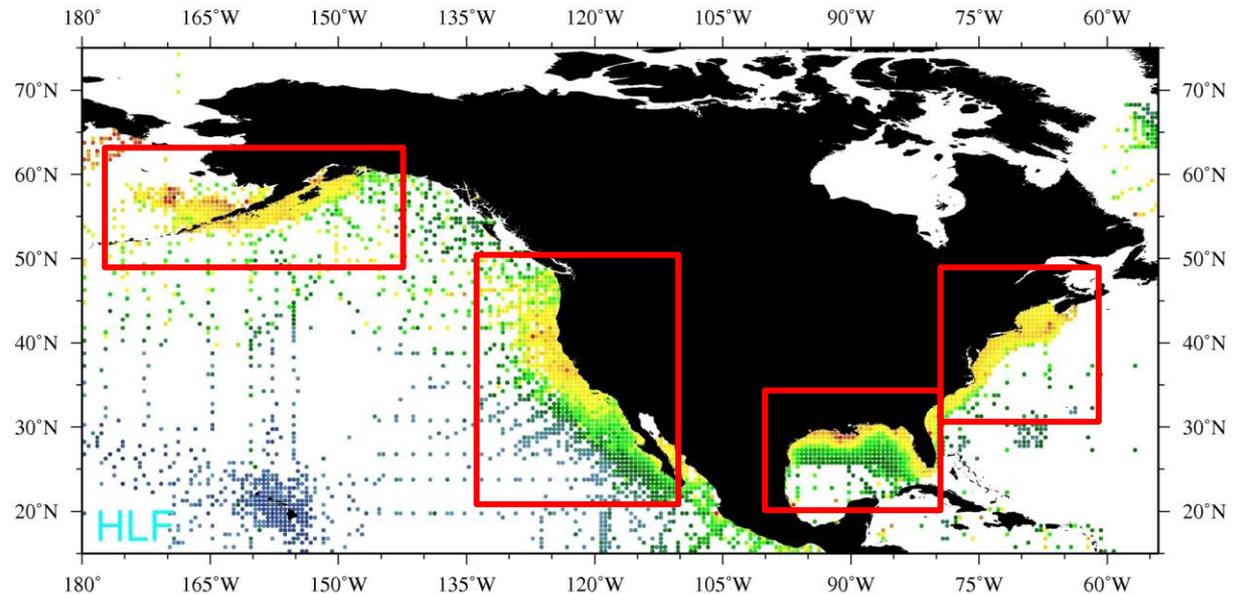
- C oastal &
- O ceanic
- P lankton
- E cology,
- P roduction, &
- O bservation
- D atabase



A NOAA Fisheries legacy ...

- *Coastal &*
- **Oceanic**
- *Plankton*
- **Ecology,**
- **Production, &**
- *Observation*
- *Database*

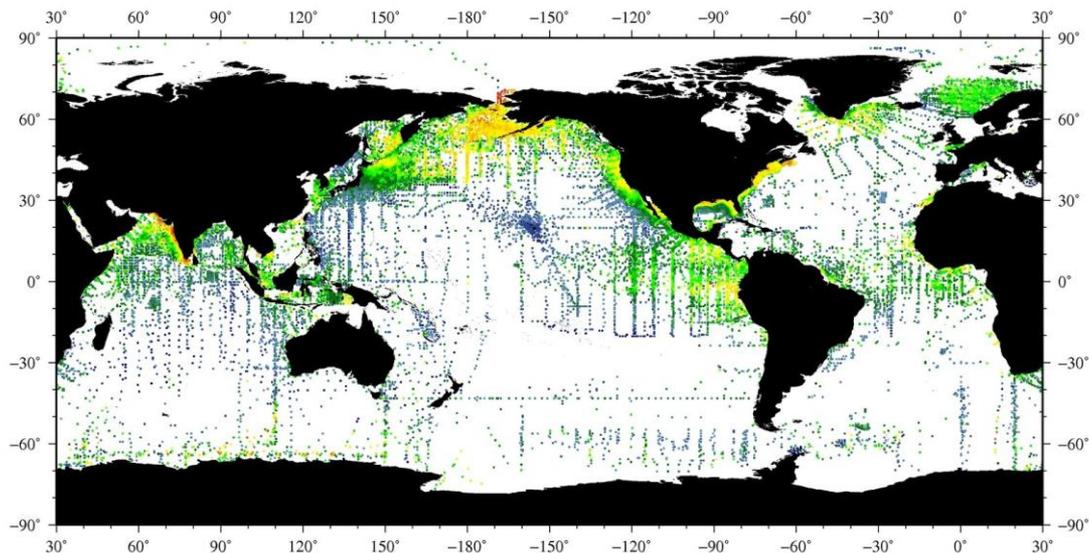
- Originally, over 60% of this database came from 50+ years of NMFS/BCF plankton surveys and programs.



<i>Alaska (EcoFOCI)</i>	<i>1980's</i>
<i>California (CalCOFI)</i>	<i>1950's</i>
<i>Northeast US (EcoMon/MARMAP)</i>	<i>1970's</i>
<i>Gulf of Mexico (SEAMAP)</i>	<i>1980's</i>

... that expanded into a global project ...

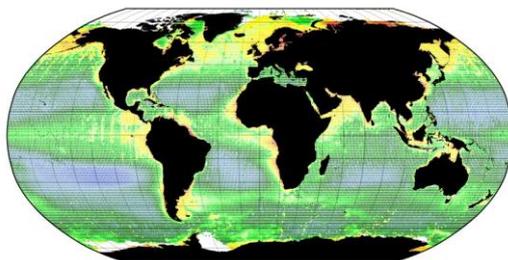
- *Coastal &*
 - *Oceanic*
 - *Plankton*
 - Ecology,
 - Production, &
 - *Observation*
 - *Database*
- Today, this database is a *global* compilation with significant contributions from Russian, Japanese, British, Canadian, and Australian sources.



... and went beyond “just data”.

- Coastal &
- Oceanic
- *Plankton*
- *Ecology,*
- *Production, &*
- *Observation*
- Database

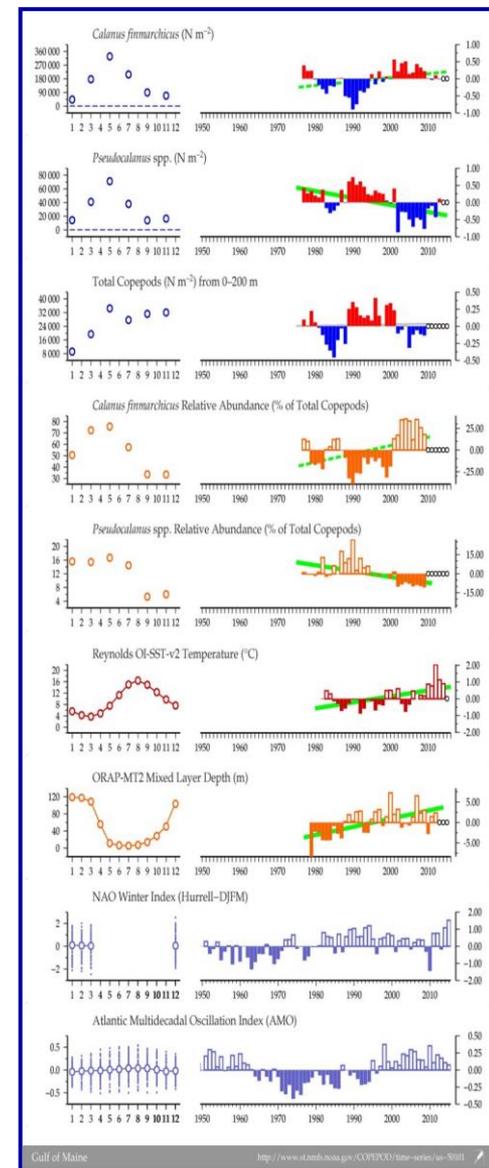
- Time Series Data & Tools
- Spatial Data Products



- Morphological & Biometric Info



Multi-Variable Comparison Plot



COPEPOD is different from other efforts!

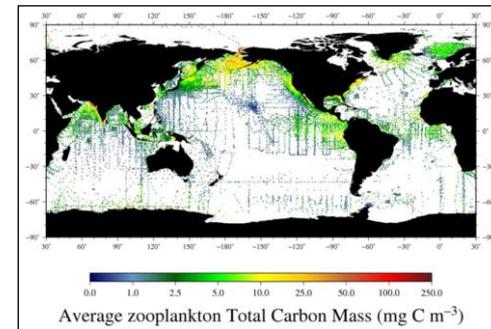
- Building a database “capable of holding plankton data” is a challenge ... but only the first (small) step.
 - Can users and data providers find/Google the data?
 - Can the database use broad terms like “diatoms”?
 - Are the quality and quantity of the data clearly presented?
 - Can the downloaded data be used and applied as-is?

Developed with the community for the community.

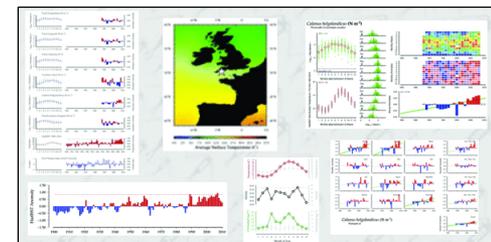
- COPEPOD was built by a plankton data user, while actively working with plankton scientists and projects, to address the needs of the plankton and ecosystems community.
- COPEPOD focuses on keeping the original data identity intact, adding ease-of-use accessibility through indexing and pre-calculated add-on values, and offering that data in a variety of formats, aggregated-sums, and ready-to-use products.

ToR 1: Goals and Objectives

- **Why?** To provide global plankton and ecosystems data, products, and exploration tools for the marine ecosystem and fisheries research communities.
- **What?** A global database of plankton survey data and prepared data products. Online toolkits for the discovery and analysis of time series and the extraction and visualization of *in situ* and satellite oceanographic data.
- **How?** One scientist focused on plankton data compilation and analysis, product development, and collaboration with plankton and ecosystem scientists.



The screenshot shows the COPEPOD (Coastal & Oceanic Plankton Ecology: Production, & Observation Database) website. It features a search bar and three main navigation categories: BY METADATA, BY TAXA, and BY REGION. Under BY METADATA, options include 'by Ship or Cruise', 'by Project', 'by Investigator', 'by Institute', 'by Country', and 'List of ALL Data Sets'. Under BY TAXA, options include 'Zooplankton', 'Phytoplankton', and 'Total Biomass'. Under BY REGION, it lists Major Basins (Atlantic, Pacific, Indian, Arctic, Antarctic) and Minor Basins (Gulf of Mexico, Mediterranean, Baltic, Indonesian). The footer includes NOAA logos and contact information.



ToR 2: Integration and Interaction

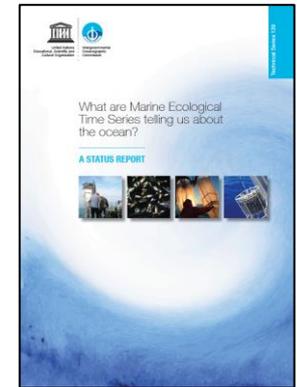
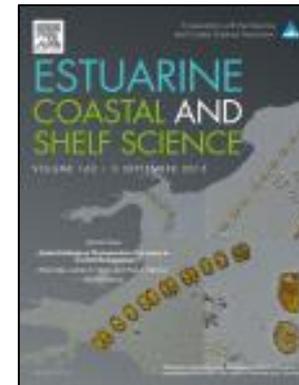
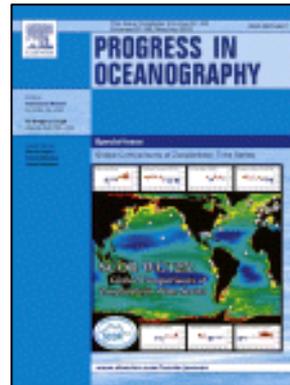
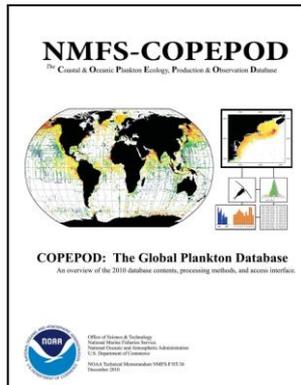
- **NMFS Science Centers:**
 - Historically, interactions have been only with the zooplankton scientists
 - More recently interactions expanded into ichthyoplankton (thanks to FATE)
- **NOAA (non-NMFS):**
 - GFDL (Charlie Stock), NODC, NERRS, *OOS
- **U.S. (non-NOAA):**
 - USGCRP, US-RON, BCO-DMO, EarthCube
 - Universities (students and researchers) and Institutions (WHOI, Scripps)
 - NGOs (The Wild Dolphin Project)
- **International:**
 - Working Groups: ICES, PICES, SCOR, IOC-UNESCO
 - Projects: IMBER, CoML/CMarZ, PANGAEA, OBIS, IODE

ToRs 3 & 4: Addressing “NMFS” Needs & Priorities

- Generally the Science Centers focus on and specialize in their assigned regions, while COPEPOD brings together data from multiple Centers, and outside data sources, to create larger oceanic overviews (e.g., the western North Atlantic, the eastern North Pacific). In this way they complement and not compete.
- COPEPOD also brings data together for trans-basin (e.g., North Atlantic, North Pacific) as well as global studies that are beyond the immediate scope of the Science Centers, yet may have local impacts (e.g., the northward shift of species, gelatinous blooms, invasive species).

ToR 5: Communication

- COPEPOD has a rich web presence and a strong Google footprint.
- Data and products from COPEPOD/NMFS have participated in North Atlantic (ICES), North Pacific (PICES), and global (SCOR, IGMETS) studies, status reports, peer-review publications, and Tech Memos.



Challenges and Possible Solutions

<i>Challenges</i>	<i>Possible Solutions</i>
<p>COPEPOD is currently a one person effort, attempting to do the work of >1 person. With more time, COPEPOD could work more closely with each of the Science Center's staff/needs.</p>	<p>Additional support?</p>
<p>Better collaboration between COPEPOD and the Science Centers is also hindered by lack of resources (time and people) at the Centers.</p>	<p>FATE awards short-term project money to Science Centers to hire a post-Doc (or similar) to focus-on and tackle key issues.</p>