

Your abstract submission has been received

Click [HERE](#) to print this page now.

You have submitted the following abstract to 2016 Ocean Sciences Meeting.

Receipt of this notice does not guarantee that your submission was accepted for the 2016 Ocean Sciences Meeting. All submissions are subject to review and acceptance by the Program Committee.

You may review or edit your abstract submission until the deadline of 23 September 2015 23:59 EDT/03:59 +1 GMT. After this date, no further edits will be made to the submission.

Increasing biomass in the global and warm oceans? Unexpected new insights from SeaWiFS data: 1997-2010

Irina Marinov, University of Pennsylvania, Philadelphia, PA, United States

Abstract Text:

It is commonly assumed that warming of the nutrient-depleted subtropical gyres intensifies their oligotrophy, as it decreases vertical mixing of the surface and nutrient-rich deep waters, increasing the nutrient limitation of phytoplankton. Previous researchers have claimed expansions of the oligotrophic gyres and decreasing Chlorophyll (Chl) concentrations since the advent of satellite color measurements, purportedly due to climate warming. We review this topic via a reanalysis of Chl and the backscattering-based phytoplankton functional group (PFT) biomass timeseries (Kostadinov et al. 2009, 2010) over the 1997-2010 SeaWiFS period. We find that globally biomass and the percent of large phytoplankton increase while Chl decreases over the 1999-2010 period. The Chl decrease can be ascribed to changes in the Pacific tropical tongue, while the biomass increase is driven by the subtropical gyres. Globally we see a weak reduction in the total size of oligotrophic gyres. We show here that all these tropical and subtropical biological signals - which drive the global biological signals - can be explained to a first order by ENSO-driven physical variability in the Pacific, and are therefore not a signature of climate change.

We find that the 1999-2010 period can be divided into a period with increasing Multivariate El Niño index (MEI) (1999-2002) and a period with decreasing MEI (2002-2010). The trends in tropical/subtropical Chl, biomass and oligotrophic gyre sizes over these two periods are opposite and can be ascribed to ENSO-driven trends in stratification and winds. Importantly, these trends almost cancel out, resulting in weak overall trends over the entire SeaWiFS period in both Chl and biomass. We analyze the complex spatial differences in biological variability across the subtropical gyres, the Pacific warm pool and equatorial tongue via EOF and composite analysis for both physical (SST, MLD, winds) and biological (Chl, total biomass, PFT biomass) fields. The interannual variability and the trends in physical and biological fields show clear signatures of the Modoki or Warm Pool El Niño.

Topic Selection: Modeling and observing the physical-biological interactions that organize the spatio-temporal distribution of biomass in marine ecosystems

Title: Increasing biomass in the global and warm oceans? Unexpected new insights from SeaWiFS data: 1997-2010

Submitter's E-mail Address: imarinov@sas.upenn.edu

Preferred Presentation Format: Assigned by Session Chairs/Program Committee (Oral or Poster)

Scheduling Request: Alternative session:AH002: Assessing the Cumulative Effects of Complex Ocean Change on Marine Biota

First Presenting Author

Presenting Author

Irina Marinov

Primary Email: imarinov@sas.upenn.edu

Phone: 6172309923

Affiliation(s):

University of Pennsylvania
Philadelphia PA (United States)

Student? N

If necessary, you can make changes to your abstract submission

- To access your submission in the future, point your browser to: [User Portal](#)
- Your Abstract ID# is: 93010.
- Any changes that you make will be reflected instantly in what is seen by the reviewers.
- After the abstract proposal is submitted, you are not required to go through all submission steps to make edits. For example, click the "Authors" step in the Abstract Submission Control Panel to edit the Authors and then click save or submit.
When you have completed your submission, you may close this browser window or submit another abstract proposal: [Call for Abstracts](#).

[Tell us what you think of the abstract submission process](#)