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NEMO [Chl]

1 message

Robert Frouin <rfrouin@ucsd.edu> Mon, Nov 26, 2012 at 9:46 AM
To: Kyozo Ueyoshi <kueyoshi@gmail.com>

Ahoy Kyozo:

Discussing with you last week about comparisons between NEMO and satellite [Chl], I thought about something interesting to do, which has not been made yet. It is to compare from the NEMO climatology (40-year average) the [Chl] at the surface (or integrated over the first 30 m), ideally over the first optical attenuation depth (what the satellite sees), and the vertically integrated [Chl] over the entire water column. This to show that, in fact, the satellite sees only a small fraction of the total chlorophyll biomass. What would be needed for such a study are:

1. Maps of annual [Chl], global oceans, Satellite and NEMO over the same time period (surface or average over 30 m, or if possible, average over the first attenuation depth. The first attenuation depth, D, can be calculated from the diffuse attenuation coefficient Kd, which depends on [Chl] as: D = 2.3/Kd. What you can do, to simplify, is to calculate D from [Chl] in the first few layers, up to 30 m, and then average the D values. This to show that satellite and NEMO are generally in agreement.

2. Maps of annual [Chl] biomass integrated over D and annual [Chl] biomass integrated over the entire water column (or 200 m, because there is nothing below). Units would be mg/m^2, and map of the ratio.

3. Then we want to see if the two fields are correlated, by simply plotting [Chl] biomass over D versus total [Chl] biomass, eventually distinguishing between different latitudes and oceans.

Another study also of interest, in the same line, would be to study how vertically integrated [Chl] biomass change with climate change (emission scenarios). People say that there will be some changes at the surface, but it's possible that below the surface you have opposite changes, and in the total not much change. That would be very interesting to show.

Regards, Robert.

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