

Referee 2 Observations

Comment

One of the main shortcomings of the paper is that it offers virtually no explanations on why the combination of upwelling with equatorward or upwelling with warm poleward current either enhances or suppresses NPP. For instance, in (Perú-Chile) Humboldt Current system (HCS) modulation of the quality of upwelled water; by physical events such as the passage of coastally trapped waves, the deepening of nutrient rich subsurface waters during ENSO events or the presence of areas of permanent high wind turbulence has been put forward as possible mechanisms influencing the resulting primary production (PP) following upwelling. By lacking a serious interpretative effort the work becomes too descriptive.

Response

The explanation on why the combination of upwelling with equatorward or upwelling with warm poleward current either enhances or suppresses NPP has been revised.

Comment

The data ought to be presented in the context of similar work: i.e. in terms of upwelling as a physical forcing of NPP. Although I am not too familiar with California current oceanography I understand that the research area is well sampled thanks to the Mexican IMECOCAL research program that conducts quarterly oceanographic surveys in the southern region of California since October 1977. My guess is that this program should provide the right framework and background information that can enrich the conclusions of the paper.

Response

No data from IMECOCAL research program were used because their grid is not sufficient to describe this upwelling region. Their stations are very far apart to show coastal variability.

We include in the discussion section the relevant features described in CALCOFI reports where the IMECOCAL program publish their results. Please see response to reviewer 1

Comment

The English needs to be improved throughout the text. At times it becomes too colloquial and lacks scientific rigour.

Response

After the final version of the new manuscript is finished, it will be sent it to an English language editor to improve the readability and reach scientific rigurocity of the text.

Comment

Abstract: will need to be changed to accomodate the suggestions of the referees.

Response

The Abstract was already modified according to referees suggestions and the new information. It now says:

The Gulf of Ulloa, a highly productive area off the western coast of Baja California Peninsula, is examined for five successive years (2003 - 2007) by using satellite data and seasonal net primary productivity estimates obtained from a vertical generalized production model. The results clearly identify favourable wind coastal upwelling conditions all over the year. However highest net primary productivity values occur from March to June. Results show that during the upwelling season an equatorward coastal current transports water from neighboring upwelling areas to the north of the Gulf of Ulloa, and in combination with local upwelling process produce the observed increase in net primary productivity. Our findings also reveal that the opposite situation occurs in late summer when a warm poleward current of tropical characteristics arrives to the region and inhibits the productivity in the whole region to get the lowest NPP levels of the year. Our findings reveal the importance of lateral advection in the modulation of the primary productivity in a subtropical upwelling region.

Comments

1 More up to date references are needed.

2 Far to much effort has been dedicated to a rather simplistic description of upwelling (by now a fairly well described phenomena).

3 As stated in the general comments a better effort to describe and to contextualize the main findings of the work presented is needed.

Response

1 The results, discussion and conclusion sections have been revised and restructured, some new references in the area of NPP, wind stress curl and upwelling process have been included. The new references are mentioned in the response to reviewer 1.

2 The references to Ekman process have been modified, please view response to reviewer 1.

Comment

page 1980, line 24 please define what is meant by "... coastal hydrographic properties..."

Response

It now says:

The California Current (CC) meanders offshore and modifies coastal hydrographic properties (temperature, salinity, oxygen, nutrient contents) when it approaches the coast.

Comments

page 1981 line 5 in agreement with anonymous referee 1 please define what is meant by properties

Response

Please see response to reviewer 1

Comments

page 1981 line 18 delete "been"

Response

It has been deleted

Comments

page 1982 line 1 is report the right word ??? should it not be "...In this paper ??..."

Response

It has been changed to paper

Comments

Methods

In general terms the Methods section is appropriate however a small reference to the limitations of the methodology employed and a better definition of NPP would enrich the paper. For instance several more recent works modelling Net Community Production (NCP) are currently being employed.

Response

To clarify the NPP concept, the following text has been added in the methodology section.

For the VGPM used in this paper, the NPP is a function of chlorophyll, available light, and the photosynthetic efficiency, it is chlorophyll-based using a temperature-dependent description of chlorophyll-specific photosynthetic efficiency (Behrenfeld and Falkowski, 1997).

We do not consider the use of Net Community Production is appropriated in the context of this research

Comments

1 page 1985 line 14 a comma after January is needed

2 line 15 use were instead of are (in general use past tense to describe results)

3 line 24 delete there page 1986

4 The section climatological maps of SST and currents (what currents ???) needs to be re-written to make it more clear.

5 page 1987 line 6 avoid colloquial english (“...is lightly present.....”)

Response

1 The comma was added

2 All the results are now in past tense form

3 The word there has been deleted

4 The section climatological maps of SST and currents it is called now:

Climatological maps of SST and geostrophic currents. It is has been re-written for more clarity (please refer to reviewer 1 response).

5 The colloquial form has been removed, it now says.....

..... is present.....

an effort to avoid the colloquial English from all over the text was also made