

Interactive comment on “Long term changes in the ecosystem in the northern South China Sea during 1976–2004” by X. Ning et al.

Anonymous Referee #2

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This manuscript reveals long term changes in physical (T, S, DO) and chemical (N, P, Si) parameter in the northern South China Sea (n-SCS) during 1976–2004. Over all, their data is very valuable and the data can provide useful and precious information of biogeochemical changes in the marginal sea, SCS, to the oceanographic community. In general the paper is well written and succinct, and the data interpretations are almost convincible. I strongly recommend that these data should be published in Biogeosciences.

General comments There are two points which I can not perfectly convincible author's interpretation of their data in the manuscript. One is in section 4.4–Response of ecological environment to ENSO event;. Authors show the comparison of fluctuations in environment parameter (T, S, DO, PO₄, SiO₃, DIN)

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to ENSO event at Station 4 on Figure 1. The data set for this discussion was only one snapshot in summer at station 4 in each year, and may be timing of the sampling was different among seasonal variability in every year. It is difficult to convince that the fluctuations significant related to ENSO, without any statistic analysis. Is the data from station 4 suitable for extract the only signal from open sea? In my understanding from the discussion part in this manuscript, section 4.1-4.3, station 4 data include a signal from river water discharge and coastal change. If authors can provide more clear explanation on this aspect, it would be better to understanding for readers that ecological environment response to ENSO event. Second is in section 4.5 Response of the ecosystem and living resources. As authors indicated in their discussion, one possible reason for the increase in both the cephalopod and demersal trawl catches (also in Fig. 10) could be attributed to the improvement of demersal trawl fishing techniques. It is difficult for evaluate only the effect of the increase in stock of lower trophic level. I think it is not easy to compare the long term trend of environment parameter to cephalopod and demersal trawl catches data.

Specific comments P 3738, line 8-10, I think authors can remove explanation of R_{xy} which was defined as the correlation coefficient and the nature number, from the abstract. P3738, line 15, N_{Pav} . In the text, it is represented by N_{Pav} . It is better to represent same symbol through the manuscript. I suppose N_{Pav} and SSN_{P} are better than N_{Pav} and SSN_{P} . Some of these are represented by SN_{P} ;

P3739, line 2 - 3, what is the world's 50 Large Marine Ecosystem; I think it is not necessary in introduction.

P3739, Line 16, Some unit is represent as m^3a^{-1} . I understand that a is may be $annual$, but it is better to represent by y^{-1} ; as follows in the manuscript.

P3739, line 13-19. Authors introduce an information of river material discharge until 1996-1998 with refer the Han et al., 1998 and Wang and Peng, 1996. Is there any information for river material discharge after 1998? It would be very useful information.

P3741, in method, Was the nutrients data collection started from 1989? The nutrients figures shows data from 1989. If so, author should describe collection period of the nutrient data set in to the method;

P3746, line 4~12, In the discussion on the increasing trend in temperature, authors discuss the increasing trend with air temperature and other area of the sea. Is there any change in water temperature which was discharged from Pearl River? May be the discharged water temperature affected more than air temperature in n-SCS area.

P3746, line 14, please add a reference paper for consistent with the increase in DIN observed throughout the global marginal seas;

P3748, line 14, Is it possible to add figure of changes in the depth of 20°C isopleths? It would be useful for explain upwelling changing affect. Also it is helpful for reader's understanding.

P3748, line 20, It is possible to calculate temperature effect on DO solubility and evaluate the contribution to DO decreasing.

P3749, line 11, If authors add information on river discharge flux of N, P, Si in both phases before and after 1998, it would be helpful information for readers.

P3752, line 10. Is this two phase; same phases as in N:P ratio discussion ?

End of review.

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