

Interactive comment on “Hypoxia disaster in waters adjacent to the Changjiang estuary” by X. F. Luo et al.

Anonymous Referee #2

Received and published: 25 July 2016

Based on a new and extensive dataset (cruises) the authors intent to relate the dynamics of hypoxic area (formation, spatial distribution, timing) in the Changjiang Estuary to local hydrodynamics features.

The strong hypoxic event documented highlights the scientific relevance of the issue.

The most important conclusion is that the interannual variability of hypoxic events in this region is primarily driven by physical processes rather than riverine run off or nutrient input (see comparison with Gulf of Mexico in Sect 4.4) and the details provided for this control. The authors details those physical process for two distinct regions, i.e 1. the southern estuary, where hypoxia is avoided in cases of Kuroshio Subsurface water northward extension and 2. the Changjiang Bank (or northern estuary) where hypoxia occurrence is related to persistent (haline) stratification triggered by the west-

C1

ward spreading of Changjiang diluted waters. Those conclusions are well supported by the summarizing Fig. 9. and form a understanding basis for a more extensive reading of local datasets.

The analysis is well documented and instructed, in the sense that observations are described and discussed in the lights of know dynamics of the region rather than passed through automatic statistical procedures. In my view this is positive given the complexity of local circulation features.

The abstract gives a clear summary of the results and conclusions.

I advise the publication of this manuscript, after considering of the few minor revisions listed below.

Major comments.

Sect 4.4 I think the discussion should include comments on the different timescales considered. Biogeochemical and physical drivers does not play on the interannual variability of hypoxia occurrences at the same time scales. Another issue is that the gulf of Mexico and the East China Sea differ by their openness, which might changes the relative importance of physical and biogeochemical drivers.

Minor Comments.

L62. "the influence of pycnocline on the spatial variation of hypoxia" -> the relationship between the pycnocline ?location? and spatial variation of hypoxia ?

L70 extra space in "t hat"

L73 Can you give reference for the blocking of oxygen exchanges by ocean eddies ? if not, remove.

L103 senor -> sensor

L111 references needed for the "investigation standards"

C2

L112 phycnocline -> pycnocline

L148. Either "reached 30m at station K3", or " reached 20-30 m from stations K2 to K6"

L166.and Fig 8 can you give more references or the method used to locate the frontal zone.

L172 oxygenate aeretion -> oxygenation or ventilation

L176. Reference for characteristic oxygen concentrations of the KSW.

L184 Tsushima strait is not on the map Fig1.

L191. "was consistent"

L201 rephrase "the persistence of stratification was insufficient for oxygen consumption"

L204 "DO was rapidly consumed" -> "was rapidly depleted".

L216 rephrase: "The absence of DO-rich water input from upstream led to .. "

L217 "rest" -> "other"

L243 remove the uppercase from Log and put N² inside ()

L259 "was far more less" -> "was lower by far"

L273 needs -> requires

L286 remove "of"

L296 involve -> evolve

L305 last sentence has to be rephrased to something like "Our conclusions could support the prediction of hypoxia based on the evolution of bottom and surface salinity"

References : Chen et al is 1988 on L.29 and 1998 in the references; Zhao et al 1985,

C3

not reffered to in the manuscript

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., doi:10.5194/nhess-2016-59, 2016.

C4