Interactive comment on "Changes in detrital sediment supply to the central Yellow Sea since the Last Glacial Maximum" by Hyo Jin Koo and Hyen Goo Cho

Sonal Khanolkar (Referee)
sonal.khanolkar@mpic.de
Received and published: 23 July 2020

The study by Koo and Cho, is relevant and appropriate for the journal. I have attached an annotated copy with my detailed comments.
ANSWER. Thank you for the valuable remarks. We modified the manuscript according to comments.

There are a few points in the manuscript which need clarification:
1) The study mentions that the core PCL14 provides more records of the CYSM since the LGSM, compared with previous cores studied. Why is this so? Is it because the core recovery of PCL14 is better than the previous studies? If yes than this point should be mentioned.
ANSWER. The core 11YS-PCL14 is 702 cm recovered deeper than other studied cores around here (YSC-1; 437 cm, EZ06-1; 370 cm, EZ06-2; 360 cm). Since the thickness of the Central Yellow Sea Mud (CYSM) becomes thinner from the west to the east, our core, which is located in the eastern CYSM, involves older records than surrounding studied cores. We added this in the Materials and methods part. "The core 11YS-PCL14 is 702 cm recovered deeper than other studied cores around here (YSC-1; 437 cm, EZ06-1; 370 cm, EZ06-2; 360 cm) (Li et al., 2014; Lim et al., 2015)."

2) It is not clear why Unit 2 was further subdivided and what was the basis for it. If it was subdivided further than one should include difference in the provenance using trace element, clay minerals or Nd isotopes in the conclusion part as well. The conclusions should be rewritten and be split into points. Avoid using sentences in the past tense throughout the manuscript. Overall, the manuscript is well structured and presents an important study.
ANSWER. During the Unit 2, geochemical proxies and grain size were largely similar, but clay mineral compositions (especially the content of smectite) differed significantly. Therefore, we subdivided Unit 2 into two units based on the variation of clay mineral composition and explained in more detail in the manuscript.

◆ PDF-os-2020-60-RC2-supplement

Abstract

Line 12: The last deglaciation - late last deglaciation (mention kyr)

ANSWER. We added the period.

1. Introduction

Line 26: continent?

ANSWER. We removed this word.

Line 53-55: avoid past tense

ANSWER. We revised as mentioned.

2. Oceaonography

Line 57-61: This sentence is too long and confusing. Rephrase

ANSWER. We revised this sentence to avoid confusion. "The hydrodynamic system in the Yellow Sea is characterized by two major circulation patterns (Fig. 1). One is a counterclockwise gyre in the western part consisting of the Yellow Sea Warm Current (YSWC) and Yellow Sea Coastal Current (YSCC) (Beardsley *et al*., 1985; Yang *et al*., 2003). …"

Line 67: CDW - Is this a river? Please state if it is so. Not very clear here.

ANSWER. The Changjiang Diluted Water (CDW) is low-salinity water flow by the amount of freshwater input from the Changjiang. We revised the content related to CDW more clearly. "On the other hand, amount of freshwater input from the Changjiang to the Yellow Sea forms the plume of low-salinity water, called as the Changjiang Diluted Water (CDW) (Sukigara et al., 2017). A part of the CDW spreads eastward, reaching as far as Jeju Island and Korea Strait (Hwang *et al*., 2014; Li *et al*., 2014a)."

Line 67 : delete 'most'

ANSWER. We revised the sentence related to CDW including this word.

Line 70-71: What kind of different water masses? Why is it important here in the paper? Please state a reason.

ANSWER. The oceanic fronts such as SDF, JSCF, and WKCF separate different water masses in the central and coast of the Yellow Sea. These are closely related to the sediment transports and sedimentation in the area. Since the formation of modern oceanic circulation, the oceanic fronts restrict river-derived sediment from entering the center of the Yellow Sea and cause them to move along the coastal currents. We revised this sentence more clearly. "These fronts play an important role in shaping Yellow Sea currents as well as in understanding sediment transport, as they separate different water masses in the centre and coast of the Yellow Sea and appear a barrier effect for sediment

(Huang et al., 2010; Li et al., 2014a; Koo et al., 2018) (Fig. 1)."

3. Materials and metods

Line 76: AMS14C - space should be added between AMS and 14C

ANSWER. We revised as mentioned.

Line 87: Word missing. 'riverine sediments'?

ANSWER. We revised as mentioned.

Line 89: Which method was followed for sample dissolution?

ANSWER. We added detailed method and appropriate references in regard with the isotope analysis. "The inorganic silicate fraction was extracted from 18 samples following the method described by Rea and Janecek (1981). The samples were treated with acetic acid buffered to pH 5 with sodium acetate to remove calcium carbonate. They were subsequently treated with a hot sodium citrate-sodium dithionite solution buffered with sodium bicarbonate to remove coarse biogenic components and finally treated with Na2CO3 solution to remove biogenic silica. 143Nd/144Nd and 87Sr/86Sr analyses, including chemical separation and multicollector thermal ionization mass spectrometry (VG54-30, Isoprobe-T) analyses were performed at the Korea Basic Science Institute following Cheong et al. (2013)."

4. Results

Line 99: based on the variation trends - variation trends of what? why this division was done further is not very clear

ANSWER. During the Unit 2, geochemical proxies and grain size were largely similar, but clay mineral compositions (especially the content of smectite) differed significantly. Therefore, we subdivided Unit 2 into two units based on the variation of clay mineral composition and explained in more detail in the manuscript.

Line 104-106: Why is this so? Was the recovery better in the core of this study than the previous study? Please give a reference about which previous studies you are mentioning here.

ANSWER. We added the references (Li et al., 2014a and Lim et al., 2015) about previous studied cores (YSC-1, EZ06-1, and EZ06-2) in the central Yellow Sea. The core 11YS-PCL14 is 702 cm recovered deeper than other studied cores around here (YSC-1; 437 cm, EZ06-1; 370 cm, EZ06-2; 360 cm). Since the thickness of the Central Yellow Sea Mud (CYSM) becomes thinner from the west to the east, our core, which is located in the eastern CYSM, involves older records than surrounding studied cores. We added this in the Materials and methods part. "The core 11YS-PCL14 is 702 cm recovered deeper than other studied cores around here (YSC-1; 437 cm, EZ06-1; 370 cm, EZ06-2; 360 cm) (Li et al., 2014; Lim et al., 2015)."

5. Discussion

5.1. Provenance discrimination based on clay mineralogy

Line 130: was utilized - is utilized, Please avoid writing in past tense

ANSWER. We revised as mentioned.

Line 135-136: what is every clay mineral composition? Rephrase

ANSWER. We removed the 'every'. "And then clay mineral compositions except illite decrease in Unit 2-1"

Line 141: were suggested - suggest

ANSWER. We revised as mentioned.

Line 144: Repetition marked highlighted. Consider omitting the first highlighted line about Unit 1.

ANSWER. We modified this sentence. "Consequently, clay mineralogical results suggest that the provenance of fine-grained sediments are changed according to each unit as follow; fine-grained sediments during the Unit 3 and 4 were supplied from all potential provenances, the influence of the Changjiang increased gradually during the Unit 2, Unit 1 sediments were mainly originated from the Changjiang."

5.2. Geochemical approaches

Chapter title - Consider changing the section heading to "provenance discrimination based on geochemistry"

ANSWER. Thank you for your valuable advice. We revised as mentioned.

Line 146-149: Start of the sentence should be different. These can mean anything mentioned in the previous sentence, not just REE or trace

ANSWER. We revised the start of the sentence to 'The trace elements and isotopes' as mentioned.

Line ~155: Various other major and trace elements are used as proxies. This section can be improved.

Please refer to Chaudhuri et al., 2020, Marine and Petroleum Geology or Chaudhuri et al., 2020, Geological Magazine and more references on use of trace elements and Sr-Nd isotopes. May compare composition of Huanghe, Changjiang and other rivers with those of your samples.

ANSWER. Thanks for the valuable and constructive comments. We checked the references mentioned, and compared various proxies (e.g. Th/Sc, Cr/V, Th/Co, CIA, ICV). However, when we applied these proxies to this study, the potential provenances (the Huanghe, Changjiang, and western Korean rivers) were not distinguished well, and the difficulty due to the grain size effect remained, so we did not add these proxies.

Line ~170: Fig. 5 legend missing

Cite the reference for the values used for normalisation? Original paper reporting the values. Mention in figure caption as well.

ANSWER. We added the reference 'Taylor and McLennan (1985)' about original paper reporting the values of upper continental crust.

Line 180-181: 'The association between an increased impact of Korean rivers and coarse sediments was identified in an isotope analysis before ~8 ka in core YSC-1 (Hu et al., 2018).' Please rephrase the sentence for clarity.
ANSWER. This sentence was rewritten more obviously. "The results of the isotope analysis in the core YSC-1 also showed an increased impact of Korean rivers and coarse sediments before ~8 ka, which is consistent with our results (Hu *et al*., 2018)."

5.3. Paleo-environmental implications for sediment provenance changes
Line 213: delete 'still'
ANSWER. We revised as mentioned.

Line 214: showed – shows
ANSWER. We revised as mentioned.

Line 228: study area - the study area
ANSWER. We revised as mentioned.

Line 245: sedimentation – sediments
ANSWER. We revised as mentioned.

6. Conclusions
Line 251-253: Split the conclusion into seperate points, especially for the various units.
ANSWER. We rewrote the conclusions by subdividing each unit.

Line 255: Unit 2 (280–130 cm; 12.1–8.8 ka) - What about unit 2-1 and unit 2-2? why was unit 2 subdivided?
ANSWER. We rewrote the conclusions part by dividing Unit 2 into Unit 2-1 and Unit 2-2.

Figure 2
What is contents, marked in this figure? Not very clear
ANSWER. We modified the Figure 2 clearly. Figure 2 shows thickness of uppermost mud deposit (a) and the correlation between the present study core (11YS-PCL14) and surrounding reference cores (YSC-1, EZ06-1, and EZ06-2) (b). Our core is divided into four units by grain size, and extends well with the reference cores. In addition, the core 11YS-PCL14 provides more records than other cores, because the core has long length and thin uppermost mud layer.

Figure 5

What is UCC? Mention the fullform in the fig caption

ANSWER. We added the full form of UCC (Upper Continental Crust) in the figure caption.