Interactive comment on "Variability in copepod trophic levels and in feeding selectivity based on stable isotope analysis in Gwangyang Bay off the southern coast of Korea" *by* Mianrun Chen et al.

Anonymous Referee #2

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Biogeosciences Discuss., https://doi.org/10.5194/bg-2017-364 Chen et al., Variability in copepod trophic levels and in feeding selectivity based on stable isotope analysis in Gwangyang Bay off the southern coast of Korea

General Comments: Chen et al report seasonal and spatial variations of copepods on 13C and 15N values in a temperate estuarine system. They present a nice description of these data and use a lot of mathematical analysis models (linear mixing models, Bayesian isotopic mixing models and generalized additive models) to deeply analyze the trophic structure of plankton. I am in favor of some salient results on averaged trophic position of different copepods and contribution of two size fractions of diets.

These kinds of results are hard to be obtained by direct measure as copepod community is highly complex so that the individual samples are difficult to separate, which also claimed by the authors. Although the size-selective feeding behaviors of copepods are not new in literature, the patterns shown in this manuscript are reasonable. More important, it still provides a powerful technique to treat such investigation data that can be followed by readers and provide insight biogeochemical information about the trophic interaction between copepods and primary producers. Therefore, this is potentially a very useful paper providing important information and methods for the biogeochemical study (i.e., food resources and trophic levels) in the complex coastal ecosystem, as well as the influence of the freshwater input in an estuary.

The main shortfall of this manuscript is that it can only provide the trophic information of several major genera of copepods. Genera with low biomass or appearance frequency like Euchaeta, Calanus and Oithona, which are also popular in the world ocean cannot be treated by the same way. In addition, I would like to suggest more discussion about the uncertainty or disadvantages of these analysis models. And, reasons for some results on feeding pattern of some species are not discussed enough. For example, what are the mechanism of the feeding selectivity of the three carnivorous genera–Tortanus, Labidocera, and Sinocalanus? Finally, it will be more visual if the authors can provide a conceptual map about the planktonic food web from their conclusion, showing the relationship and the seasonal differences of the energy flow on this map as well? Overall, I recommend this manuscript for publication in Biogeosciences with minor revision. Some specific comments are indicated below.

Specific comments: 1. A reason or a reference to calculate trophic enrichment is needed. 2. L21 μm 3. How about the errors or residual (eq. 4) for Linear regression models? 4. Y-axes in Figure 5 to 11 need plural number. 5. Increase the resolution of Figure 3.