

## ***Interactive comment on “Differential responses of seabirds to inter-annual environmental change in the continental shelf and oceanic habitats of southeastern Bering Sea” by T. Yamamoto et al.***

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This study on two species of sympatric seabirds breeding in a sub-arctic region reported differences in the foraging habitat, physiological stress level and isotopic foraging niche between the two species as well as between two consecutive years. The main focus was on the mechanistic response of marine top predators to climate changes, and the authors discussed the results in terms of inter-annual changes in SST and timing of sea-ice retreat in the Bering Sea.

I agree that it is important to understand behavioural and physiological processes linking climate changes and seabirds' productivity. I found it especially interesting that one

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species (RLKI) seemed not to change behaviours between the two years with different breeding success rates, while the other (TBMU) seemed to change behaviours and to keep their breeding success rates high. I also felt, however, there are some issues to be reconsidered. For revision of the manuscript, I would like to make suggestions as below.

General comments:

1)

Comparisons of various parameters between two years looked robust and implied a potential link between seabirds' behaviours, physiological states and environmental conditions. However, I think it is difficult in principle to say that this study investigated “seabirds' responses to inter-annual differences of marine environments”, because the data were obtained only from one cold year and one warm year. The inter-annual changes in seabirds' behaviours can happen independently from environmental changes. To examine the correlation, at least one more year of data would be required. For this reason, I would like to suggest changing the title and some relevant sentences (e.g. pp. 17703, L5-6; ...responses to the ocean variability differed...).

I am not sure if it works, but one possible option to ease the issue described above may be to mention a prediction or hypothesis about seabirds' response to cold/warm years in Introduction (not in Discussion). For example, if some predictions from previous reports (like L7-10 in pp. 17706; Piscivorous birds breeding...) are put in Introduction, the present discussion may become convincing because of consistency with the predictions.

2)

According to Results, GPS loggers failed to record some parts of a track in most trips. Is it possible to provide rough estimates of the proportion of the periods during which positional data were lost in each trip (e.g. [duration of data]/[duration between deploy-

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ment and recovery])? This information should be essential to interpret distributions of foraging locations. If the proportion of the lost positions was substantial, the actual peak of the histograms in Fig. 2 could be different from the recorded one. Then, discussion on the peak values and bimodality may not be appropriate (e.g. pp. 17701, L 10-11).

Minor comments:

3) pp. 17699, L 24-25:

- Did these periods of data from geolocators and accelerometers correspond to those of GPS loggers? It would be good to show that the same periods were compared.

- How many birds were deployed with geolocators and accelerometers?

4) pp. 17700, L 25:

Information on types of error distribution may be required.

5) pp. 17701, L 8:

How many on-water locations were obtained?

6) pp. 17705, L 8:

A short note on CORT values reported in previous studies would be helpful for readers to understand the present results (what concentrations are considered to be high).

7) Fig. 1:

It would be useful to indicate the position of the island in the maps.

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Interactive comment on Biogeosciences Discuss., 12, 17693, 2015.