

# ***Interactive comment on “Expansion of great cormorant colony immediately increased isotopic enrichment in small mammals” by Linas Balčiauskas et al.***

**Anonymous Referee #1**

Received and published: 9 February 2018

This study examined the effects of great cormorant's colonies on nutrient inputs into forest ecosystems using stable N and C isotopes. The goals of this study were to test (1) whether the expansion of the cormorant colony immediately affected the nutrient input to a forest ecosystem and (2) whether the nutrient derived from cormorants influenced the isotopic signatures of the basal food resources and small mammals. It is known that recent rapid growth of great cormorant colonies had negative impacts on many terrestrial ecosystems. In addition, the linkage between the aquatic and terrestrial ecosystems has been one of the main topics in ecological studies. Therefore, this study might attract many readers from the fields of both applied and basic sciences. However, I have some concerns about the design and the novelty of this study.

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The first goal of this study as mentioned in Page 3 L 26 seems too obvious. It should be clear that the nutrient input increases as the number of great cormorants and the faecal deposit become greater in the new habitat. I suppose that the authors intended to mention that they aimed to show how rapidly nitrogen derived from the great cormorants were used by primary produces and the consumers at higher trophic levels. Even if this were one of their goals, the presented data would seem not enough to achieve the goal. The data used for this purpose were the isotopic signatures of two species of small mammals at a single control site in 2014 and at the same site but inhabited by the great cormorants in 2015. I think that replicated study sites would be necessary to examine statistically the effects of colony expansion on the isotopic signatures of consumers. In addition, the statistical results (Table 2) showed that there was almost no significant difference in  $^{15}\text{N}$  of the two small mammals between before-expansion (2014) and after-expansion (2015). It seems at least to me that the small mammals were not dependent on the cormorant-derived N, which is not consistent with the conclusion of this study (e.g., P2 L15). Please explain from which datasets the conclusion was drew. Regarding the second goal, the authors had already shown that the great cormorant colonies significantly affected the isotopic signatures of the small mammals in their previous study published in 2016. Therefore, although I recognize the importance of datasets of the basal food sources presented by this study, the goal and the obtained results seem highly confirmatory.

Minor comments: P2 L2: "and" damage P2 L12: It was not surprising to me. It simply indicates that the plant used more cormorant-derived N than the invertebrates. P3L14: It would be better to describe the background and the importance of this study based not on the authors' group interest, but on the scientific interest. P3L23: This sentence (gender and age) is not necessary here. P5L2: If the authors think this information (Table 1) is necessary, please provide it as a supplementary file. P8L3: Which datasets showed the influences of great cormorants on small mammals? Please explain. P8L24-P9L13: This subsection seems not directly related to the aims of this study. P9L20: This sentence is unclear. Please clarify. Fig.1: This figure seems a



bit puzzling. The yellow line in Fig.1 (b) was explained as colony area, but the area included not only colony zone, but also ecotone zone. Please consider modifying the figure and legend.

**BGD**

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Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2017-492>, 2017.

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