This study evaluates how carbon fluxes of river riparian areas seasonally respond to flooding by investigating the CO2 and dissolved carbon fluxes during pre- and post-flooding seasons. The methods were generally well established and results were generally well discussed. In particular, authors discussed how vegetation and the post-flooding change of riparian vegetation species and richness affect/determines net carbon fluxes in river riparian areas. I think this could be a valuable contribution to this area.

We appreciate the positive comments on our manuscript. Below, we have addressed all issues raised by the reviewer. Please see below for details.

Note: The line numbers shown in the bracket in our response are referring to the line numbers in the revised manuscript.

One thing that might be ambiguous to audience is that authors use terms like "pre-flooding", "flooding" and "post-flooding" to describe their measurements in different seasons. This might be a bit misleading because floods often refer to short-term events. Considering authors evaluated these carbon fluxes on a seasonal base, I'd suggest authors changes these expressions to pre-flooding seasons, flooding seasons and post-flooding seasons instead. I have only a few minor comments on the rest of the manuscript. See below,

Thanks for pointing this out. We agree that the original expressions can lead to misunderstanding. We have checked throughout the manuscript and used pre-flooding season, flooding season, and post-flooding season to describe our measurements. See below for a few examples,

"… we quantified the vertical CO_2 fluxes at the soil-air interface and water-air interface **during the flooding season** and **non-flooding seasons (pre-flooding season and post-flooding season)** based on two-year in-situ measurements along the Lijiang River." (Line 124-126)

"…we find that the fluvial area turned from a carbon source in **pre-flooding season** and **during flooding season** to a carbon sink **in post-flooding season**." (Line 323-325)

"The species richness index decreased from 2.945 **in pre-flooding season** to 1.695 **in post-flooding season** (Table 1, Table A3)." (Line 342-343)

Line 174: in different seasons

Corrected accordingly. See below,

"…we directly measured the CO_2 fluxes in the riparian area with and without vegetation (bare soil) **in** different seasons." (Line 269)

Line 175: we first reviewed the diel cycle.

In the revised manuscript, the paragraph has been restructured and the idea is conveyed in another way. See below,

"We assume that diel CO_2 flux follows similar patterns as measured on the selected days during the pre-flooding season and post-flooding season. Based on this assumption, we compared the diel CO_2 flux of pre-flooding season and post-flooding season. In order to evaluate the effect of vegetation on riparian CO_2 flux, we directly measured the CO_2 fluxes in the riparian area with and without vegetation (bare soil) in different seasons. Significant diel variations in CO_2 fluxes were observed in the riparian area…" (Line 266-269)

Line 176: change "the terrestrial area" to "riparian soils" or "riparian area", same below

We agree that "riparian area" or "riparian soils" would be more appropriate. We have changed all "terrestrial area" into "riparian area", which indicates the measurements on land. See examples below,

"In April, carbon sequestration in the **riparian area** with vegetation was observed between 10:00 to 14:00 hours; while in October, the carbon sequestration is observed between 6:00 to 14:00 hours (Fig. 1)." (Line 275-277)

"The **riparian area** is composed of vegetation area and bare soil." (Line 291)

Line 183: "terrestrial area with vegetation" to "riparian area with vegetation"

Relevant expressions have been modified accordingly.

"Thus, in post-flooding season, **the riparian area with vegetation** sequestrated carbon for a longer time. Indeed, the vegetation area's all-day CO_2 flux was 0.358 $g \cdot m^{-2} d^{-1}$ in April…" (Line 277-278)

Line 200-203: the sentence repeat line 186-188. Consider delete one of them

Thanks. The repeated sentence is deleted, and the paragraph is restructured. See below,

"The riparian area is composed of vegetation area and bare soil. During the field investigation, we found the vegetation coverage in Lijiang riparian area is about 60%. Using vegetation coverage as the weight, we can get the accumulated CO_2 flux of riparian area (Section 2.2.4, equation (3)). Within a day, the carbon sequestration in the riparian area peaked at 14:00 (April: -62.680 $mg \cdot m^{-2} h^{-1}$; October: -68.813 $mg \cdot m^{-2} h^{-1}$), and the maximum carbon emission occurred at 18:00 (April: 36.347 $mg \cdot m^{-2} h^{-1}$; October: 14.110 $mg \cdot m^{-2} h^{-1}$; Fig. 1). In both April and October, the all-day carbon fluxes in the riparian area were negative, indicating that the riparian area acted as a carbon sink in non-flooding season (April: -0.156 $g \cdot m^{-2} d^{-1}$, October: -0.500 $g \cdot m^{-2} d^{-1}$). The carbon uptake in October, which represented the post-flooding season, was higher. Overall, we found that in the post-flooding season, the riparian vegetation can sequestrate CO_2 for a longer time and fix a higher amount of carbon. **Thus, even though the all-day CO_2 flux of bare soil changed from -0.927**

$g \cdot m^{-2} d^{-1}$ to -0.231 $g \cdot m^{-2} d^{-1}$, showing a reduced capacity of carbon sequestration after flooding, the whole riparian area still turned out to be a carbon sink in the post-flooding season." (Line 291-309)

Line 241: is the water-air carbon flux (Fig. 2b).

The figure number is added to the sentence. See below,

"During the flooding, the riparian areas with and without vegetation were submerged, so only the carbon fluxes from the water-air interfaces were measured **(Fig.1b)**." (Line 321-322)

Line 285-286: no need to capitalize first letters

Corrected accordingly. See below,

"We measured total organic carbon (TOC) and total inorganic carbon (TIC) in riparian soils and the fluvial area during different periods." (Line 367)

Line 313: needs further analysis

Thanks. The sentence has been modified. See below,

"Also, besides the contribution of recovered vegetation, our data shows that bare soil also contributes to the carbon neutralization, but the mechanism for bare soil to capture carbon still **needs further analysis**." (Line 498-500)

Line 332: the riparian zone thus has …

In response to comments from reviewer #2, we have re-organized the results and discussion sections of the manuscript. This section (Section 3.6) has been removed from the revised manuscript. See also response to Reviewer#2 on Section 3.6.