



Assessing the effects of land use/cover change on carbon dioxide fluxes in a semiarid shrubland

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Land use/cover change has been generally considered a local environmental issue. Our study focuses on the effects of land use/cover change on the carbon cycle using long-term continuous field observation data, which is measured by the eddy covariance (EC) technique. The study site is at Yulin (38.45N, 109.47E), which is a desert shrubland ecosystem in Mu Us sandland, China. Before June 2012, the vegetation in this site was covered with mixed vegetation: typical desert shrubs (e.g., *Salix psammophila* and *Artemisia ordosica*) and grass. After July 2012, a part of the land use/cover condition within the footprint was changed by the local farmers, which converted the land use/cover condition changed first from mixed vegetation to bare soil and then from bare soil to grassland resulting from the re-growing grass.

Four-year carbon fluxes are selected and separated into three periods: Period I is from July 1 2011 to June 30 2012 when land use/cover condition did not change; Period II is from July 1 2012 to June 30 2014 when land use/cover condition changed from mixed vegetation (shrubs and grass) to the mix of bare soil and desert shrubs; Period III is from July 1 2014 to June 30 2015 when land use/cover condition changed from the mix of desert shrubs and bare soil to the mix of desert shrubs and re-growing grass.

A linear statistical model will be used to evaluate and quantify the effects of land use/cover change on the uptake or release of carbon fluxes (net ecosystem exchange (NEE), ecosystem respiration (Reco) and gross primary production (GPP)). Moreover, this study is expected to get insights into how agricultural cultivation influences on the local carbon balance (e.g., how NEE, Reco and GPP respond to the land use/cover change; Is the annual carbon balance changed during the land use/cover change process; and the contribution of land use/cover change on these changes of carbon fluxes).