**RC1: 'Comment on essd-2021-361', Anonymous Referee #1, 16 Nov 2021**

Through a dynamic downscaling approach, the authors provided a high-resolution (9km) climate dataset for CA covering 10 commonly used meteorological elements. The manuscript is well organized while requiring minor revisions.

(1) Title: In fact, this study does not show ecological or hydrological applications of this high-resolution dataset. Therefore, the phrase “for ecological and hydrological applications” should be removed from the title.

Reply: We removed "for ecological and hydrological applications" from the old title. The new title is “HCPD-CA High-resolution climate projection dataset in Central Asia”.

(2) Introduction: Why this method is used for downscaling of climate projections. A criticism-featured literature review on downscaling methods is needed.

Reply: We added a review of the dynamical downscaling method, to explain the necessity of using this method for projecting the local climate in Central Asia.

“Global climate models (GCMs) can describe the response of the global circulation to large-scale forcing, such as greenhouse gases and solar radiation (Giorgi, 2019). But their horizontal resolutions are too coarse to account for the effects of local-scale forcing and processes, such as complex topography, land cover distribution, and dynamical processes occurring at the mesoscale (Giorgi et al., 2016;Qiu et al., 2017;Torma et al., 2015). To obtain the accurate information on region-scale climate change, dynamical downscaling as well as statistical downscaling has been developed and widely applied in regional climate projections over main areas, like East Asia (Zou and Zhou, 2017;Bao et al., 2015;Zou and Zhou, 2016;Tang et al., 2016;Jiang et al., 2021;Guo et al., 2021;Hong et al., 2017;Ji and Kang, 2013;Jung et al., 2015), North America (Giorgi et al., 1994;Di Luca et al., 2013, 2012;Pierce et al., 2013;Racherla et al., 2012;Wang and Kotamarthi, 2015;Wang et al., 2015), and Europe (Déqué et al., 2007;Gao et al., 2006;Jacob et al., 2014;Kotlarski et al., 2014;Vautard et al., 2013;Fischer et al., 2015;Giorgi et al., 2016;Im et al., 2010;Kotlarski et al., 2015;Torma et al., 2015;Zittis et al., 2019). Some efforts have also been devoted on regional climate projection in CA with the dynamical downscaling method (Zhu et al., 2020;Ozturk et al., 2017;Mannig et al., 2013). However, their resolutions are still low (≥30km), especially for the mountainous areas in the southeast. Moreover, most of the previous RCM simulations in CA used a single GCM as the lateral boundary conditions, which harbor high uncertainties in the projected climate changes.” (L31-47 in the revised MS)

(3) Model and experiments- Bias-correction technique: why did you choose these three GCMs (MPI-ESM-MR, CCSM4 and HadGEM2-ES)? The authors need to add an explanation in the manuscript.

Reply: “The reasons why we chose these three GCMs are as below: they can provide all the variables that are needed to drive the regional model; they have relatively high horizontal resolution (Table 2) among the CMIP5 models; they have fairly good performance in simulating the local temperature and precipitation in CA (see Fig. S1-4 in Qiu et al., 2021), though systematic biases exist partially due to their coarse resolution.” (L100-104 in the revised MS)

*Ref: Qiu, Y., Feng, J., Yan, Z., Wang, J., and Li, Z.: High-resolution dynamical downscaling for regional climate projection in Central Asia based on bias-corrected multiple GCMs, Climate Dynamics, 10.1007/s00382-021-05934-2, 2021.*