浙江師範大學
ZHEJIANG NORMAL UNIVERSITY

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The millennial-scale climatic variability in central Asia during last glacial

Jia JIA,

Zhiyuan WANG, Leibin WANG, Jianhui CHEN

Email address: jiaj@zjnu.edu.cn

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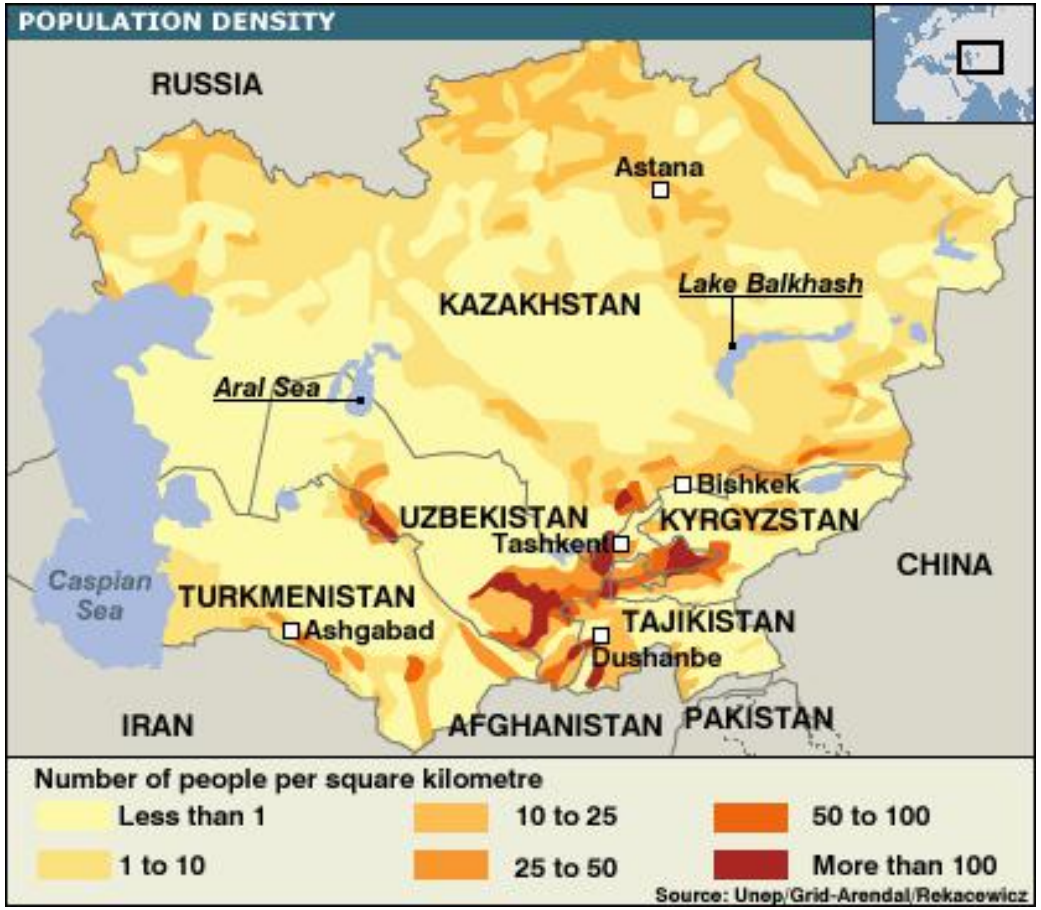
The arid environment

The area is geomophologically characted by humid mountains and arid basin.

The human settles in the oasis



Argriculture country:

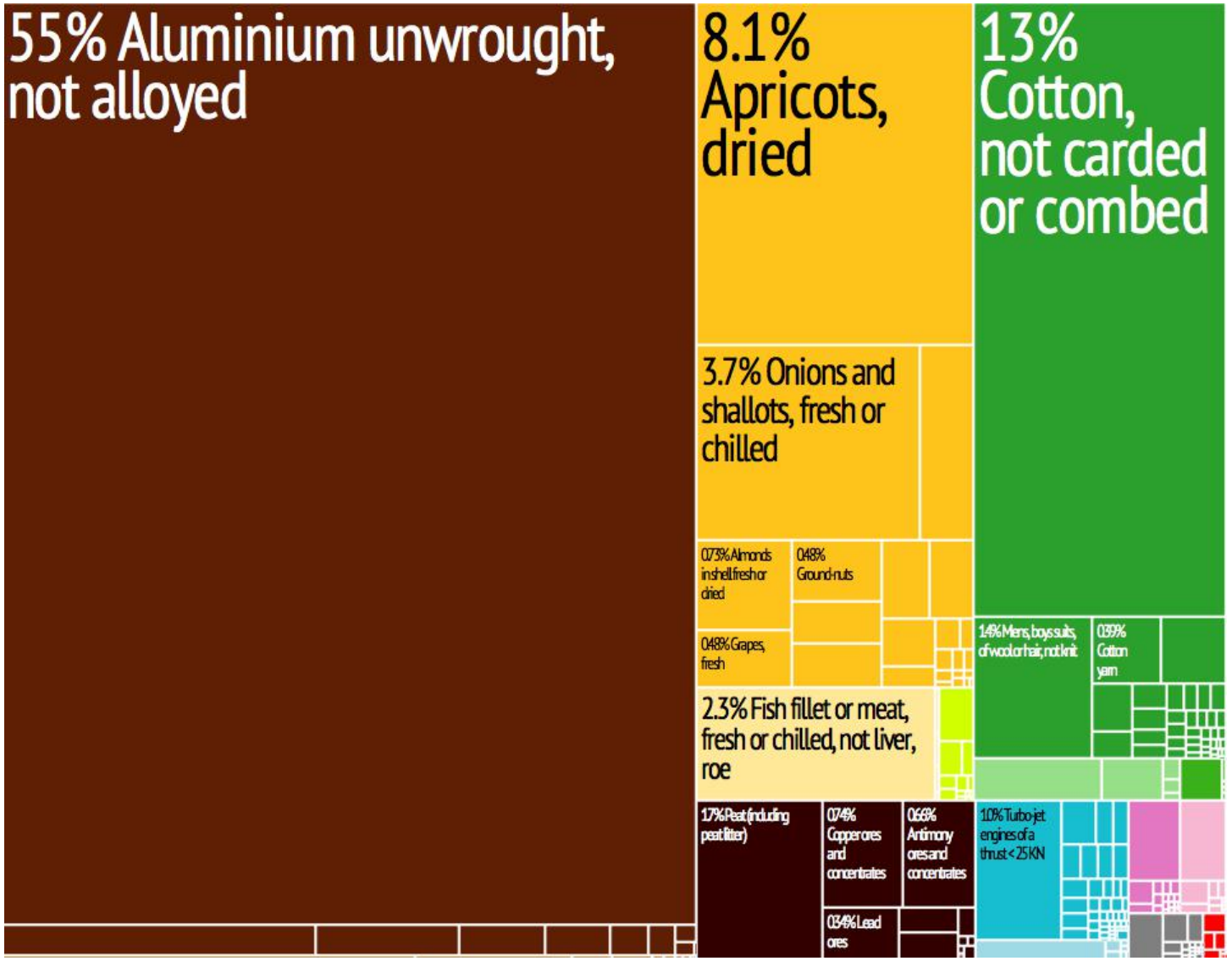
rural population at more than 70% ;

agriculture accounting for 60% of employment;

around 30% of GDP.

Source from: wiki

Tajikistan's product exports in 28 colour-coded categories



The society sensitive to climate change!

Due to practicing the traditional farming methods

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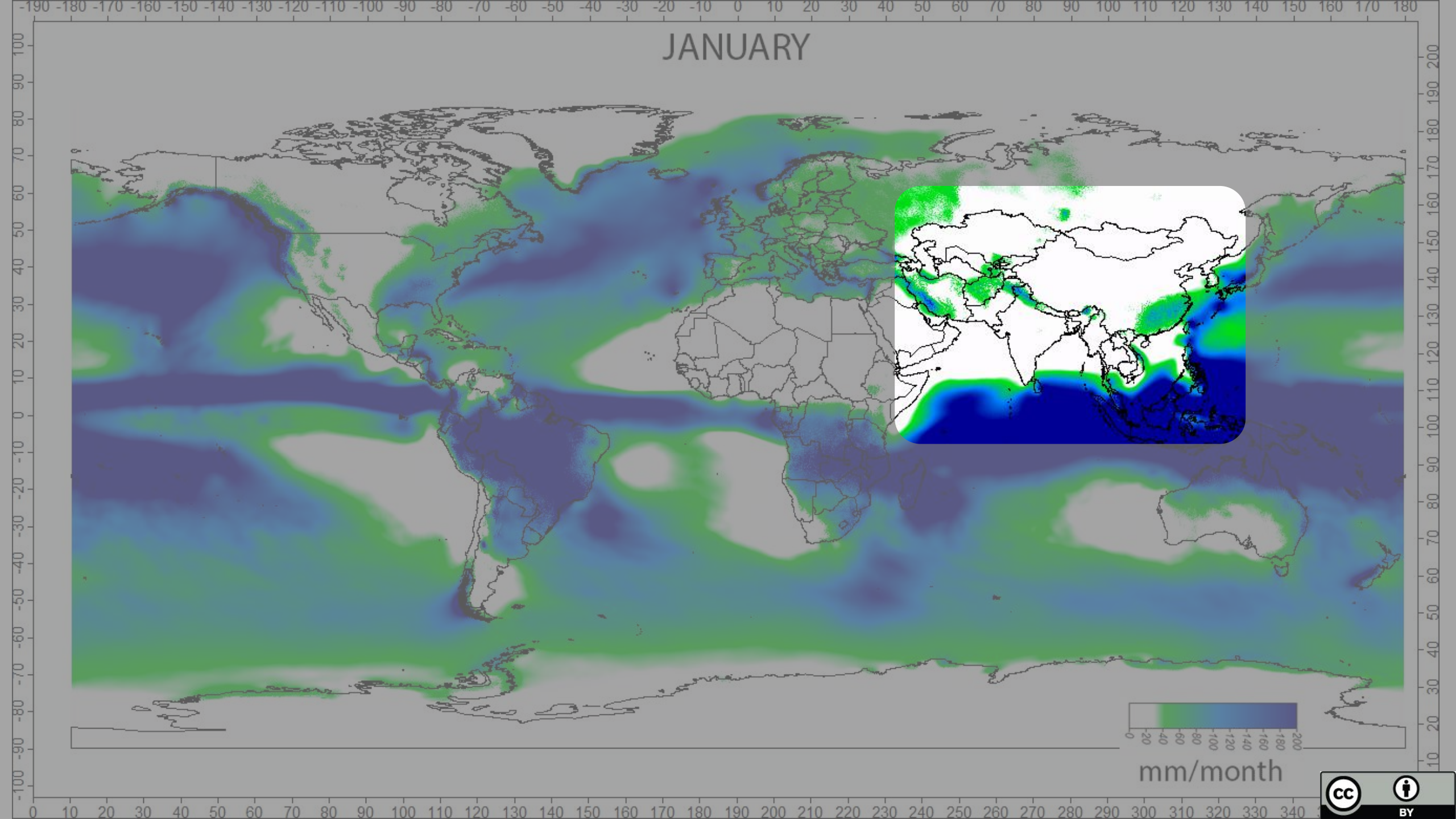
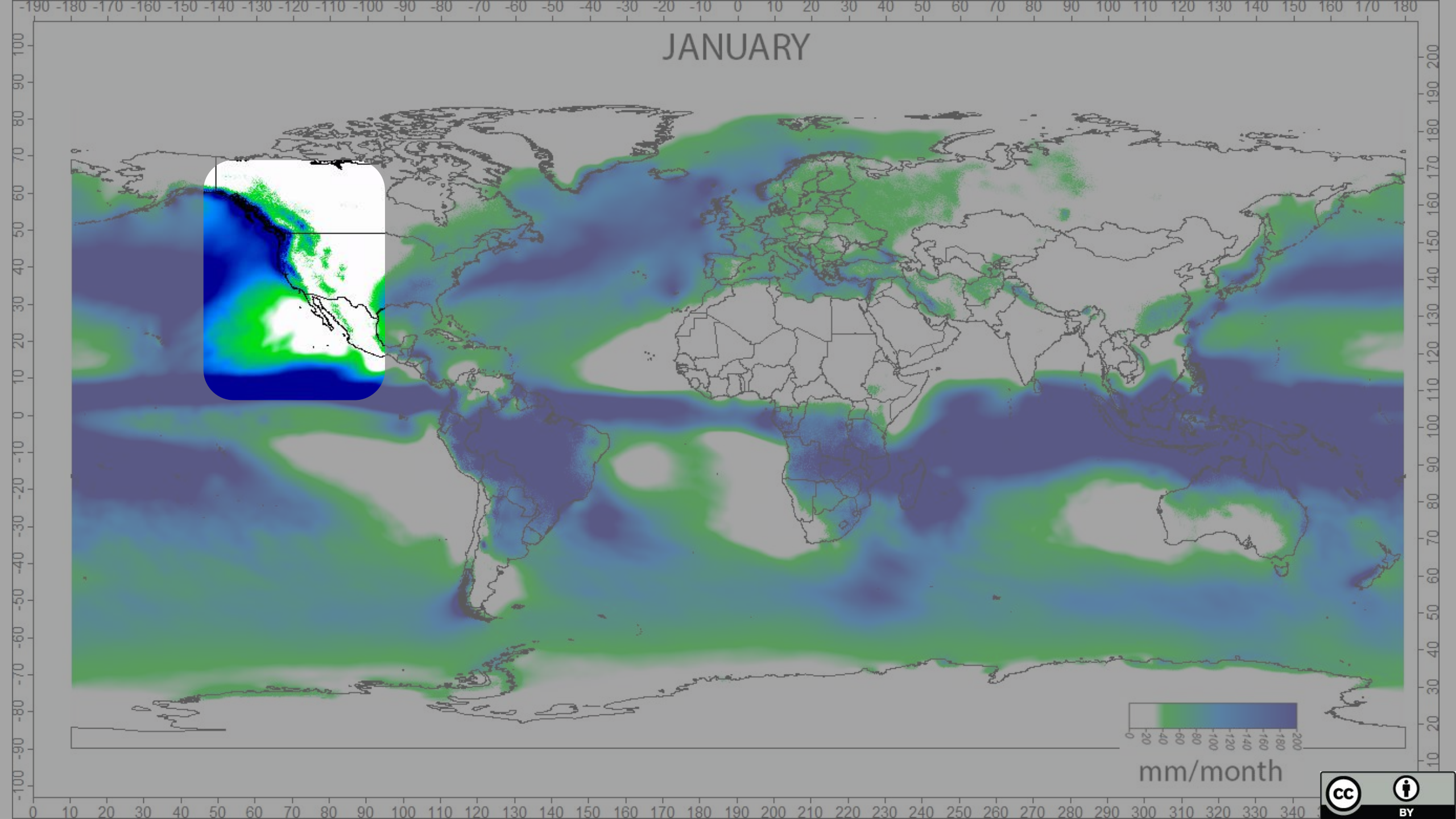
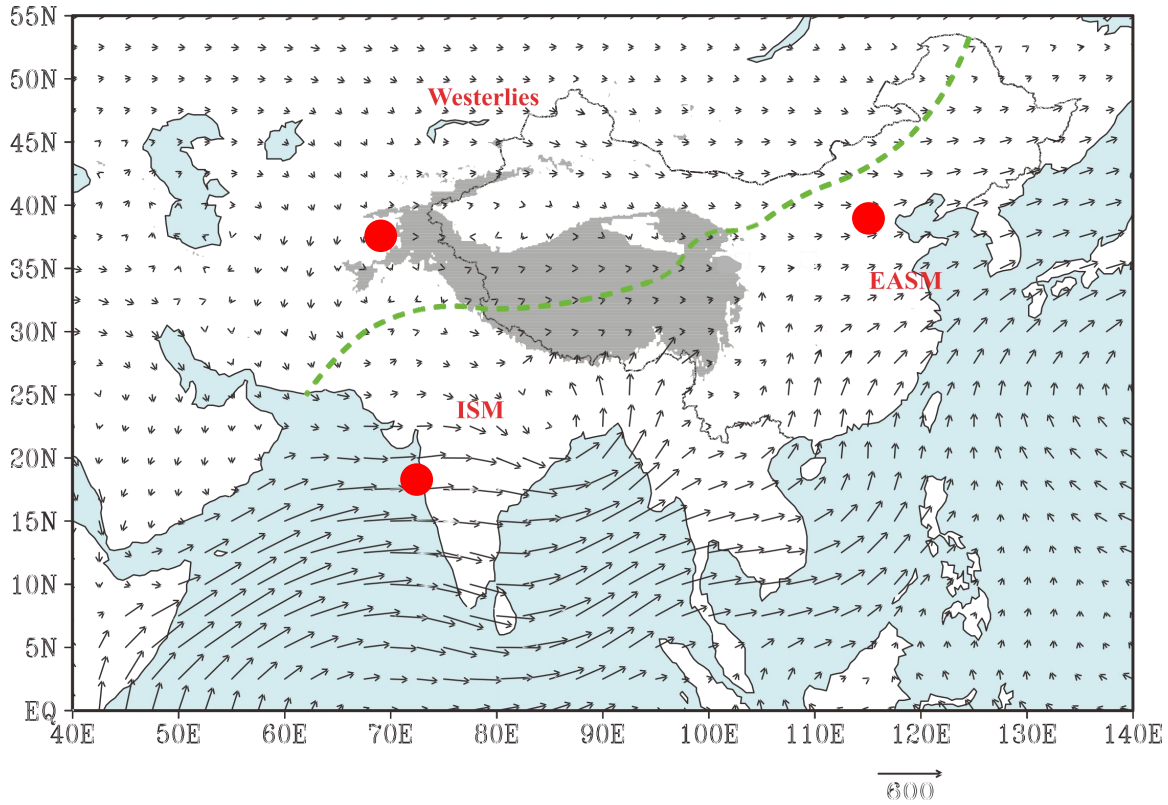
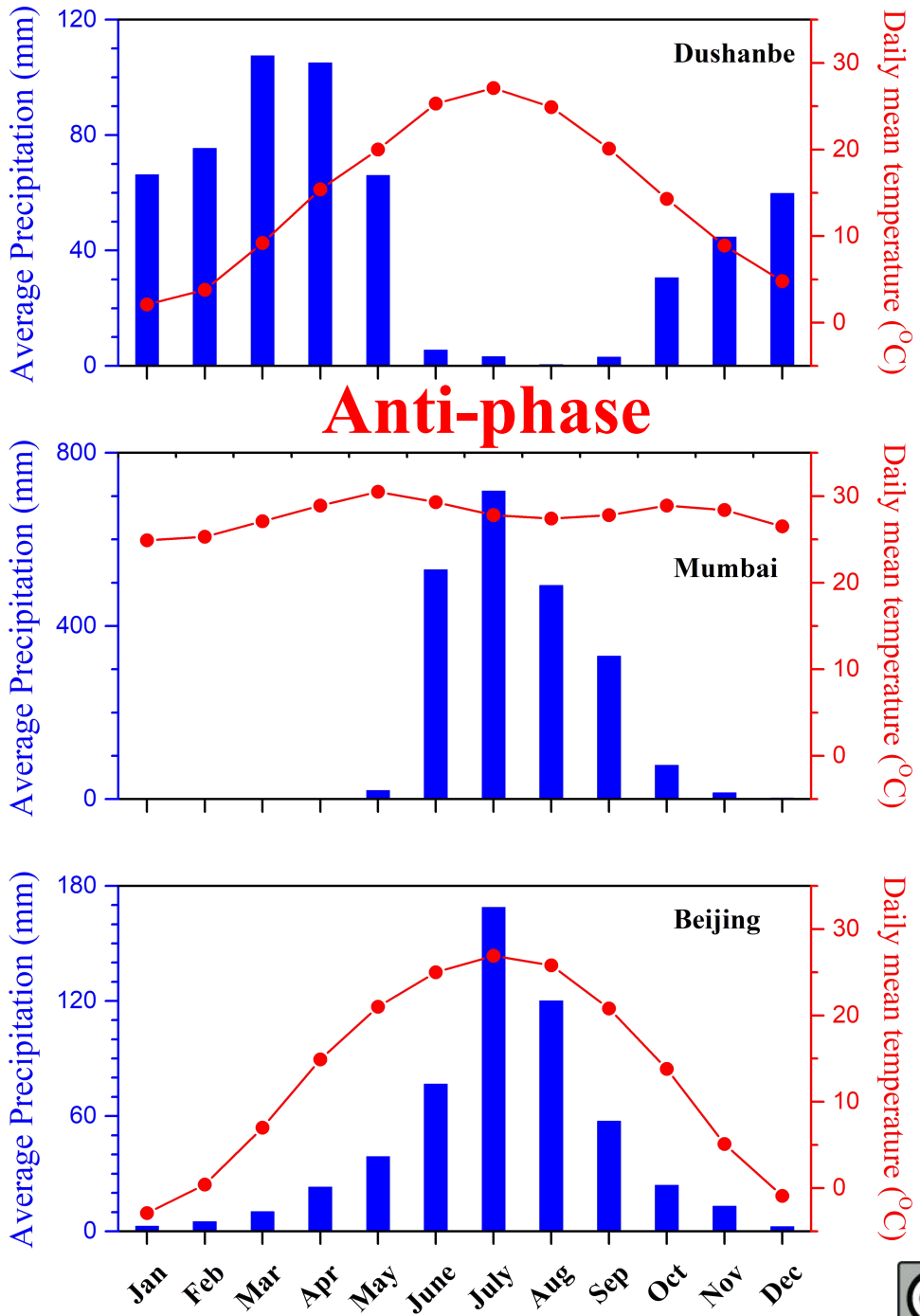

JANUARY
0 20 40 60 80 100 120 140 160 180 200
mm/month


JANUARY
0 20 40 60 80 100 120 140 160 180 200
mm/month

The comparisons of seasonal percipitation between Monsoonal Asia (MA) and arid central Asia (ACA)

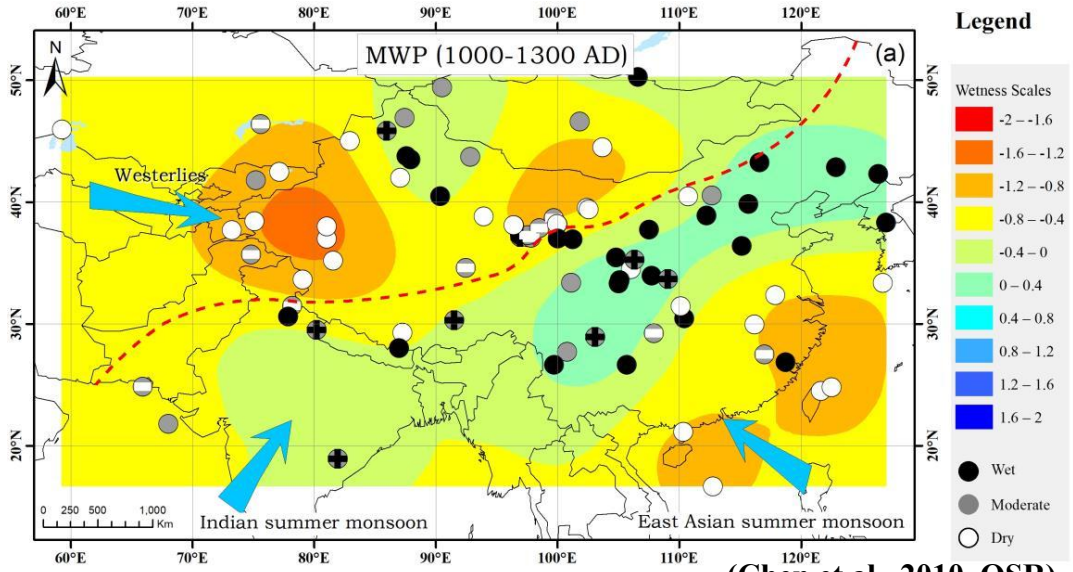




Anti-phase

getting wetter in ACA

getting dryer in MA

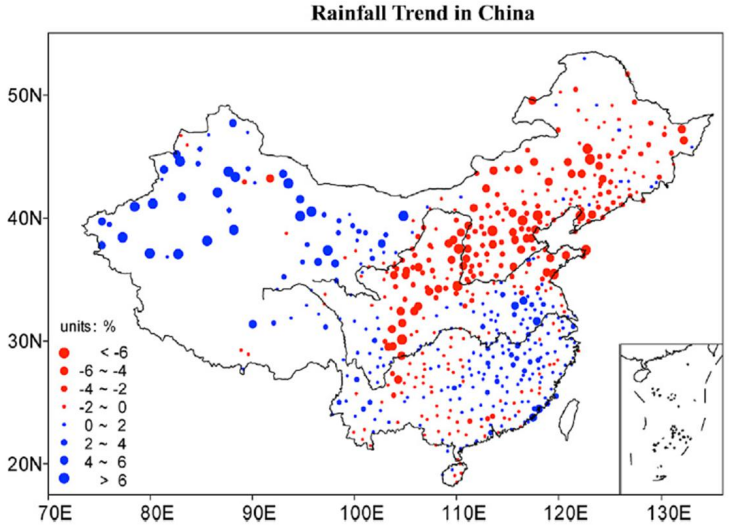


(Chen et al., 2010, QSR)

Anti-phase

out-of-phase

Decadals scale pattern | **Millinnium scale pattern** | **Multi-millinniums scale pattern**

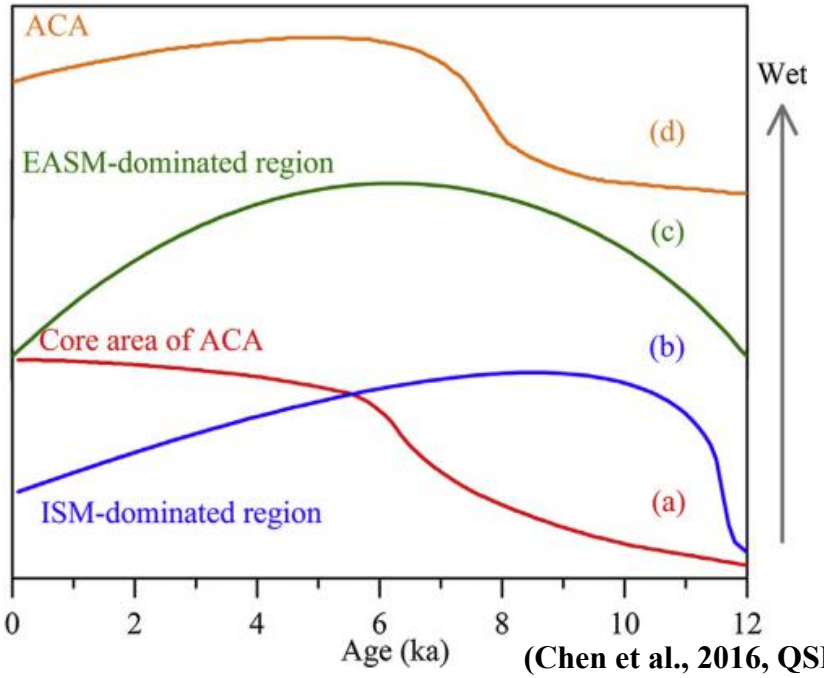


Linear trend of annual rainfall from 1957 to 2007 (in %) in 170 stations across China (Liu et al., 2014)

Anti-phase

getting wetter in ACA

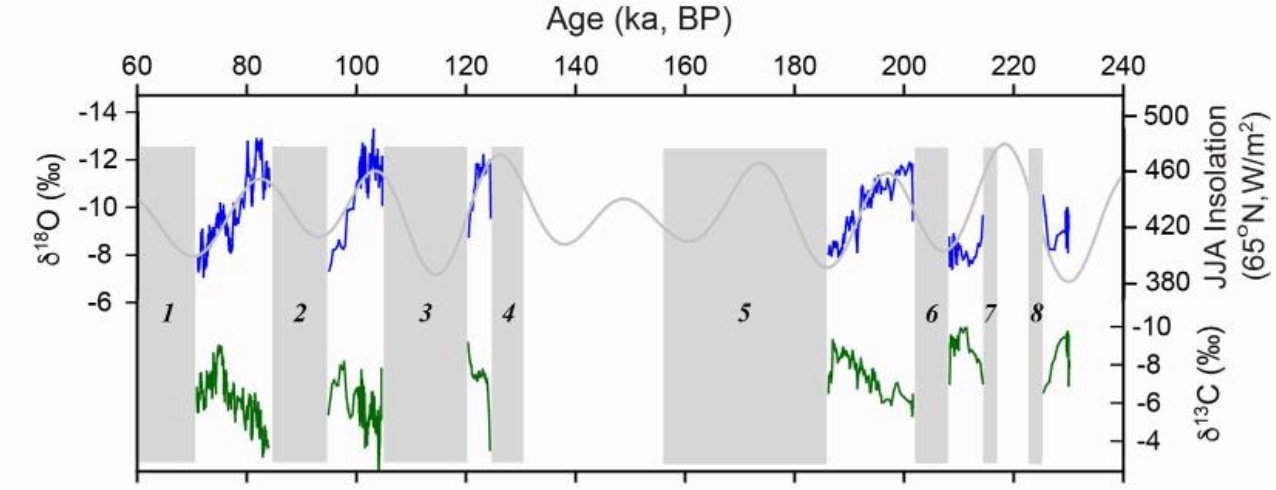
getting dryer in MA



(Chen et al., 2016, QSR)

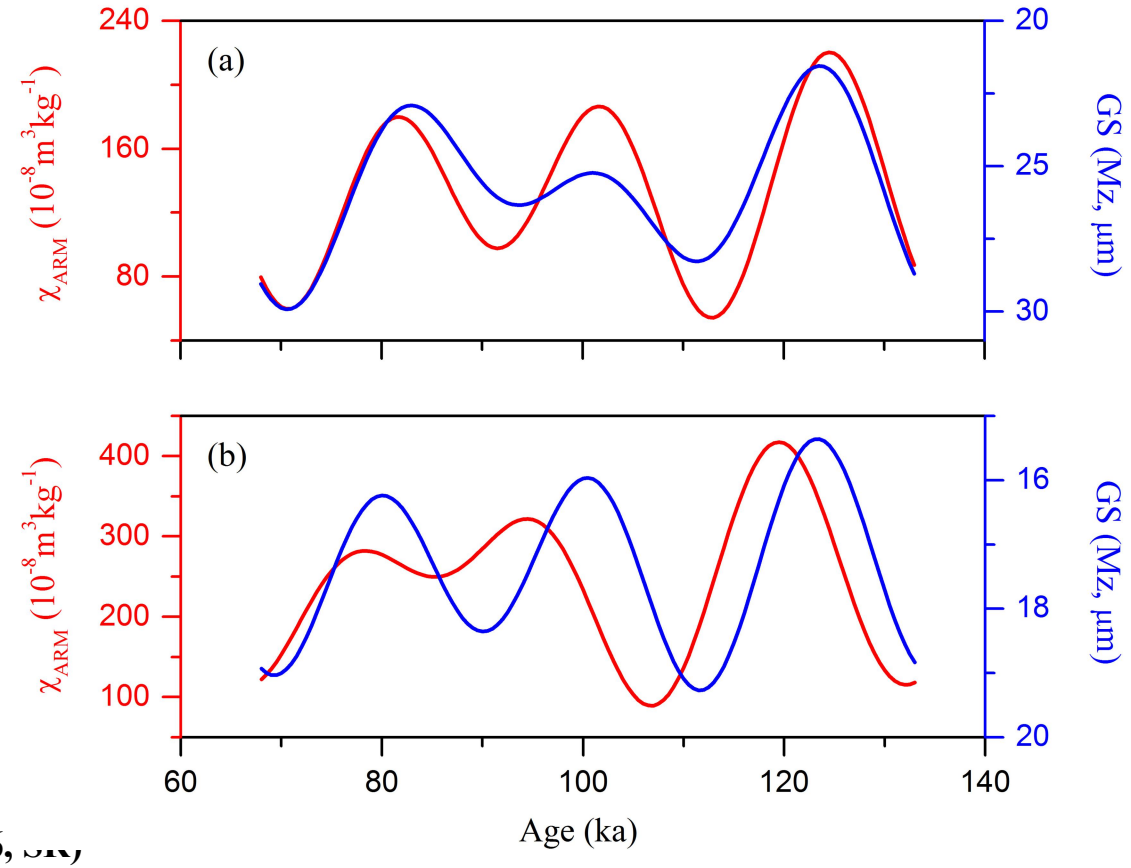
The out-of-phase variations of misture between MA and ACA during last interglaicals

Moisture variations in the ACA lag to those in EASM-dominating region about 3-5 ka .



Stalagmite records the lagged moisture variations in central Asia (Chen et al., 2016, SR)

The comparison of loess records between MA and ACA. Their particle size proxies vary synchronous, but their humidity proxies is not.



(Jia et al., 2018, JQS)

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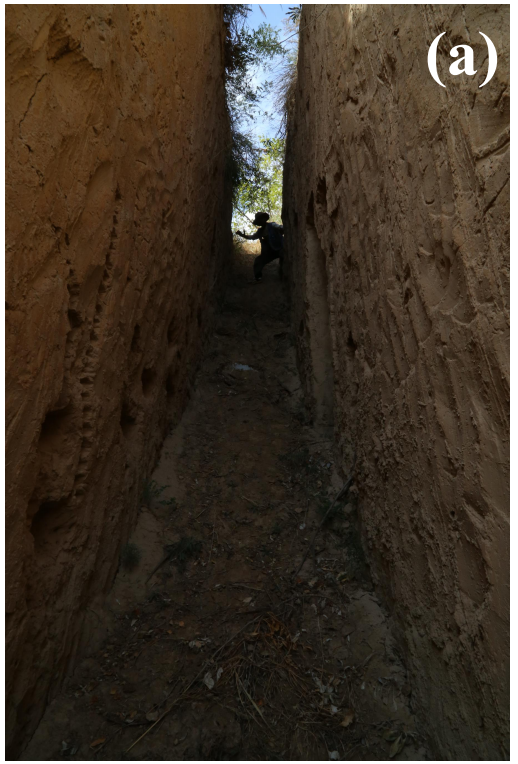
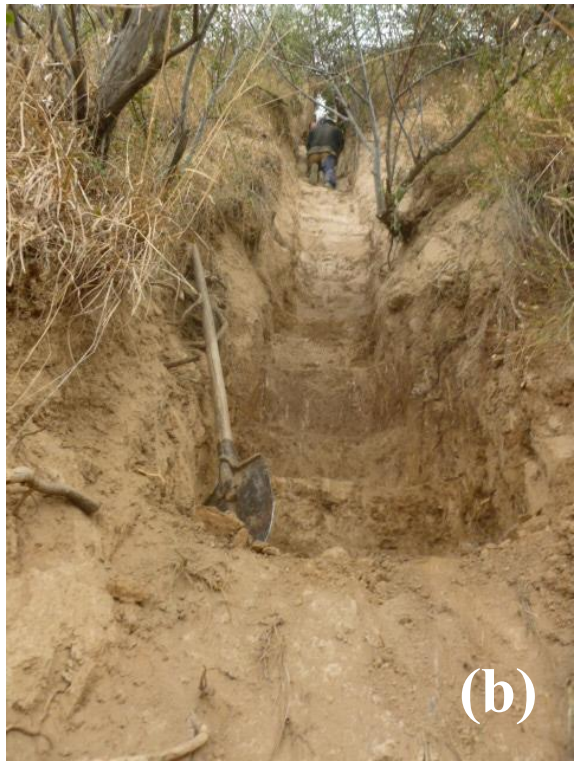
The section

Darri Kalon (DK) section locates in the northeastern part of the Tajik Depression, with a total thickness of 176 m and with 18 loess/paleosol units (Dodonov, et al., 2006).





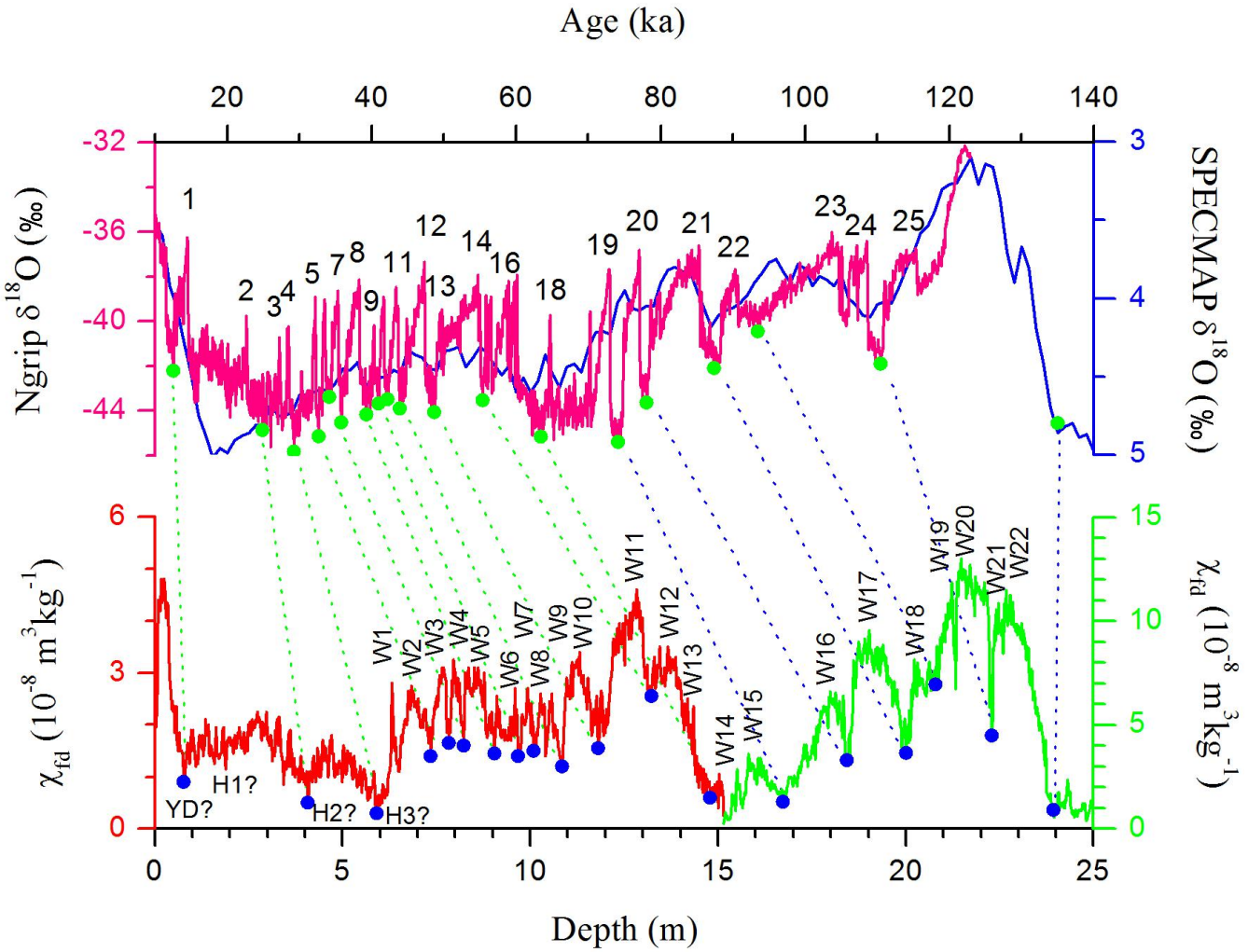
The section is originally dug by German scientists.

a. Segment of last glacial loess

b. Segment of last interglacial paleosol

c. the photo of paleosol S1.

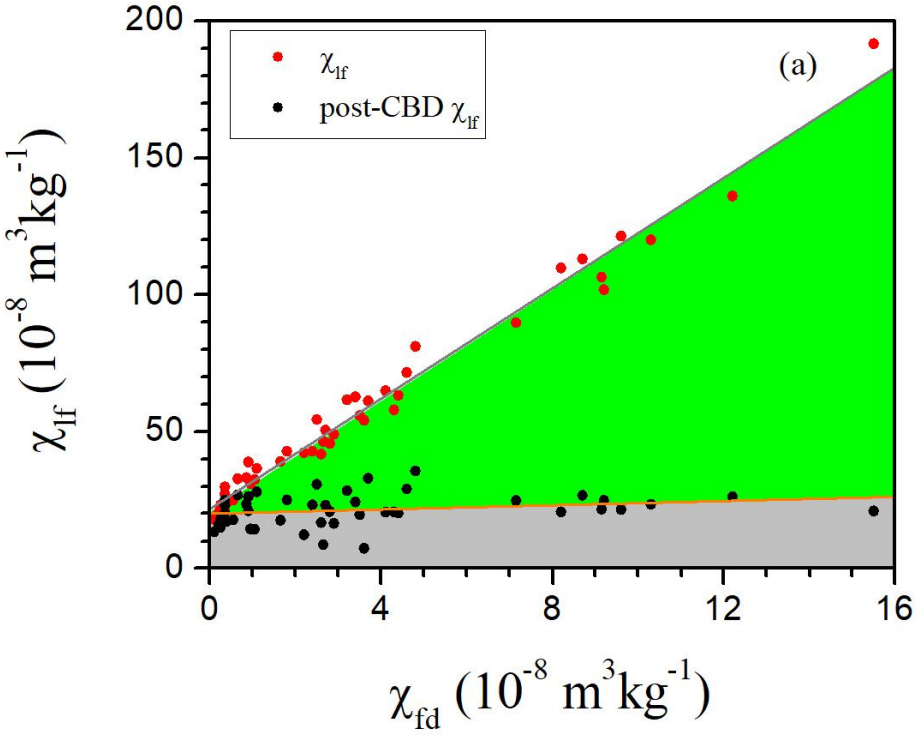
- More than 16 millinnium-scale climate variation events were recorded by magnetic proxy.
- However, the record losts the YD, H1, H2 events, at least. The phenomenon is similar with CLP loess records.

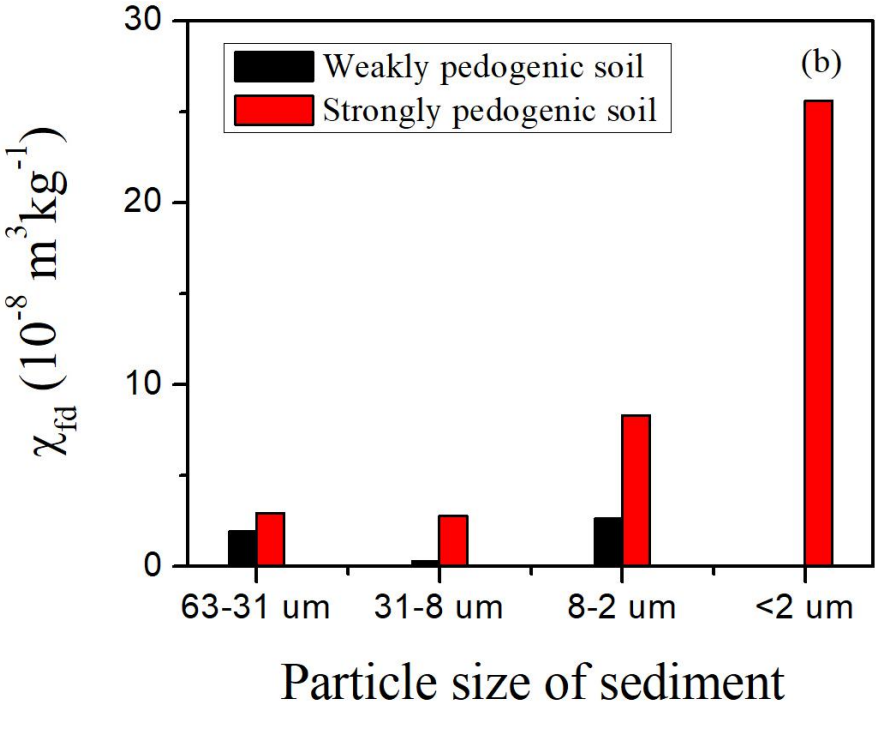


(Jia et al., 2018, GJI)

The clay material contributes the majority of magnetic susceptibility enhancement of soils.

The content of lithological magnetite is low and stable. Their magnetic susceptibility is only about 20-30×10^{-8} m^3kg^{-1}.





(Jia et al., 2018, GJI)

- The moisture variations present almost in-phase pattern between MA and ACA during last glacials.
- The mid-westerlies in arid central Asia made a distinct change during last glacials.
- Our research is still going on……