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Introduction

Climate change is attributed directly or indirectly to human activities. It will affect animal welfare, food production and human health through its short-term and long-term impacts on all components of global and local food systems (FAO 2008).

In general, the projected climate change is foreseen to have a negative impact on food security, especially in developing countries.

In Iran the change and variability of climate elements in every agro-ecological regions are different. Temperature variations are commonly used to detect and quantify possible changes in climate. To assess the influence of temperature variability upon main compounds of milk in the region of East Azerbaijan in Iran, the following points are addressed.

Objective

The aim of this research is to detect the effects of climate variability on the milk components in different regions of Iran. This would allow finding an optimum scenario for minimizing negative effects of climate change on the milk components, such as changing the feed rationing of cows or changes in milk processing.

Data

Milk components: Total fat, total protein and milk yield in about 600 herd stations in whole Iran for the period from 2002 to 2010 in the seasons that cow uses the natural pasture for feeding from April to October.

Climatic data: 2m temperature of NASA MERRA reanalysis for the same period.

Methodology

We performed a regression analysis between milk compounds and 2mT parameter of NASA MERRA.

To treat the research aim, milk yield, fat and protein data from individual cows (>250 cows per station) were gathered in whole Iran for the period from 2002 to 2010 for spring and summer seasons.

The monthly mean of the milk components and 2m temperature of MERRA was calculated from April to October for the period in each station.

Case Study

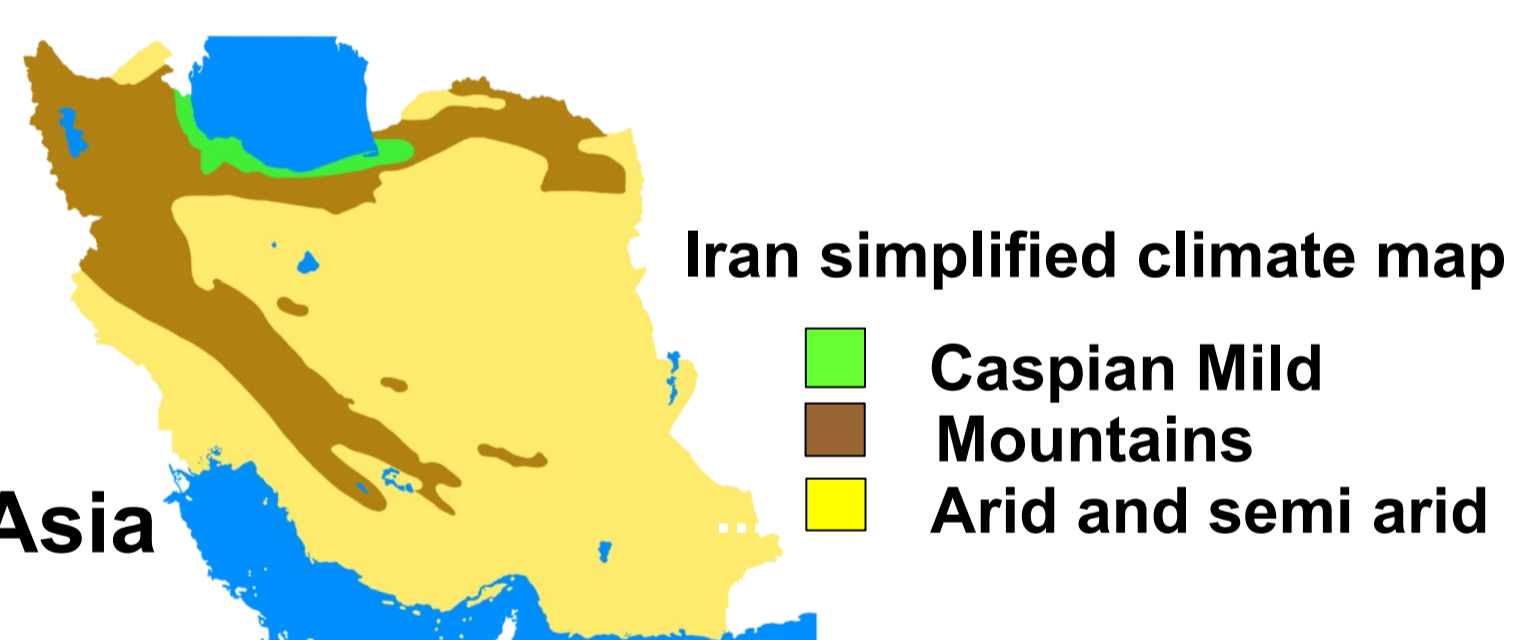
Name: Islamic Republic Of Iran

Place: In central Eurasia and west Asia

Area: The 18th largest country in the world with the area of 1,648,195 km²

Population: Over 75 million

Province: 31



Pilot study in Iran :

Name: East Azerbaijan Province

Latitude: 35 ° – 38.5 ° N

Longitude: 46 ° – 48 ° E

Area: 45,650 km²



Conclusions

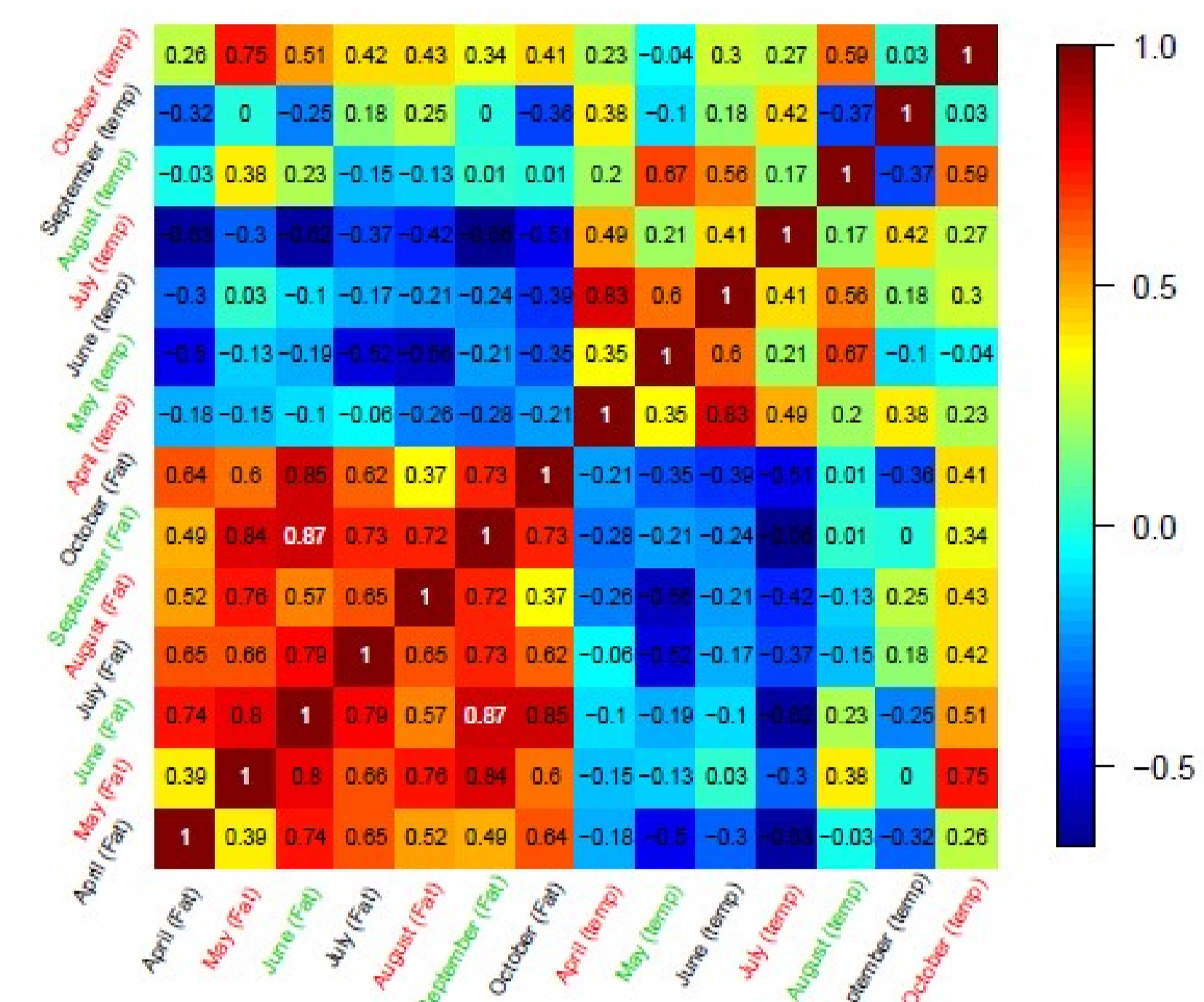
The first result on the preliminary milk data analysis in Northwest of Iran reveals a monomodal probability density of the milk compounds. The results indicate a negative correlation between fat and temperature and no obvious relations between Protein and Milk yield with temperature data.

Outlook

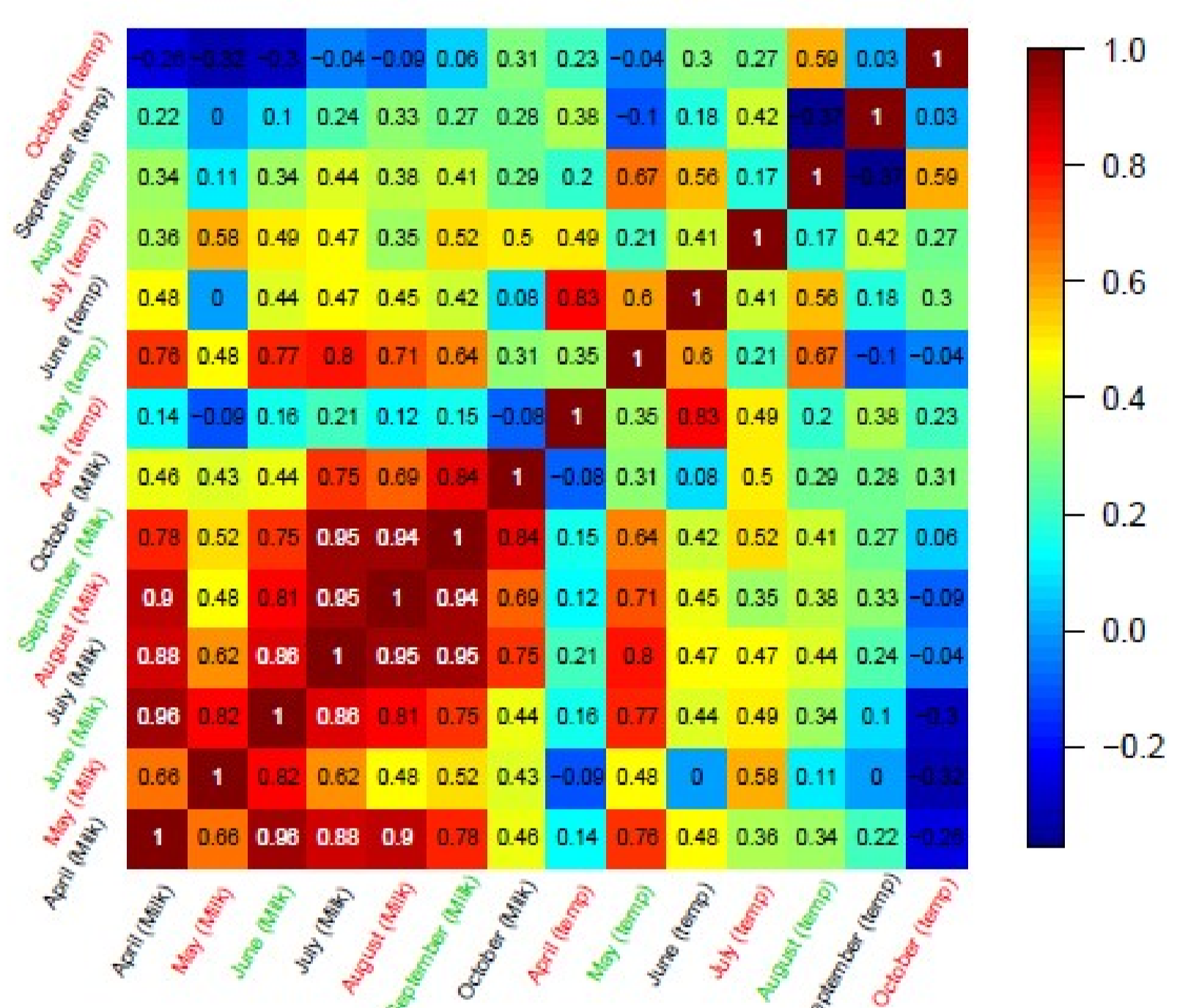
Performing the regression analysis for the other provinces will explain more the relations between milk data set and temperature. The regression modeling will be presented based on the NASA reanalysis MERRA to construct a downscaling model for future use.

Station: East Azerbaijan

Correlation between Fat and Temperature



Correlation between Milk yield and Temperature



Correlation between Protein and Temperature

