

# Changes in Land Cover: Albedo and Carbon Sequestration

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**Climatematch**  
Academy

# Let's learn about climate! (Short Introduction)

- **Land use and land cover change (LULCC)** is increasingly becoming a global concern because of the impact on climate. LULCC affects the climate system through both biogeochemical and biophysical processes. One major biophysical component impacted by this is surface albedo.
- **Albedo is the fraction of solar energy that reflected back into space.** Different parts of the Earth have different albedos, and objects with higher albedos reduce solar energy available to heat the surface and atmosphere.
- Recently, **greenhouse gases in Earth's atmosphere have reduced longwave emission to space**, and energy is trapped which increases the temperature of the Earth's surface and atmosphere.
- **Natural forests and rangelands can reduce atmospheric CO2 concentration** and finally temperature of the Earth's surface and atmosphere by photosynthesis processes. However in agricultural systems, two processes affecting the concentration of atmospheric carbon dioxide gases should be considered. First, the absorption of carbon dioxide by crops and second, the emission of carbon dioxide gas due to the agriculture operations (planting and harvesting, irrigation, and fertilization).
- This scientific research aims to explore the **crucial interplay between land cover alterations and albedo**. By delving into the complex relationship between these factors, we strive to gain valuable insights into their collective role in shaping the Earth's climate and inform effective strategies for mitigating climate change.



# Research questions

- What are the changes of climatic factors in the world and in Iran in the last 20 years?
- In areas with different vegetation index (LAI) and albedo, is the temperature of the earth's surface different?

## Project Hypothesis

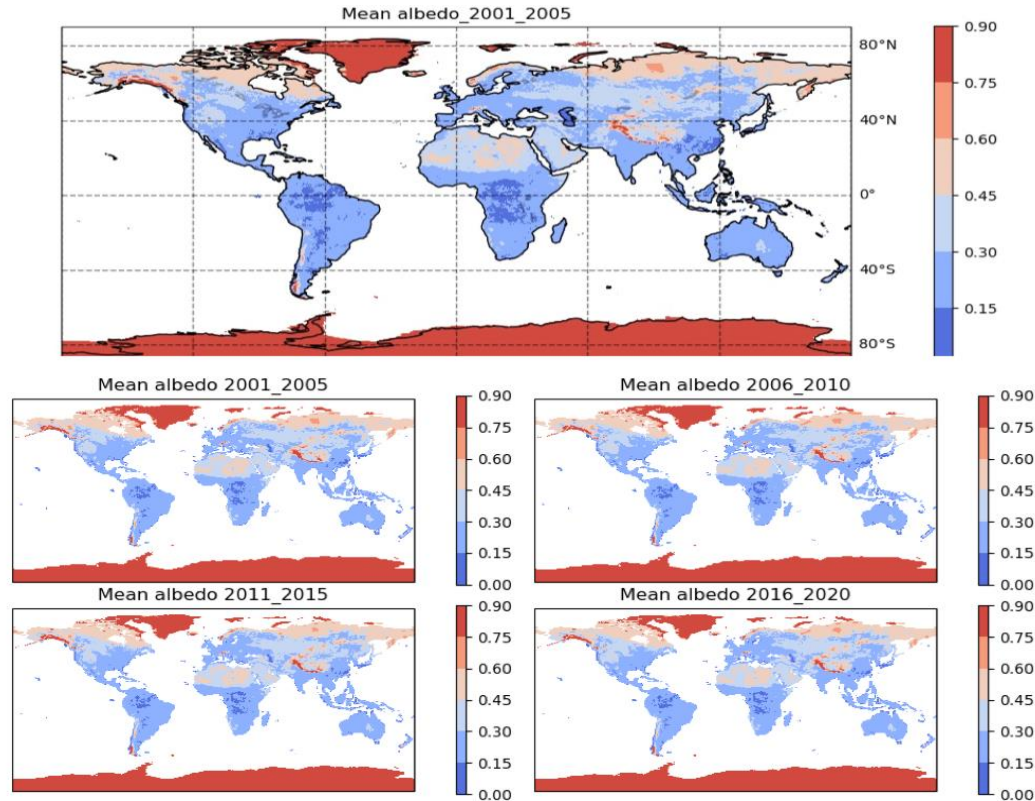
- There is a high correlation among vegetation, albedo and mean air temperature.



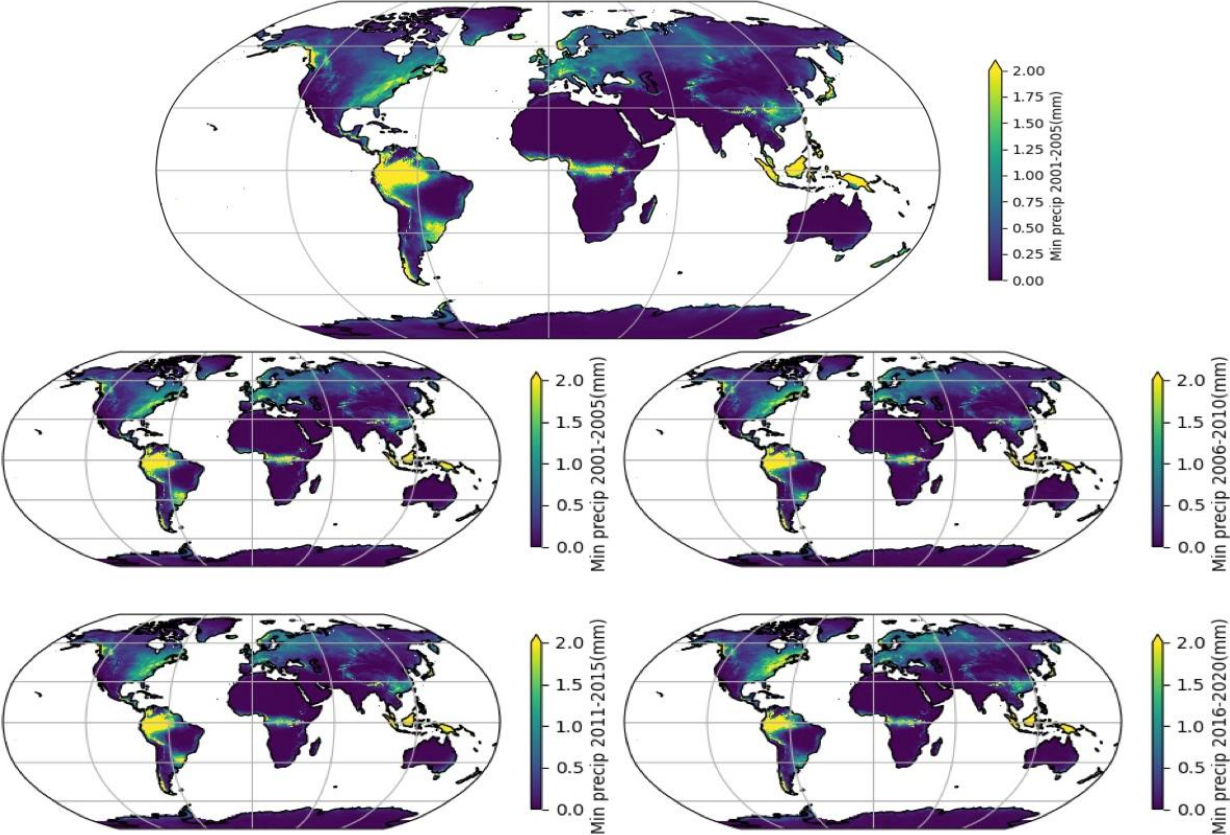


# Results:

## Mean albedo - worldwide (2001-2020)

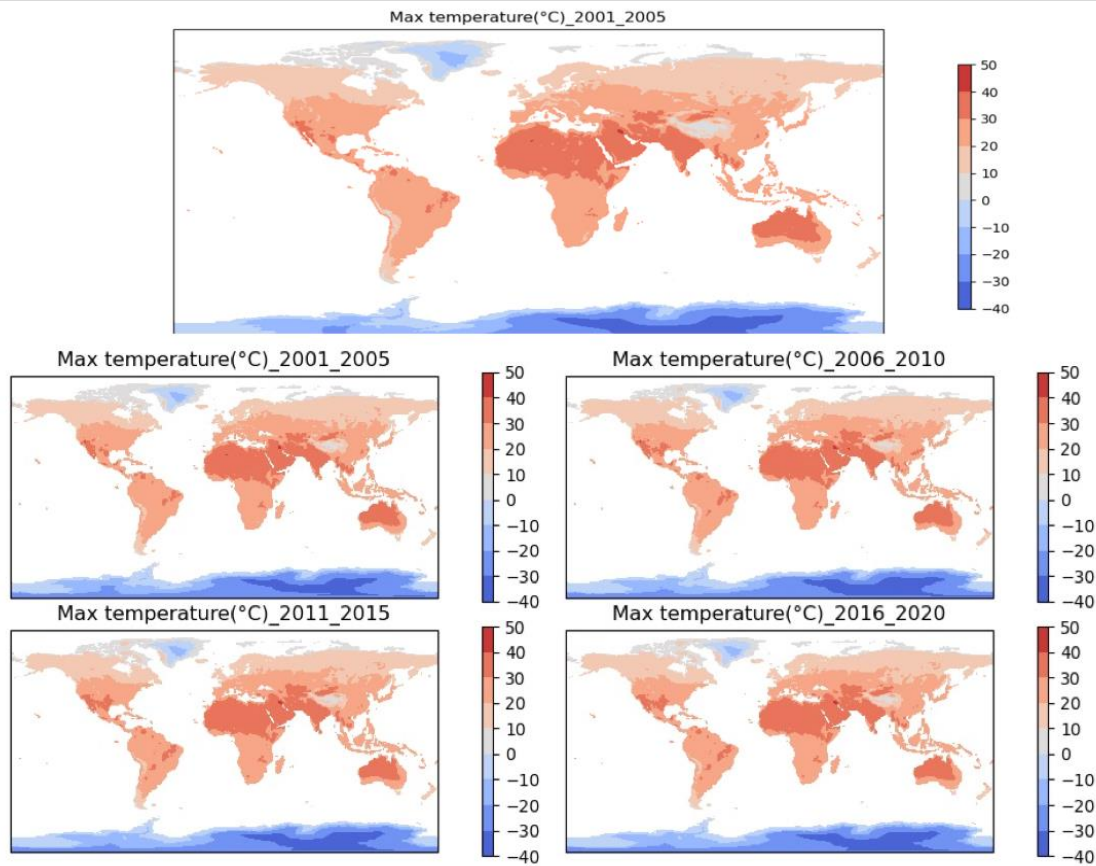


# Min precipitation worldwide (2001-2020)



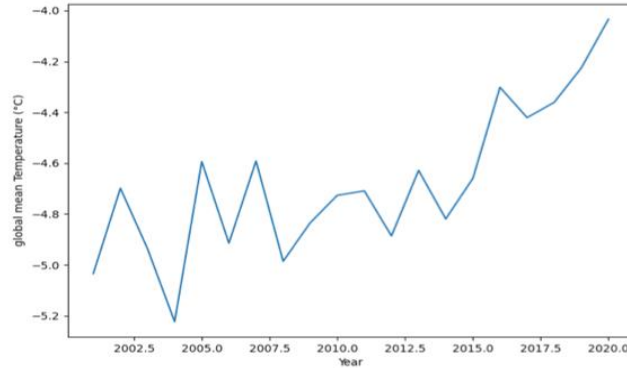
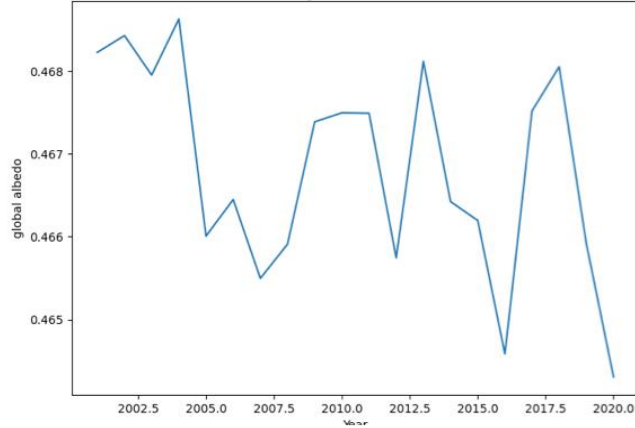


# Max temperature worldwide - (2001-2021)

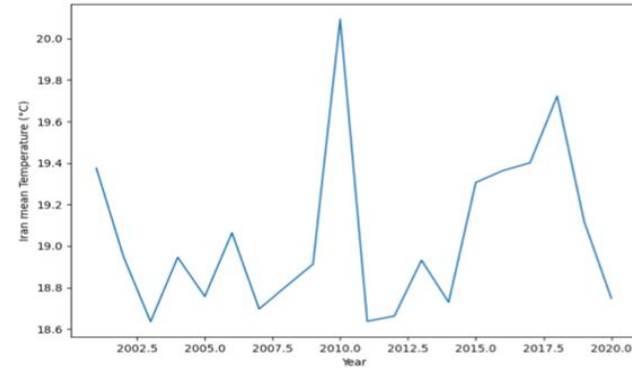
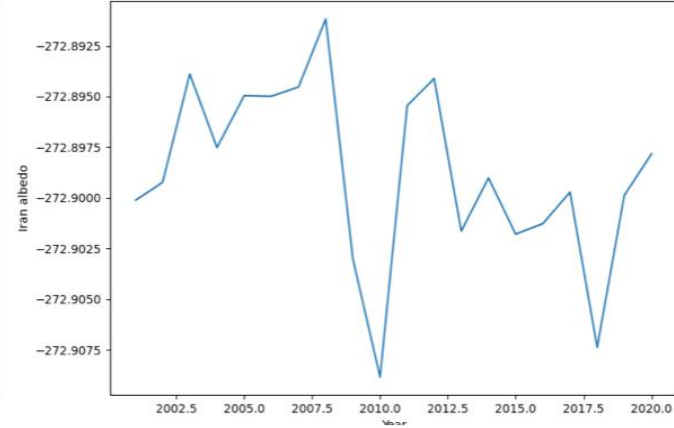


# Trends - Albedo and temperature (Global and Iran)

## Global

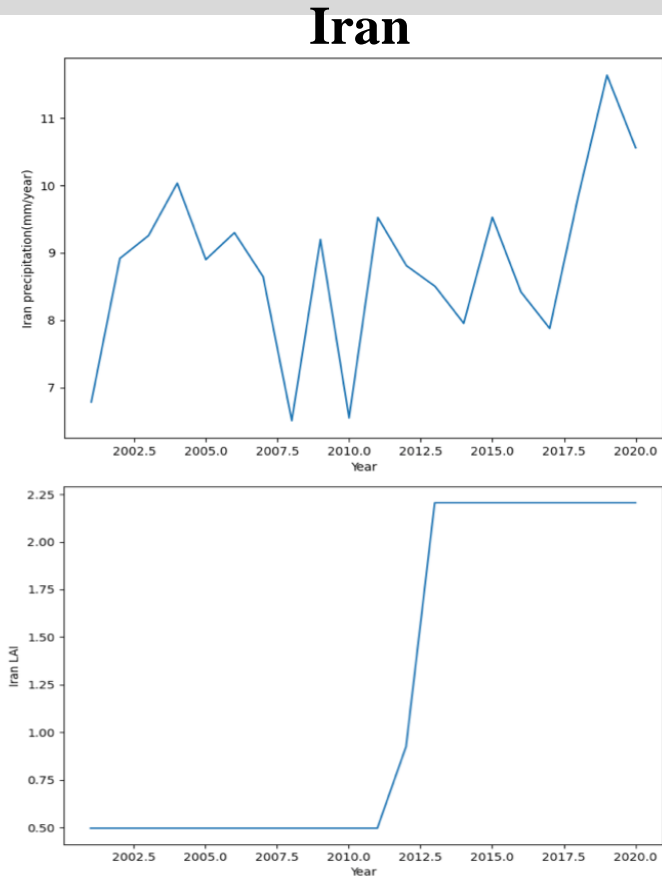
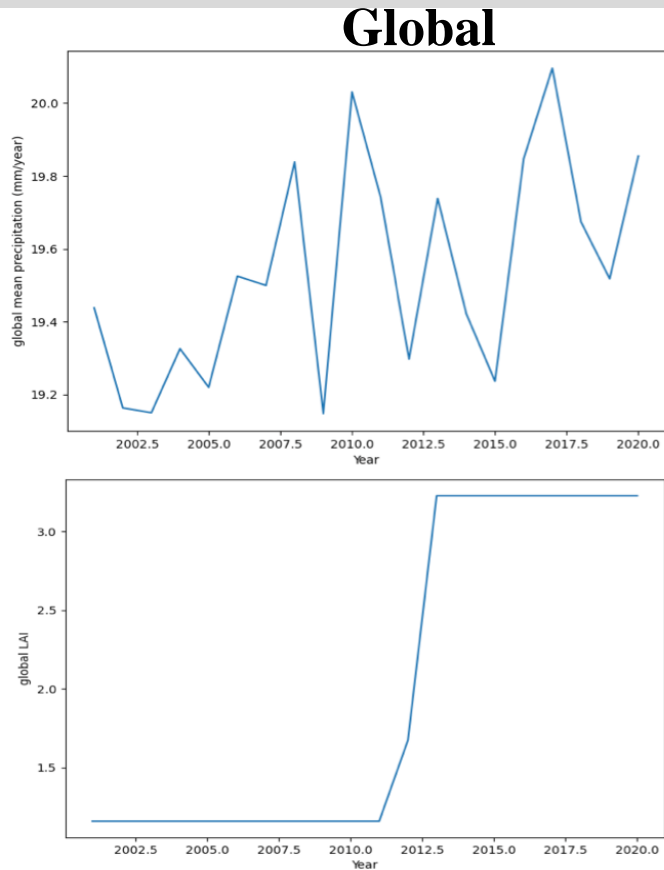


## Iran





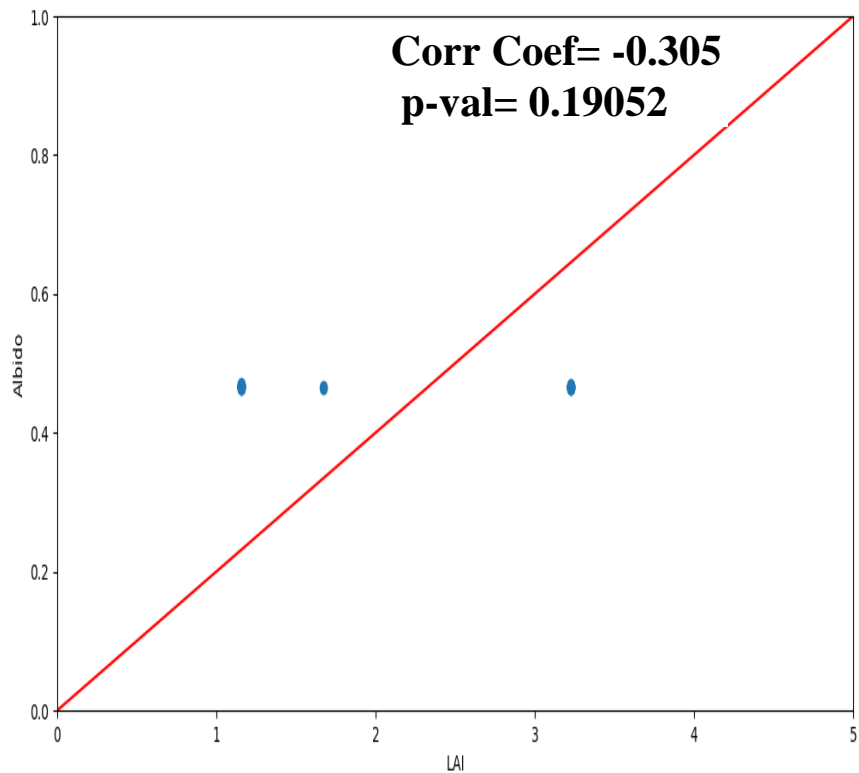
# Trends - Precipitation and LAI (Global and Iran)



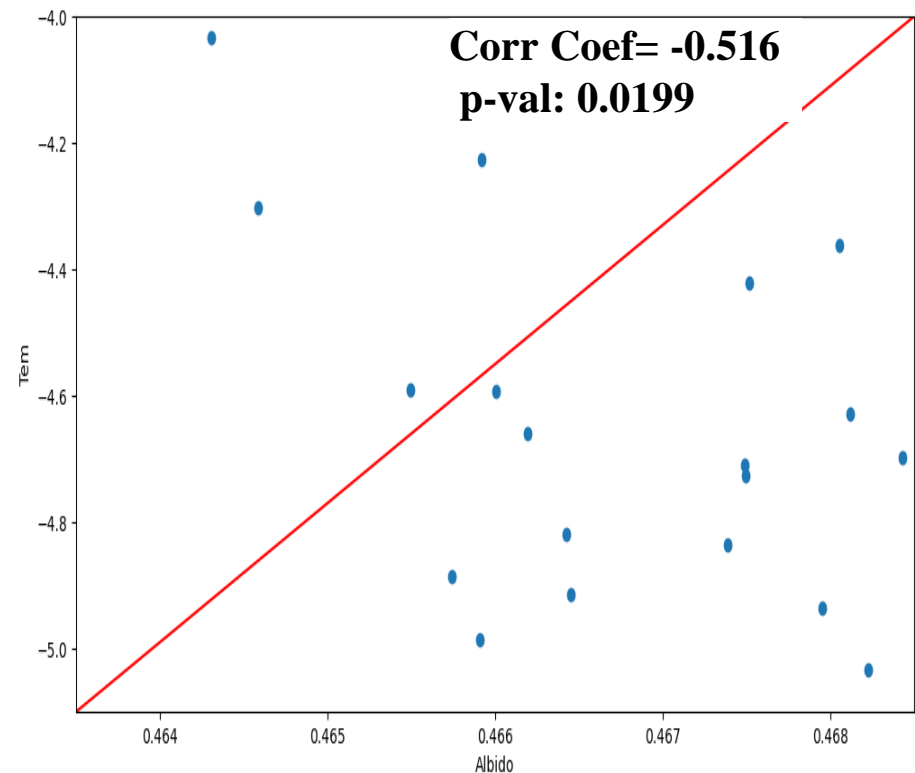
# Regression analysis

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LAI v.s. Albedo



LAI v.s. Albedo



# About team



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# References

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