Directorate General of Educatio
Al Dhahirah Governorate
Alaya Fida Basic Education Sch
(Grades 1-8)

Search for:

Changes in air and soil temperature and rainfall rates between 2018 and 2025 in the Wadi Fida region

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Thanks and appreciation

We extend our sincere thanks and appreciation to the esteemed school principal for her continuous cooperation and unwavering We also thank Ms .GLOBE program team support of the Sheikha Al-Zaidiyah, the team supervisor, for her support and continuous guidance during the preparation of this researchThanks are also due to Ms. Arwa Al-Shamli, the school's geography teacher

Summary

Our research aims to study the changes in air and soil temperatures and rainfall rates over the past six years in the Wadi Fada area and their relationship to .the return of water flow in the Al-Khali area of Wadi Fada

We raised several questions:

Is there a noticeable change in air temperatures in the Wadi Fida area during the ?past six years between 2018 and 2025

Is there a clear change in soil temperatures in the Wadi Fida area during the past ?six years between 2018 and 2025

Is there a change in the rainfall rate between 2018 and 2025 and is it related to the ?flow of water again in the Al-Khali area of Wadi Fada

October and November of 2018 and 2025 were chosen as a sample for the study ,and data extraction on maximum and minimum air and soil temperatures calculating the monthly average and the average daily temperature range. Satellite data were also used and data on the rainfall rate in the region were extracted using NASA Power. Through the analysis of the previous data, we concluded that there is a clear change in maximum temperatures and rainfall rate, as they have increased in the last two years, which has caused water to flow again in the Gulf area near the study site, indicating that the region is affected by the climate change that is .sweeping the countries of the world

we, the students of GLOBE, recommend the necessity of monitoring the , changes in temperatures on an ongoing basis and understanding their impact on the region, and encouraging citizens to preserve the safety of the environment and adopt environmental sustainability projects to reduce the effects resulting from climate change

Search terms

Climate :÷

It is the average weather conditions and atmospheric elements (such as :Climate

temperature, humidity, atmospheric pressure, wind, and rainfall) in a particular area over a long period of time

Maximum temperature

This is the highest temperature recorded during a 24-**:** Maximum temperature hour period and usually occurs in the afternoon, between 2 and 4 pm, because the earth continues to absorb heat until it reaches its maximum warmth

Minimum temperature

It is the lowest temperature recorded during the same**:** Minimum temperature ,hour period and usually occurs in the early morning hours, before dawn-24 when the temperature drops to its lowest levels

Daily temperature range

It is the amount of difference between the**:** The temperature range maximum and minimum temperatures and gives an idea of the extent of daily temperature variation. It is important in climatic, agricultural and health studies

Precipitation rate: It is a measure of the intensity or amount of precipitation (rain, snow, hail) falling in a specific area during a specific time unit. This rate helps meteorologists determine the intensity of precipitation and classify it from light to heavy, and it is essential for weather forecasting and water hydrology

The introduction

The world is witnessing climate change, which is observed through changes in temperature, rainfall, and changes in its timing and amounts, which may lead to different environmental phenomena that require humans to adapt to them and reduce their effects on their lives

have shown that the climate of the Sultanate of Oman has witnessed a rise in temperatures over the past thirty years, and this rise has reached more than 1.2 degrees as an average increase. Likewise, minimum temperatures have witnessed a clear rise in several places in the Sultanate of Oman, and the highest minimum temperature in the world was recorded in Qurayyat several years agoreaching 41 degrees Celsius

have begun to appear through several phenomena, the first of which is an increase in the number of tropical storms that have formed in the Arabian Sea some of which have affected parts of the Sultanate of Oman. The Arabian Sea has recorded an increase in the number of tropical storms over the past 15 years compared to the Bay of Bengal , although the Bay of Bengal was previously the most active

One of the extreme aspects of the climate in the Sultanate of Oman is the appearance of huge thunderclouds, which lead to rapid and heavy rainfall in a very short time. An example of this is what happened in 2024 in the states of Al-Mudhaibi and Wadi Bani Khalid, where very high amounts of rain fell, reaching millimeters in one hour, which is equivalent to the annual rainfall of the 93 Sultanate of Oman. This rapid and strong rainfall leads to the occurrence of floods and severe landslides

The Sultanate of Oman is working on Implementation Many From Projects Adaptation With Changes Climate , including System Warning early and systems Protection From Floods , construction Resilient and sustainable cities , in addition to Expansion In Adoption Solutions The list In nature

The transformation Climate change is a major economic and development opportunity , as investments in clean energy, sustainable infrastructure, and climate intelligence have become the engines of growth in the 21st century

Research questions

Is there a noticeable change in air temperatures in the Wadi Fida area during the past six years between 2018 and 2025

Is there a clear change in soil temperatures in the Wadi Fida area during the past six years between 2018 and 2025

Is there a change in the rainfall rate between 2018 and 2025, and is it related to the flow of water again in the Al-Khali area of Wadi Fada

Hypothesis

There is a rise in temperatures in the Wadi Fida region between 2028 and 2025

There is a relationship between rising temperatures and rainfall rates, as higher temperatures lead to increased rainfall in some months, resulting in the return of water flow in the Al-Khali area of Wadi Fida

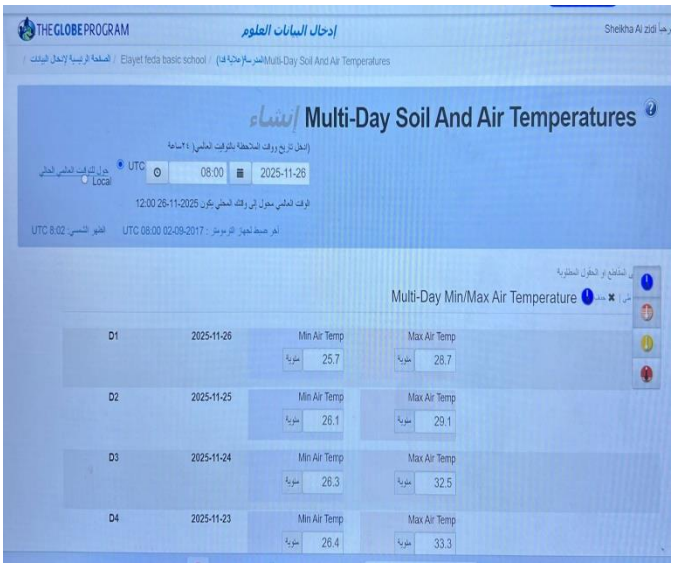
Research plan

Execution date	port	Tools	procedure
– October November	Globo team students at the school	Atmospheric - Protocol Tools - Protective Box Digital Thermometer A laptop connected to the internet Excel program Satellites (NASA (Power website	Monitoring air and soil temperatures for October and November
December	Sheikha Sultan		Data were extracted from the GLOBE environmental program's international website regarding maximum and minimum air temperatures observed by the school's GLOBE team in October and November of 2018 and .2025
December	Sheikha Saeed		Place the previous data ,into Excel spreadsheets analyze it, and calculate .the average
December	Sheikha Sultan		Use NASA Power to extract data on rainfall rates in the research area during the specified period and place it in an Excel .spreadsheet
January	Sheikha Sultan Sheikha Saeed		Comparing previous data to arrive at the desired results

Study location

Study location: Sultanate of Oman, Al Dhahirah Governorate, Dhank Wilayat, Wadi Fida Village
Longitude 56.32
Latitude 23.31
Height 502 m
The temperature in Dhank Governorate ranges between 30-35
The prevailing climate is arid desert
The application was carried out from October to December using the Atmospheric Protocol.

Data entry into the international site (Atmospheric Protocol)



Data

Daily air temperatures for October and November 2018 and 2025, which were monitored by the Atmospheric Protocol and the instruments at the school, were extracted from the international site and the average maximum, minimum and range temperatures were calculated as shown in the table

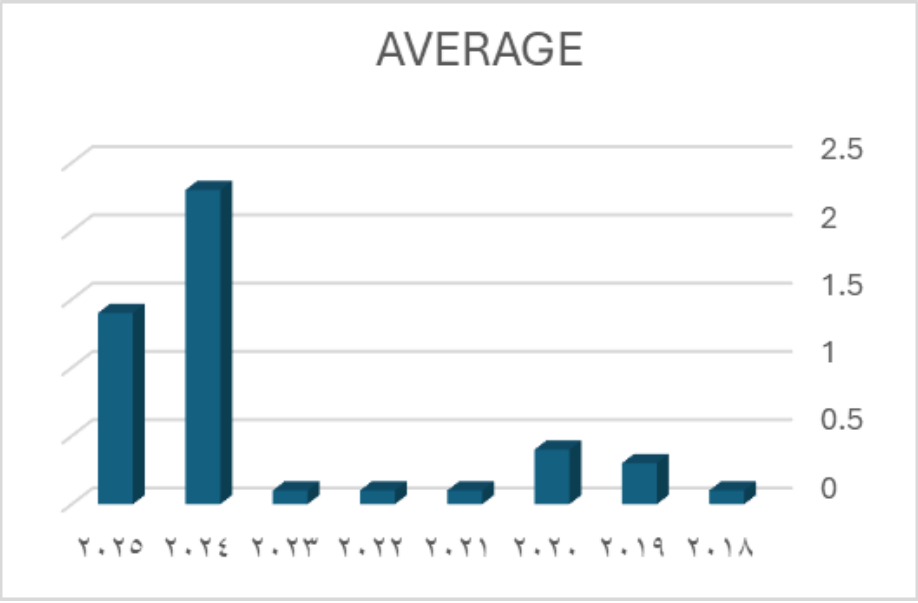
data 2025		data 2018		Data
November	October	November	October	
13,19	20,49	14,74	21,36	Average minimum temperature (degrees (Celsius
36,58	42,85	34,87	40,82	Average maximum temperature (degrees (Celsius
23,39	22,3	20,13	19,46	Daily temperature range (degrees Celsius)

Data were extracted from the international GLOBE website regarding the daily minimum and maximum soil temperatures for the same months

data 2025		data 2018		Data
November	October	November	October	
26,1	30,5	19,9	25,9	Average minimum temperature (degrees (Celsius
38,6	41,4	33,3	41,9	Average maximum temperature (degrees (Celsius

Rainfall rate data for the region between 2018 and 2025 were extracted using NASA Power, as shown in the table

Rainfall rate	YEAR
0.1	2018
0.3	2019
0.4	2020
0.1	2021
0.1	2022
0.1	2023
2.3	2024
1.4	2025



Data and results analysis

Using data collected through atmospheric protocol instruments, historical international site data from the past six years, and NASA Power site data, and after statistical processing, we found that

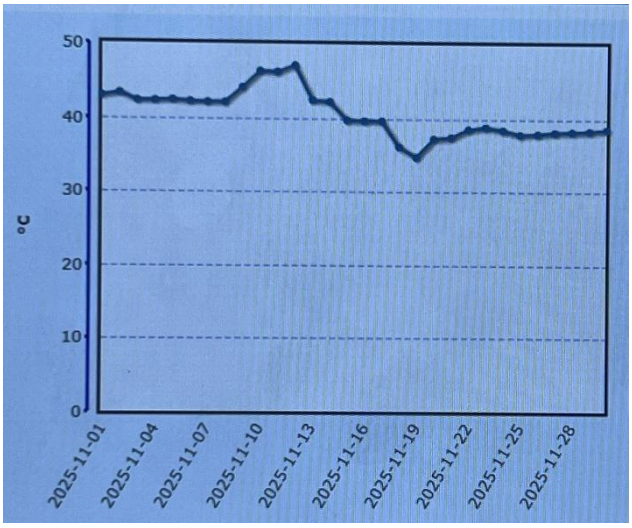
There is a clear change in maximum and minimum air and soil temperatures between 2018 and 2025

We note an increase in maximum air temperatures, which has led to an - increase in the daily temperature range. This indicates that a change in the region's .climate has begun recently

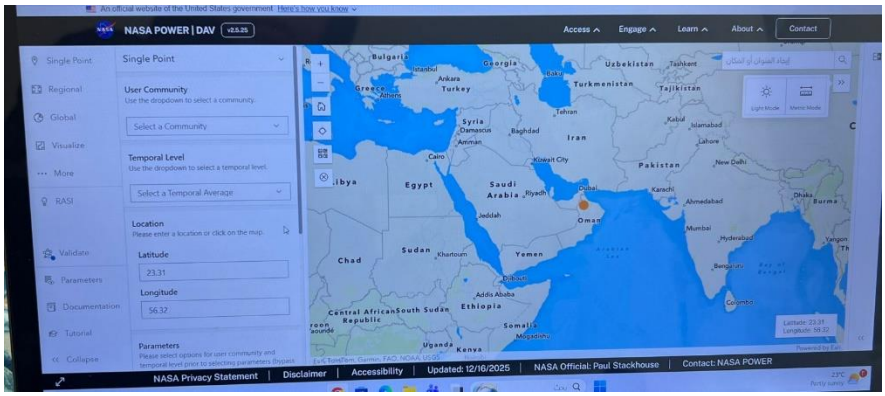
We observe an increase in maximum and minimum soil temperatures between 2018 and 2025

We have noticed an increase in rainfall rates in the last two years compared to - what they were 6 years ago, and this is due to the change in temperatures

The difference in rainfall rates and the existence of months with heavy rainfall led to the return of water to the Al-Khali area in Wadi Fida after it had been cut off for years

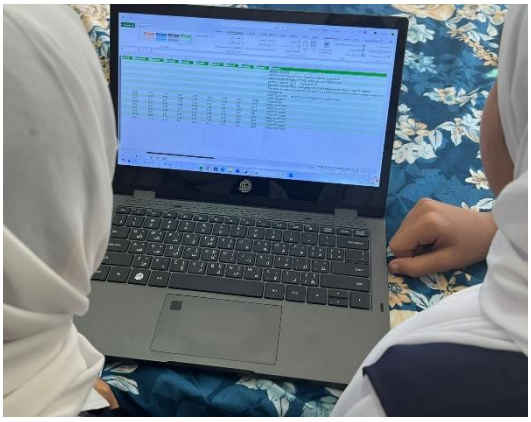


Description of badges



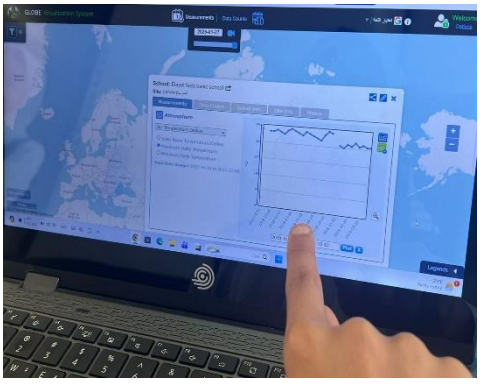
I work in the field of satellite data

We have worked to take advantage of satellites, as we used the NASA Power 2025 site to extract research data such as rainfall rates for the years from 2018 to We also compared temperature data with atmospheric protocol data that we have included in the GLOBE International website

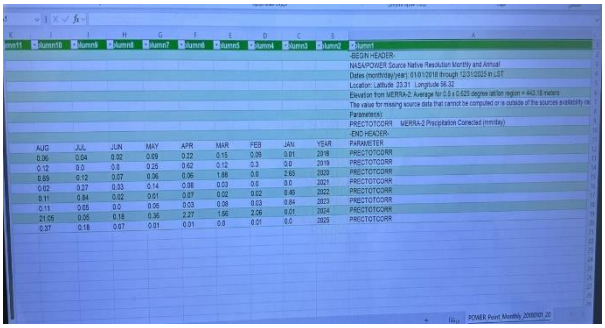


I am a data scientist

As data scientists, we extracted historical data Visualize Data, from the international website specifically the maximum and minimum air and soil temperatures for 2018, and the same .data for 2025



We then used Excel and toCopilot analyze the data, obtain .averages, calculate ranges, and create charts and graphs



I Make an Impact

Our research addressed an important issue: the change in temperatures and its impact on rainfall .patterns in our region, mirroring global changes We concluded that it is essential to focus on environmental sustainability to mitigate the risks associated with temperature changes

Recommendations

1. Raising awareness among citizens about the necessity Paying attention to the environment and reducing pollution that increases ,the phenomenon of global warming by reducing waste, recycling it using environmentally friendly materials, and not burning farm .waste but disposing of it in other ways
2. We urge the municipality to relocate the existing landfill in the area to a more distant location and to implement environmentally .friendly initiatives that promote environmental sustainability
3. The government is adopting an award for environmental sustainability projects to encourage citizens to protect their .environment, such as the Sustainable Neighborhood
4. The school is adopting a project to treat and recycle waste within the school

Conclusion

We thank God Almighty for completing this research despite all the difficulties we faced, and we will continue to work on the GLOBE program protocols to extract more information and data that are important to our environment and help us understand the change that is taking place in it so that we can adapt to all the changes and protect our environment from any potential harm in the future

The reviewer

https://climateknowledgeportal.worldbank.org/general-resources

https://www.ea.gov.om/ar/media-center/media-news/news

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