

Comparing Croatia's Short Grass Surface Temperatures to Navarre's

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**Navarre Elementary, Toledo, Ohio
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Purpose: We chose to compare surface temperatures to are school Navarre Elementary Toledo, Ohio with a school in Croatia

Essential Question : How do Croatia grass surface temperatures compare with Navarre?

Hypothesis : We are at similar latitude north of the equator so I think the temperatures will be about the same.

Investigation Plan

- 1. Take surface temperatures and cloud data at our school sites**
- 2. Upload data to Globe website**
- 3. Determine our research questions and locations to investigate**
- 4. Compare data with another school (Croatia)**
- 5. Research school ecosystems and climates**
- 6. Compare Data**
- 7. Determine Errors**
- 8. Write Conclusions and abstract**

Research: Navarre Elementary, Toledo Ohio

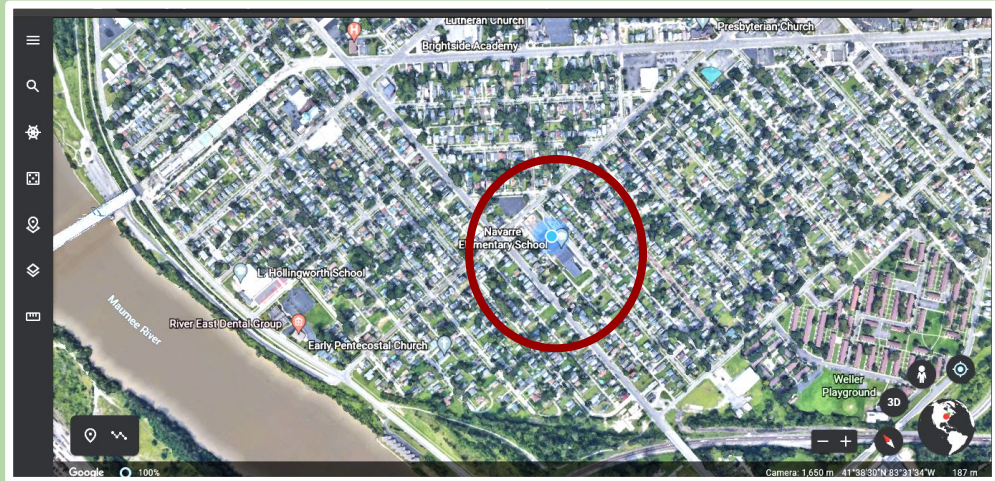
Latitude: 41.63458

Longitude: -83.5243

Elevation 186 m

Population: Urban

Climate: Temperate



Research : OS Banija, Croatia

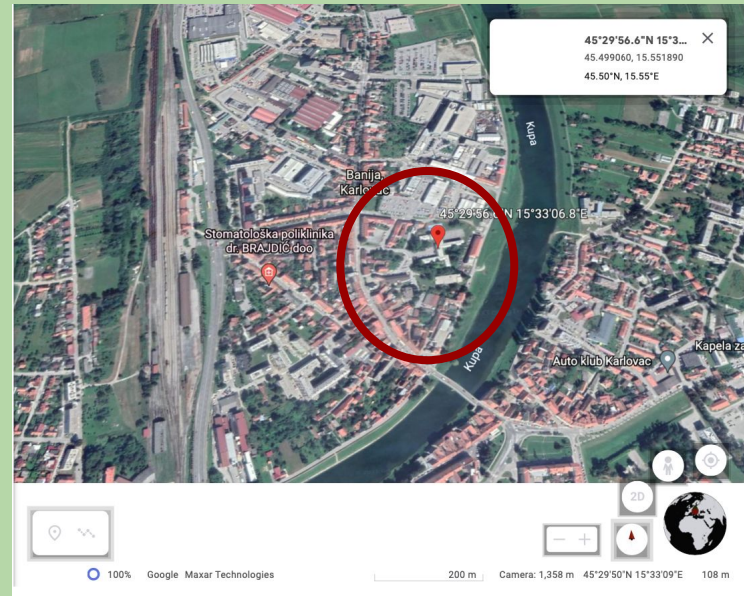
Latitude : 45.4992 N

Longitude : 15.5517 E

Elevation : 126 meters

Population: Suburban

Climate: Temperate



Field Research Methods / Protocols

Surface Temperatures & Cloud Observations

- 1. Data Sheets - Write down data from the samples**
- 2. Air Thermometer - Hang the thermometer in a tree**
- 3. IRT Infrared Thermometer - Take temperature samples of surfaces by pointing the IRT to the ground or surface (asphalt, cement, grass)**
- 4. Upload data to GLOBE website**
- 5. Collect cloud data by taking pictures and cloud identification**

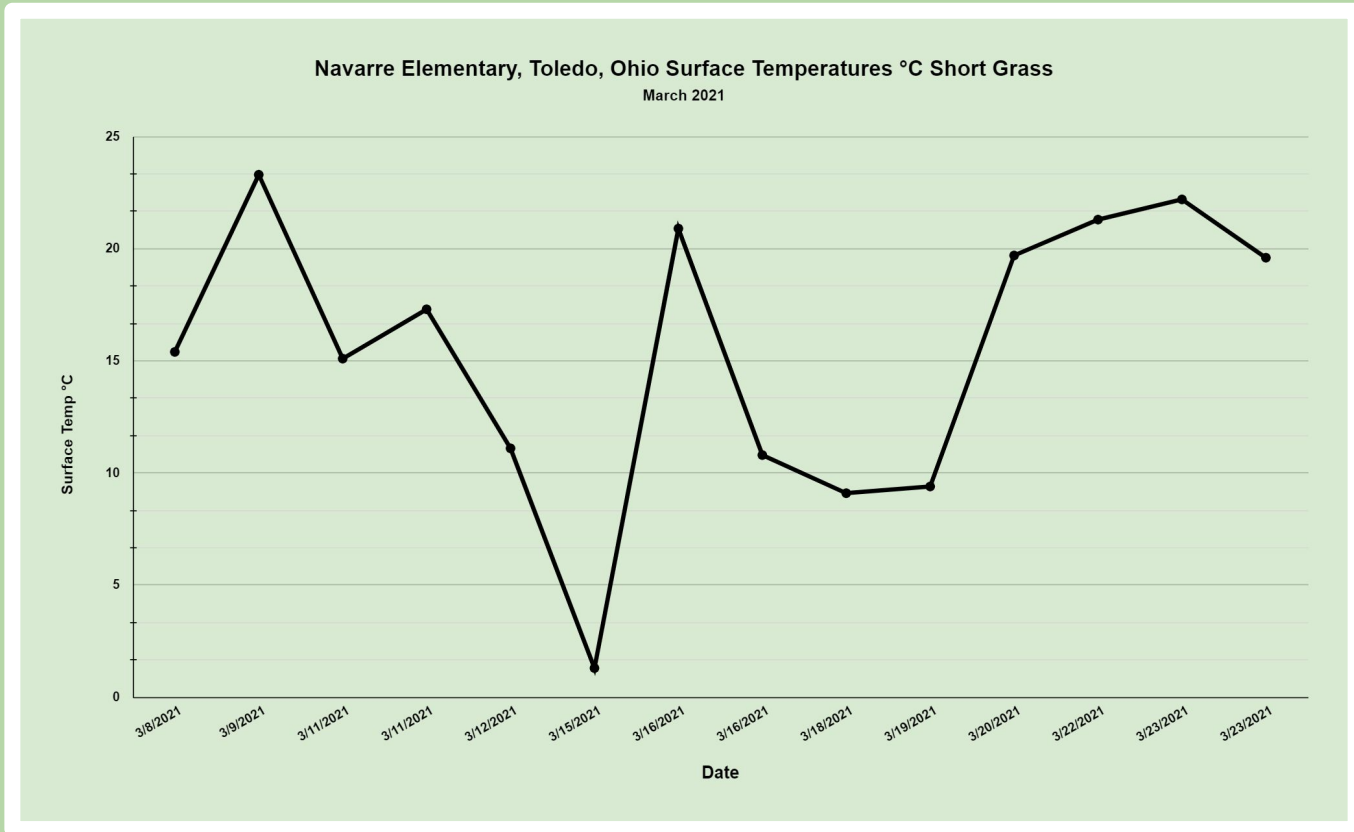
Data Table: Navarre Elementary, Toledo, Ohio

site_name	latitude	longitude	elevation	Date	Surface Temp °C
Navarre Grassy Area East of Building	41.63458	-83.5243	186	3/8/2021	15.4
Navarre Grassy Area East of Building	41.63458	-83.5243	186	3/9/2021	23.3
Navarre Grassy Area East of Building	41.63458	-83.5243	186	3/11/2021	15.1
Navarre Grassy Area East of Building	41.63458	-83.5243	186	3/11/2021	17.3
Navarre Grassy Area East of Building	41.63458	-83.5243	186	3/12/2021	11.1
Navarre Grassy Area East of Building	41.63458	-83.5243	186	3/15/2021	1.3
Navarre Grassy Area East of Building	41.63458	-83.5243	186	3/16/2021	20.9
Navarre Grassy Area East of Building	41.63458	-83.5243	186	3/16/2021	10.8
Navarre Grassy Area East of Building	41.63458	-83.5243	186	3/18/2021	9.1
Navarre Grassy Area East of Building	41.63458	-83.5243	186	3/19/2021	9.4
Navarre Grassy Area East of Building	41.63458	-83.5243	186	3/20/2021	19.7
Navarre Grassy Area East of Building	41.63458	-83.5243	186	3/22/2021	21.3
Navarre Grassy Area East of Building	41.63458	-83.5243	186	3/23/2021	22.2
Navarre Grassy Area East of Building	41.63458	-83.5243	186	3/23/2021	19.6

Data Table ,OS Banija, Croatia Grass

site_name	latitude	longitude	elevation	Date	Surface Temp °C
KUDICA - SKOLA BANJA - KARLOVAC.ATM401	45.499057	15.551889	112.8	3/1/21	14.5
KUDICA - SKOLA BANJA - KARLOVAC.ATM401	45.499057	15.551889	112.8	3/2/21	20.8
KUDICA - SKOLA BANJA - KARLOVAC.ATM401	45.499057	15.551889	112.8	3/2/21	28.8
KUDICA - SKOLA BANJA - KARLOVAC.ATM401	45.499057	15.551889	112.8	3/3/21	21.2
KUDICA - SKOLA BANJA - KARLOVAC.ATM401	45.499057	15.551889	112.8	3/4/21	22.2
KUDICA - SKOLA BANJA - KARLOVAC.ATM401	45.499057	15.551889	112.8	3/5/21	14.6
KUDICA - SKOLA BANJA - KARLOVAC.ATM401	45.499057	15.551889	112.8	3/6/21	7.8
KUDICA - SKOLA BANJA - KARLOVAC.ATM401	45.499057	15.551889	112.8	3/7/21	7.6
KUDICA - SKOLA BANJA - KARLOVAC.ATM401	45.499057	15.551889	112.8	3/8/21	21.7
KUDICA - SKOLA BANJA - KARLOVAC.ATM401	45.499057	15.551889	112.8	3/9/21	13.9
KUDICA - SKOLA BANJA - KARLOVAC.ATM401	45.499057	15.551889	112.8	3/10/21	20.4
KUDICA - SKOLA BANJA - KARLOVAC.ATM401	45.499057	15.551889	112.8	3/11/21	17.5
KUDICA - SKOLA BANJA - KARLOVAC.ATM401	45.499057	15.551889	112.8	3/12/21	12
KUDICA - SKOLA BANJA - KARLOVAC.ATM401	45.499057	15.551889	112.8	3/13/21	17.8
KUDICA - SKOLA BANJA - KARLOVAC.ATM401	45.499057	15.551889	112.8	3/14/21	11.4
KUDICA - SKOLA BANJA - KARLOVAC.ATM401	45.499057	15.551889	112.8	3/15/21	14.6
KUDICA - SKOLA BANJA - KARLOVAC.ATM401	45.499057	15.551889	112.8	3/16/21	12.2
KUDICA - SKOLA BANJA - KARLOVAC.ATM401	45.499057	15.551889	112.8	3/17/21	14.6
KUDICA - SKOLA BANJA - KARLOVAC.ATM401	45.499057	15.551889	112.8	3/18/21	6
KUDICA - SKOLA BANJA - KARLOVAC.ATM401	45.499057	15.551889	112.8	3/19/21	11.9
KUDICA - SKOLA BANJA - KARLOVAC.ATM401	45.499057	15.551889	112.8	3/20/21	2.3
KUDICA - SKOLA BANJA - KARLOVAC.ATM401	45.499057	15.551889	112.8	3/21/21	16
KUDICA - SKOLA BANJA - KARLOVAC.ATM401	45.499057	15.551889	112.8	3/22/21	5
KUDICA - SKOLA BANJA - KARLOVAC.ATM401	45.499057	15.551889	112.8	3/23/21	12.5
KUDICA - SKOLA BANJA - KARLOVAC.ATM401	45.499057	15.551889	112.8	3/24/21	21.4
KUDICA - SKOLA BANJA - KARLOVAC.ATM401	45.499057	15.551889	112.8	3/25/21	22.7
KUDICA - SKOLA BANJA - KARLOVAC.ATM401	45.499057	15.551889	112.8	3/26/21	22.6
KUDICA - SKOLA BANJA - KARLOVAC.ATM401	45.499057	15.551889	112.8	3/27/21	23.6
KUDICA - SKOLA BANJA - KARLOVAC.ATM401	45.499057	15.551889	112.8	3/28/21	12.3
KUDICA - SKOLA BANJA - KARLOVAC.ATM401	45.499057	15.551889	112.8	3/29/21	29.5
KUDICA - SKOLA BANJA - KARLOVAC.ATM401	45.499057	15.551889	112.8	3/30/21	25.7
KUDICA - SKOLA BANJA - KARLOVAC.ATM401	45.499057	15.551889	112.8	3/31/21	31.2

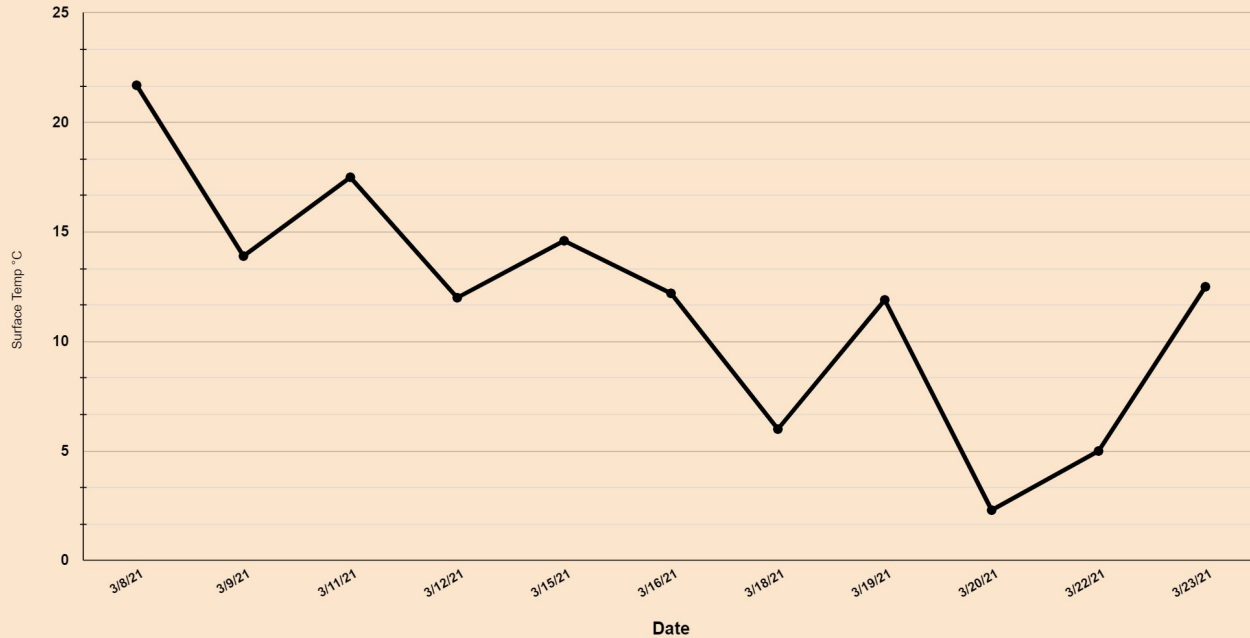
Data Graphs: Navarre Elementary, Toledo, Ohio Grass



Data Graphs: OS Banija, Croatia

OS Banija, Croatia Surface Temperatures - Short Grass

March 2021



Data Analysis

Navarre: Grass

- Range of Temperatures: 1°C - 32°C
- Average Temperature: 16°C

Croatia: Grass

- Range of Temperatures: 2.5°C - 22°C
- Average Temperature: 12°C

Analysis:

The average temperature of Croatia school is **colder** than the average temperature of Navarre Elementary

The lowest temperature of Croatia school is **warmer** than the lowest temperature of Navarre Elementary

The highest temperature of Croatia school is **colder** than the lowest temperature of Navarre Elementary

Limitations / Sources of Error

- **The times the temperatures were taken were different.**
Some Navarre temps were taken at 11:45 a.m. & 2:45 p.m.
Croatia temps was taken between 10:00 a.m. -11:00 a.m.
- **Data may have been taken or entered incorrectly.**

Conclusions

Our hypothesis was that we are at similar latitude north of the equator so temperatures will be similar.

Croatia took temperatures in the morning and, overall, were cooler; however not significantly, due to the time difference.

The data supported our hypothesis. Our hypothesis was valid

Works Cited / Bibliography

GLOBE.gov

GoogleEarth.com



Thank you!