

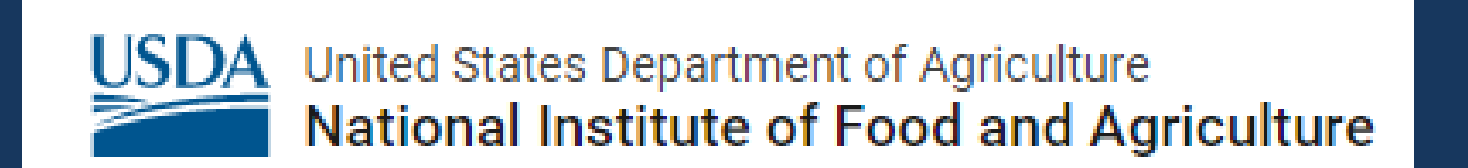


The Application of Climate Data in Research for the Mass Population

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Abstract

Climate data is critical to conducting appropriate scientific research to allow stakeholders to make informed agricultural production decisions under a changing climate. The relevant use of climate data can also complement educational endeavors for enhancing science literacy, regarding climate and climate variability. This study details the use of climate data in the context of exploration of climatic parameters, navigating data repositories based on research requirements, data selection, and the importance in agricultural practices. In addition, suggestions are offered for climate data formatting for appropriate use in research models and sharing climatic information with relevant users. The need for climate data in agricultural research and the criticality of using the correct format and units is also highlighted. Finally, tools for data procurement from national databases and weather stations as well as techniques for collecting, simplifying, and converting climate data to a usable format for potential use in undergraduate research is examined.

Climate Data Importance, Application and Problems

- ✓ Climate data is essential to understand fluctuating weather patterns and predict future trends and probable impacts.
- ✓ Climate data is also critical to conducting applicable scientific research to allow stakeholders to make informed agricultural production decisions under a changing climate.
- ✓ Climate data can be applied to a variety of crop production and management decisions that help reduce risks associated with crop production and allow producers to enhance sustainability.
- ✓ Climate data is applicable in several areas in the livestock industry, ranging from animal health, market prices, and livestock production. For instance, it can be used to track heat and humidity factors which are vital to a commercial swine or poultry house operations.
- ✓ Climate data also provides the opportunity for potential research regarding the agricultural industry, specifically in the livestock sector, such as studying the impact of climatic variables on livestock market prices. Such projects would allow for the application and analysis of climate change and variability on parameters such as animal weight and overall farm profitability.

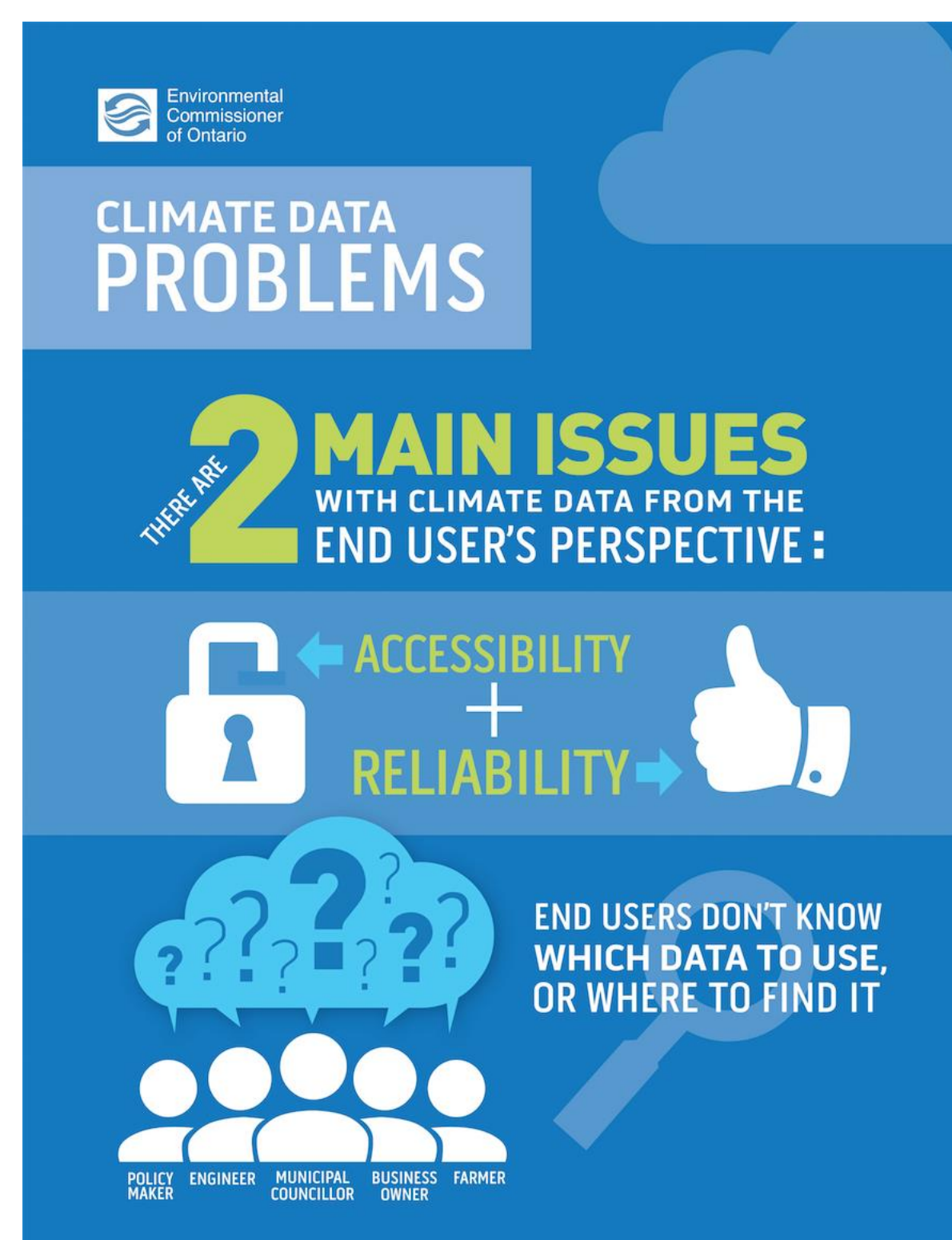


Figure 1: Climate data problems (Pasht and Krechowicz, 2019)



Figure 2: Application of climate data in agriculture and livestock production decisions

Climate Data Sources

- ✓ Climate data is collected from a variety of sources including but not limited to satellites and weather stations.
- ✓ Weather stations collect climate data using a range of techniques and instruments including weather balloons, radars, ships and buoys, and satellites.
- ✓ Climate data collected daily, monthly, yearly are documented and available for public access on different databases.
- ✓ Climate data can be sorted and searched by a weather station's name, data can additionally be searched more precisely by zip code, country, state, and city using databases like the National Climatic Data Center.

Tools for data analysis and use in student research

- ✓ Climate data analysis software
- ✓ Climate models
- ✓ Statistical tools
- ✓ Experimental data/Secondary data
- ✓ Crop models
- ✓ Simulation software

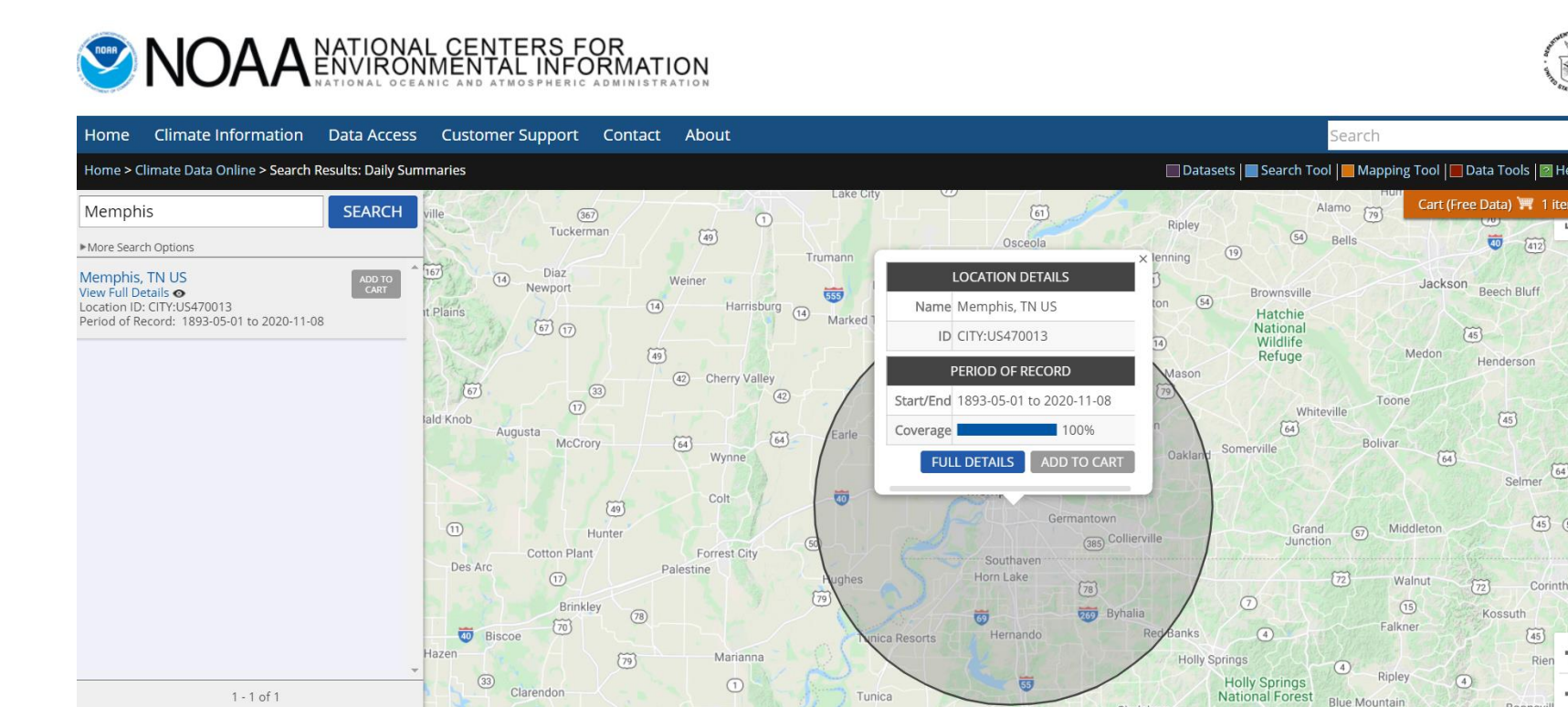


Figure 3: Climate data mapping tool (NCDC)

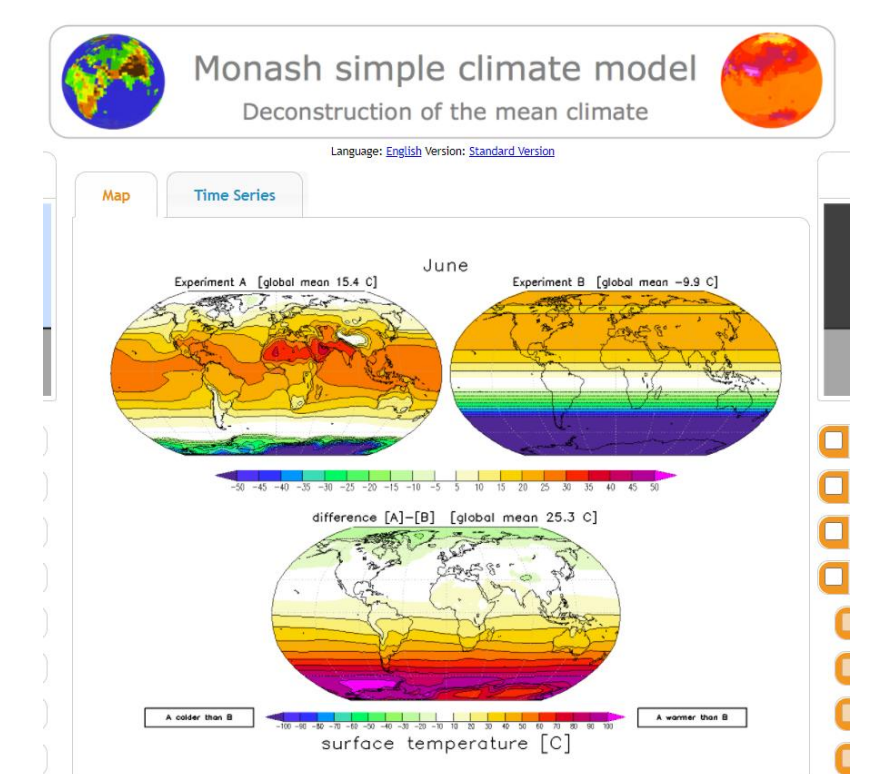


Figure 4: Monash University Simple Climate Model

Implications and conclusion

- ✓ Climate data is applicable in diverse areas of the public and private sector. By procuring and formatting climate data correctly, the mass population can comprehend and apply this information to make appropriate decisions in both sectors.
- ✓ Climate data is applicable to the mass population through several sectors including transportation, water resources, human health, and agriculture.
- ✓ Using appropriate climate data units is vital to allowing not only the global research community but the mass population to have the ability to understand and analyze the data and opens opportunities to collaborate both globally and nationally for projects that are beneficial to the society.

References and Acknowledgement

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- ✓ Pasht, K. B., & Krechowicz, D. (2019, December 06). Why Does Access to Good Climate Data Matter? Retrieved October 27, 2020, from <https://public.wmo.int/en/resources/bulletin/why-does-access-good-climate-data-matter>

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