Augmenting Climate Change Research by Leveraging Geospatial Big Data, Cloud Computing, Machine Learning and Digital Twins.

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Why Climate Change issues are globally important?

https://svs.gsfc.nasa.gov/5190/#section_credits

Understanding Air Quality & Health Risks

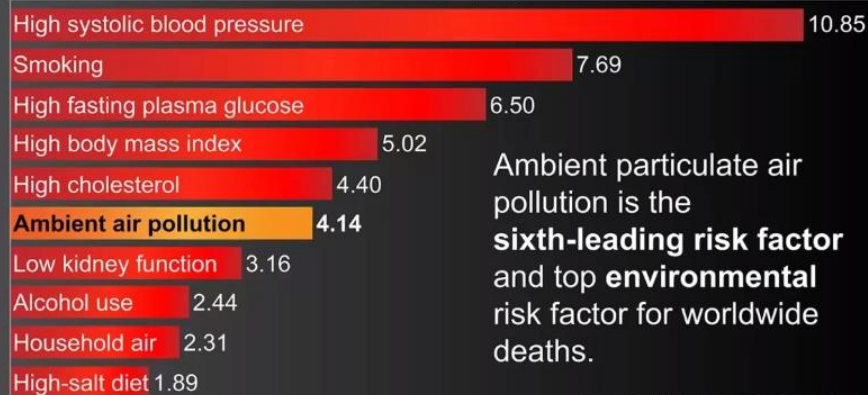nasaenterprise.webex.com is sharing your screen. Stop sharing Hide

Poor air quality has negative implications for human health:

- Exposure to outdoor air pollution is responsible for about 1 in 9 deaths worldwide (WHO, 2018; Cohen et al., 2017).
- The majority of deaths are associated with **PM2.5**.
- Exposure to **O_3** is associated with about another 250 thousand deaths annually worldwide (Cohen et al., 2017).

Top 10 risk factors for worldwide deaths, 2019

Deaths in millions, per year

High systolic blood pressure	10.85
Smoking	7.69
High fasting plasma glucose	6.50
High body mass index	5.02
High cholesterol	4.40
Ambient air pollution	4.14
Low kidney function	3.16
Alcohol use	2.44
Household air	2.31
High-salt diet	1.89

Ambient particulate air pollution is the **sixth-leading risk factor** and top **environmental** risk factor for worldwide deaths.

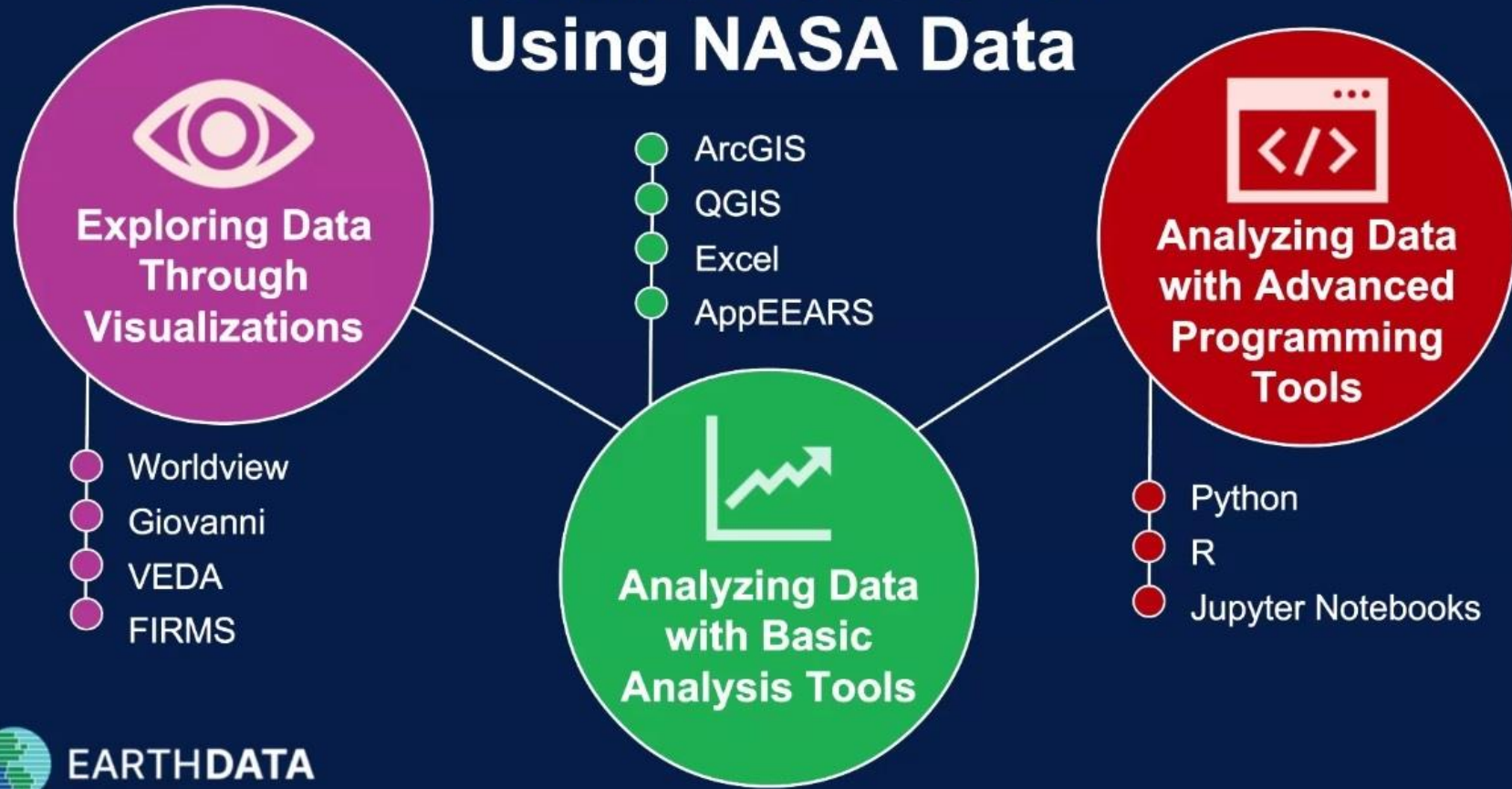Source: 2019 Global Burden of Disease

SCAN ME

How you one can access Climate Change related Big Data https://www.earthdata.nasa.gov/ (try?)

Where anyone can start to work practically with Geospatial Big Data: free solution: Google Earth Engine

- A cloud computing based platform for planetary scale remote sensing
- A platform that has Big Data, Big Computing and Big Algorithms all in one place; all accessed via a *Big Data Pipeline (Broadband Internet)*
- Makes use of Geospatial Big Data and image processing available to all with broadband internet.
- Is relevant fort study research and practice.
- Let's look on what is on and under the hood?

Exploring Time laps

GEE App: The Community Climate Change Impact Service (C3IS) https://ukgnail.users.earthengine.app/view/community-climate-change-impact-service

- C3IS offers a paradigm shift: a user-friendly, cloud-based platform integrating big data and real-time visualization.

- Image: A graphic contrasting traditional climate analysis methods with the streamlined C3IS workflow.

- Enables timely, accurate data for informed decision-making and effective mitigation strategies.

- Potential for widespread application in various geographic contexts and climate-related challenges.

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Can we Trust AI: Why Human in the loop?ML less robust than you think

+0.005   *

Pig (90%)

Noise (attacker induced)

airplane (90%)

Source – Intriguing Properties of Neural Networks, Szegedy et al 2013

Modification: Integration of multiple sources to the Collaborative Expert Knowledge Extraction System (EXTRA): https://tz.ektu.kz/extra

https://hungermap.wfp.org/

https://talkai.info/chat/

https://tz.ektu.kz/extra
collaborative-expert-knowledge-extraction-extra

https://docs.google.com/forms/d/e/1FAIpQLS
fiLVgsAW_wlKaHii7j3W17HNZlmSZu3F4ZuVXS
fM22vOTK3g/viewform

Integration of geospatial Community Climate Change Impacts Service (C3IS) based on the Google Earth Engine (GEE) to the Collaborative Expert Knowledge Extraction System (EXTRA)
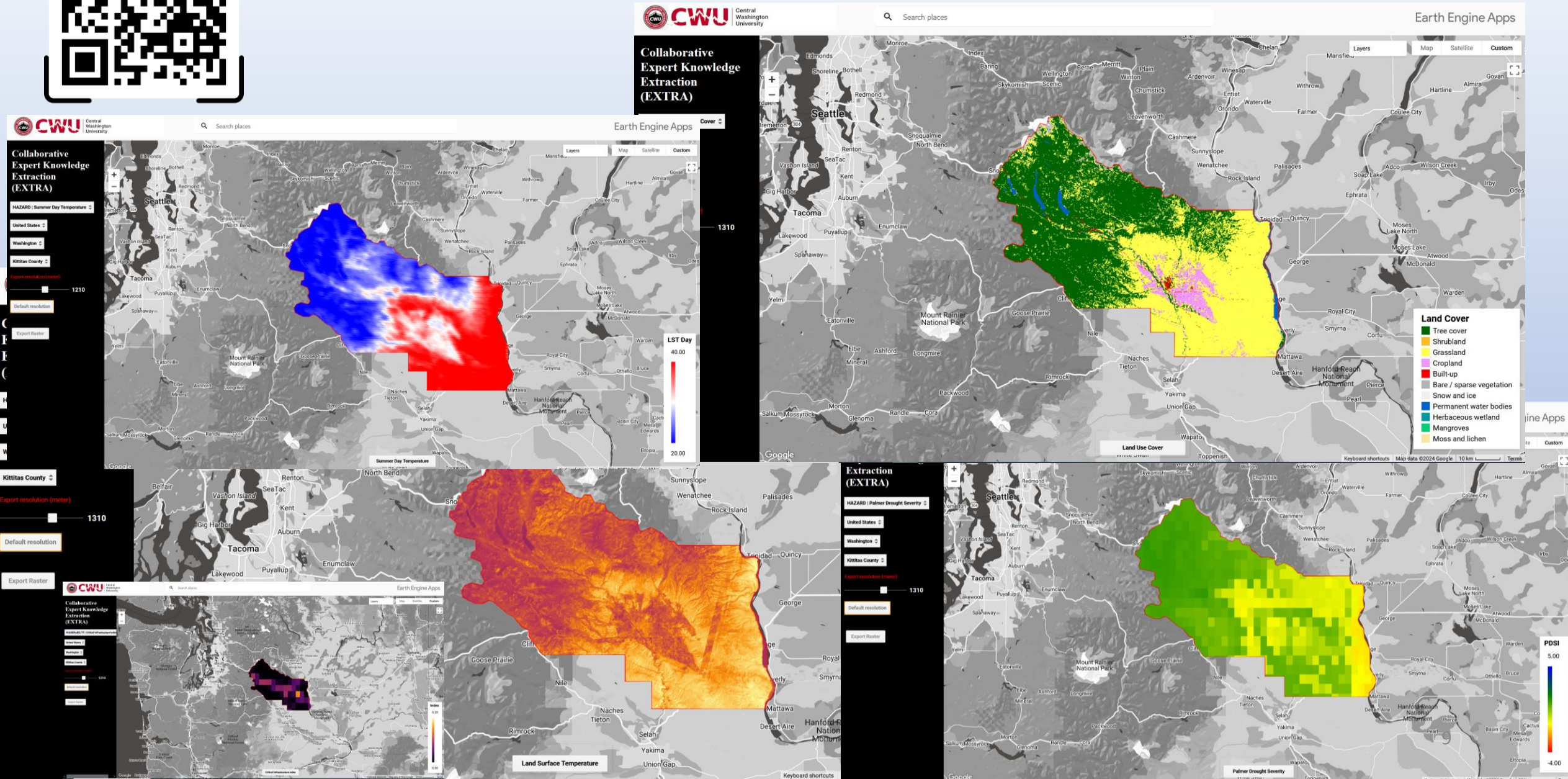
Thank you / QA?

Рахмет

Спасибо

ありがとう

謝謝

Education is what remains after one has **forgotten** what one has learned in **school**.

- Albert Einstein

Goalcast

"An ordinary person teaching another" echoes like a comedy.

Эгэл хүмүүн эгэлд ном заах нь Инээдмийн орон болж цуурайтах