System of Environmental Economic Accounting

Session 12: Communication Tools: Presenting the Accounts to Policymakers

28-31 October 2019, Pretoria, South Africa

#SEEAAfricaTraining

@UNStats @GDSAofficial1 @ECA_OFFICIAL @UNEnvironment @StatsSA @EU_ENV

stats sa
Department: Statistics South Africa
REPUBLIC OF SOUTH AFRICA

United Nations

gaborone declaration for sustainability in africa

Outline

- Video
- General points on communications
- Use of data visualization
- Examples and tools

UN environment

United Nations

System of Environmental Economic Accounting

African countries lead on natural capital accounting

http://www.gaboronedeclaration.com/nca

video

How do we ensure that statisticians and the policymakers are looking the same way?

Competing demands for information: zooming in or zooming out?

Source: P.K. Nelson

Competing demands for information: complexity or nuance?

v cost.

The dynamics of the shadow value of the wildlife stock to the community are de

$$\dot{\gamma} = -R_W - \alpha p H_W - \beta T_W + \gamma(\delta - F_W + H_W + Q_W) \quad (6)$$

nunity Requirements for a Steady State

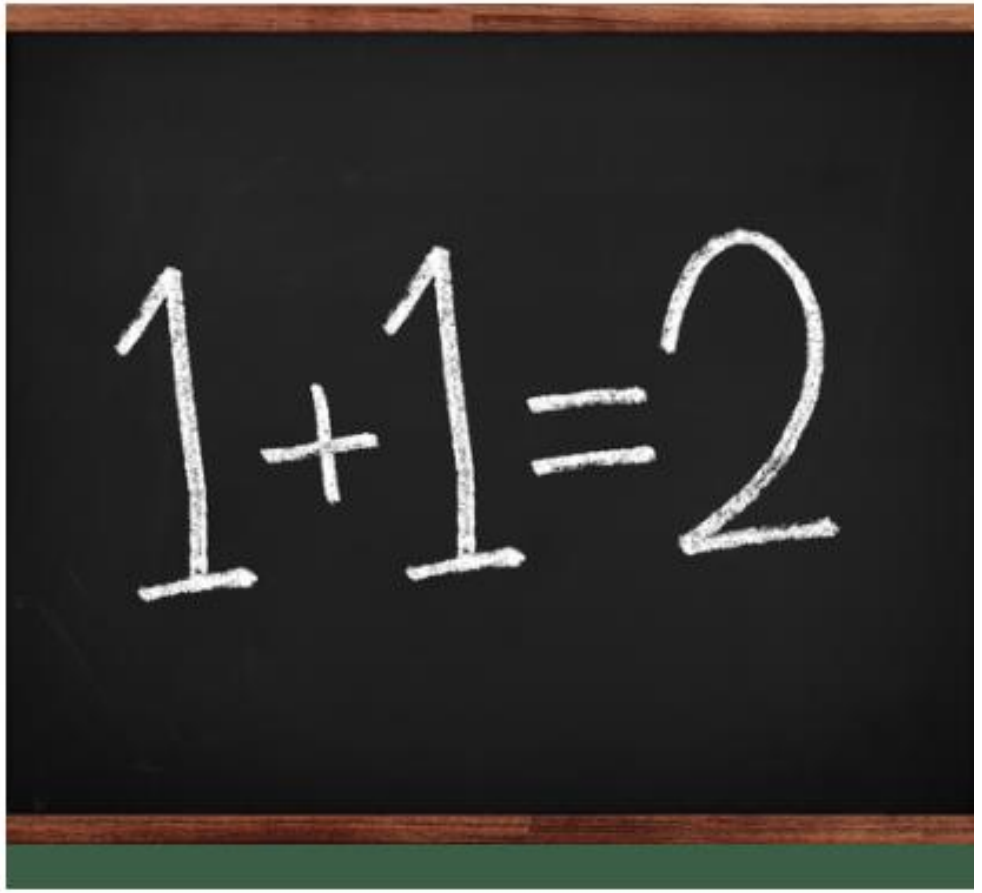
In a steady state, $\dot{W} = 0$, and off-take from hunting and poaching must equal gr

$$H(W,A) + Q(W,A) = F(W) \quad (7)$$

onally, $\dot{\gamma} = 0$ and the shadow value of wildlife equals

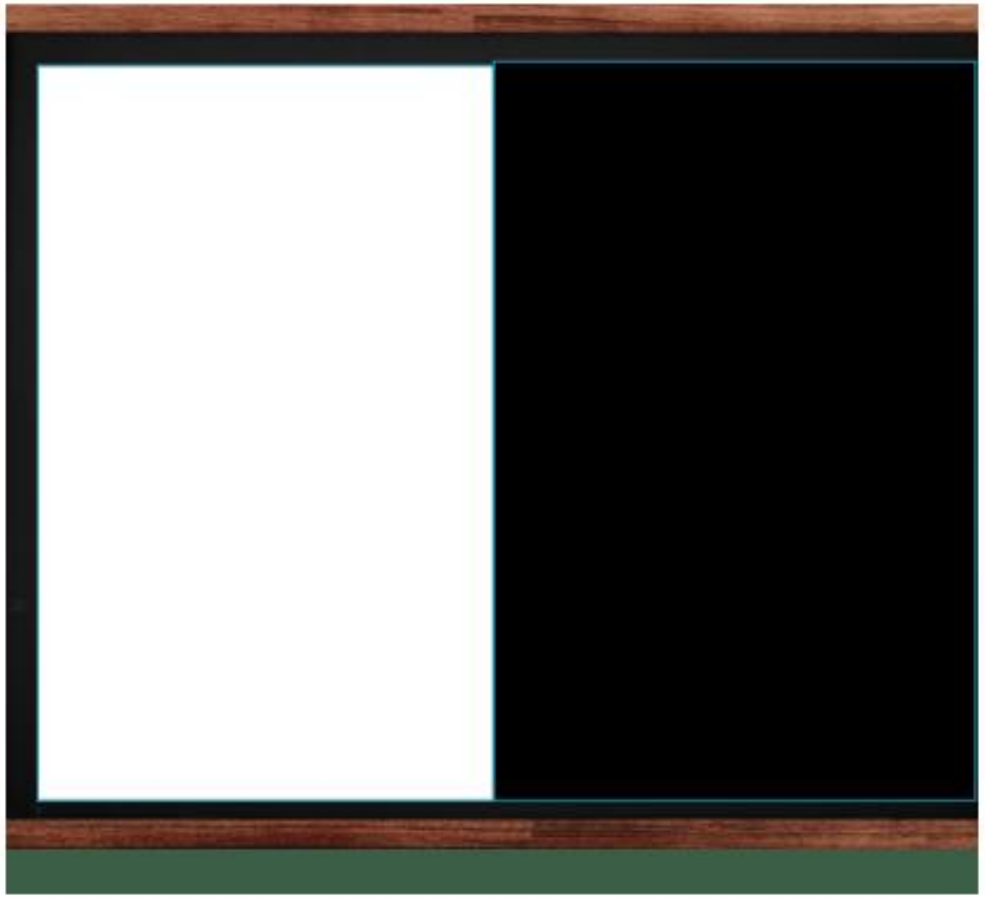
$$\gamma^* = \frac{R'(W) + \beta T'(W) + \alpha p H_W(W,A)}{\delta - F'(W) + H_W(W,A) + Q_W(W,A)} \quad (8)$$

Note that this shadow value can be positive or negative, depending on the sign o
ıal net benefits to the community (let $MNB = R_W + \alpha p H_W + \beta T_W$) and on the exc
count rate over the marginal net growth (natural replenishment rate net of margin
ting and poaching, or $MNG = F_W - H_W - Q_W$). As Horan and Bulte (2004) discus
uity in the sign of the shadow value leads to the possibility of multiple equilibria



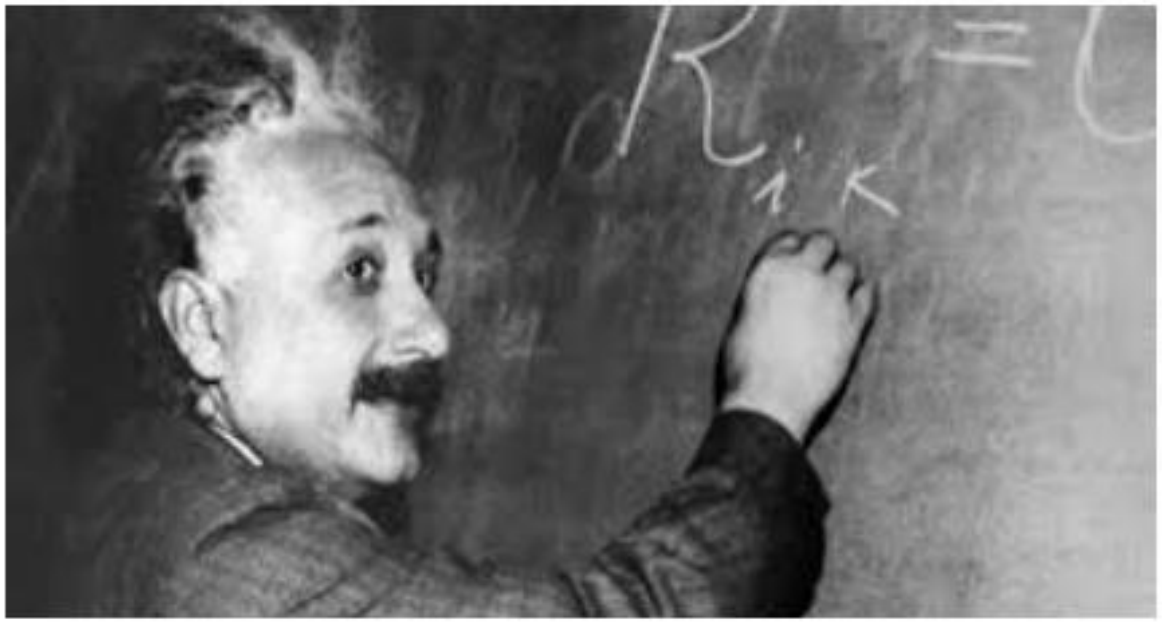
Source: P.K. Nelson

Competing demands for information: complexity or nuance?



Source: P.K. Nelson

Thoughts on Messaging



"If you can't explain it simply, you don't understand it well enough." – Albert Einstein

- Too many messages translate into no message. Try to boil down to one or two.
- Get to the point as quickly as possible. (The opposite of the academic template - put conclusions up front).
- Rule of thumb: If someone were to tell policymaker X about your research in a one-minute elevator conversation, what would you want them to say?

Source: P.K. Nelson

Thoughts on Clear Language

- "Old words are best and short old words are best of all." – Winston Churchill.

- Be ruthless about taking out jargon in policy-related communications. And yes, "externality" is jargon.
- Look for long sentences, >25 words, and eliminate extraneous words or break into two.
- Rule of thumb: Tell me what your research says in under 20 understandable words.

Source: P.K. Nelson

Quotes on Data Visualization

"Let the dataset change your mindset."

"Most of us need to listen to the music to understand how beautiful it is. But often that's how we present statistics: we just show the notes, we don't play the music."

- H. Rosling

"There is no such thing as information overload. There is only bad design."

- E. Tufte

"Visualization gives you answers to questions you didn't know you had."

- B. Schneidermann

"Data is not the new oil; it the new soil"

- D. McCandless

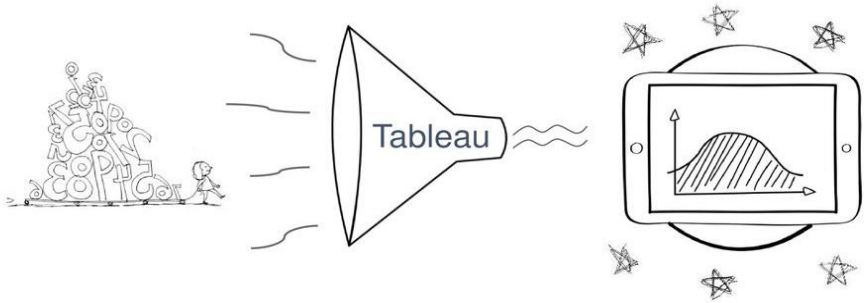
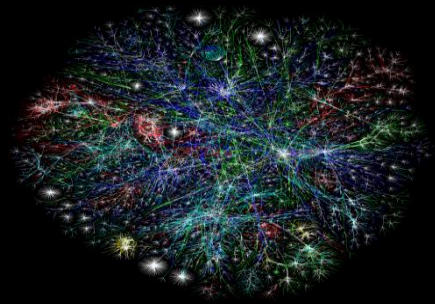


Image: Jeffrey A. Shaffer

The digital revolution is generating more environmental data than ever before, more ways to engage people, and more ways to use this data for spatial planning and decision-making.

Big Data / Earth Observation

Cloud computing



Artificial intelligence

5 billion unique mobile phones
2.5 billion smart phones

Internet of
Things (IoT)

Open source data and
software widely available

We are at a pivotal moment in environmental history where the way in which we deploy these technologies offers the possibility to measure and protect our planet.

Source: D. Jensen

Why Giving Thought to Visualisation is Important

Help users to overcome “information overload” or “data glut”.

Present-day demand / expectation for visual aspect to information.

Achieve two primary purposes: convey story and establish credibility.

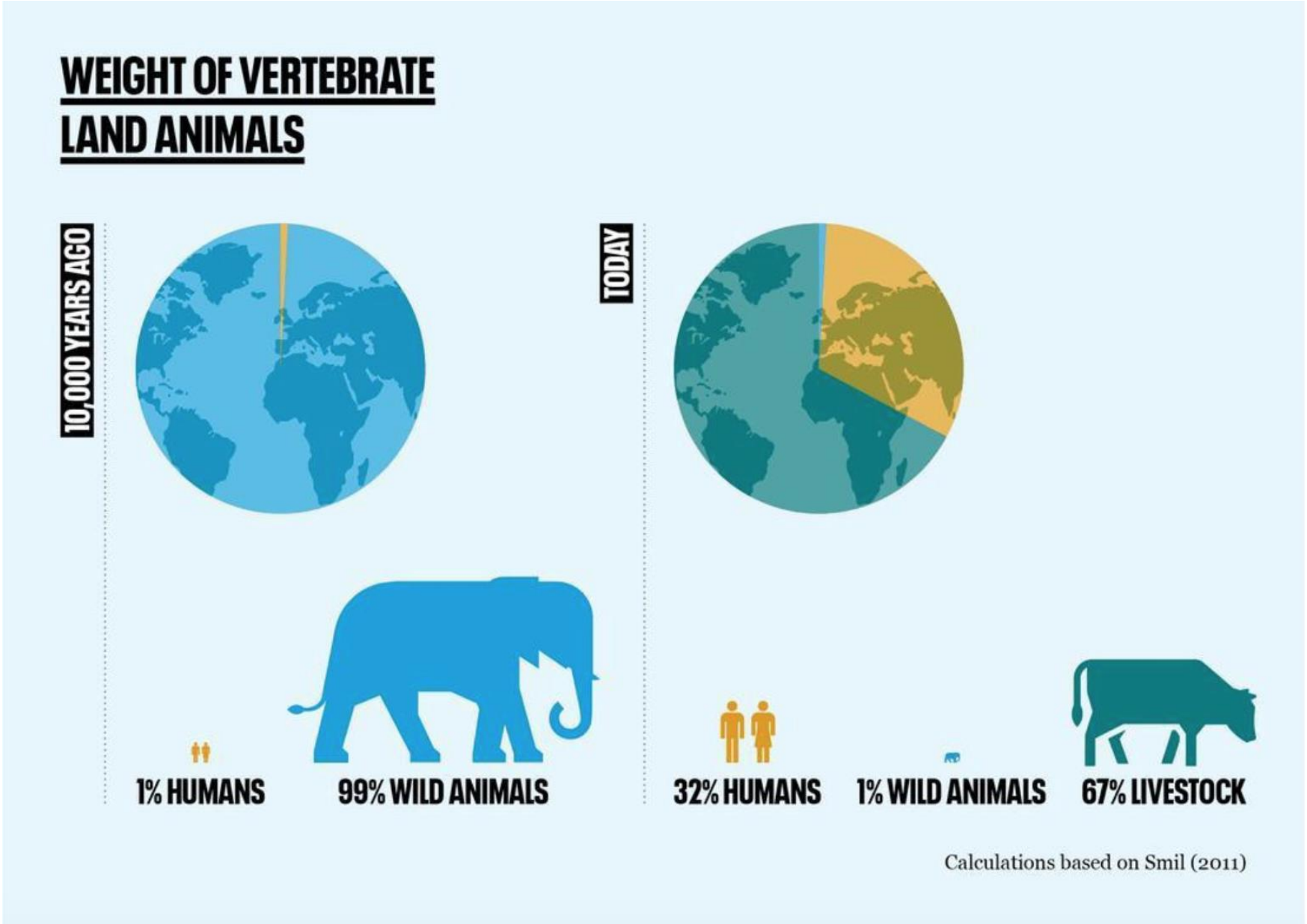
Design information so that it tells a story, and allows us to focus on the information that is truly important to users.

Present meaningful patterns and connections.

Principles of visualisations

Saliency	Robustness	Richness
• Relevance • Ease of application	• Scientific confidence • Uncertainties	• From highlights to detail • Caveats and contextual information

Simplifying information to tell big stories



MEGANUMEROPHOBIA

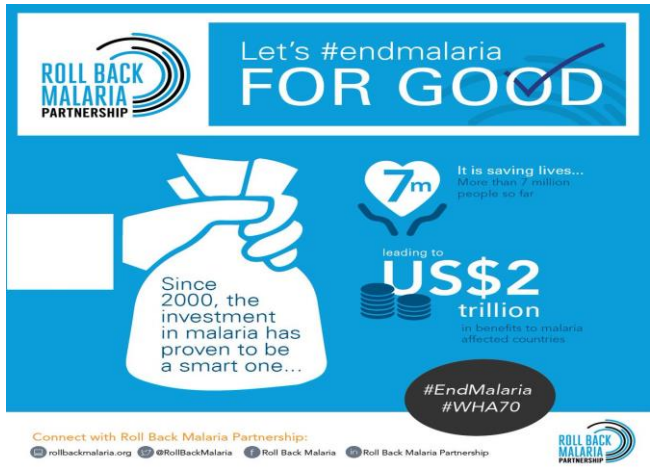
Companies Expect Climate Change to Cost Them $1 Trillion in 5 Years

UN says solving food crisis could cost $30 billion

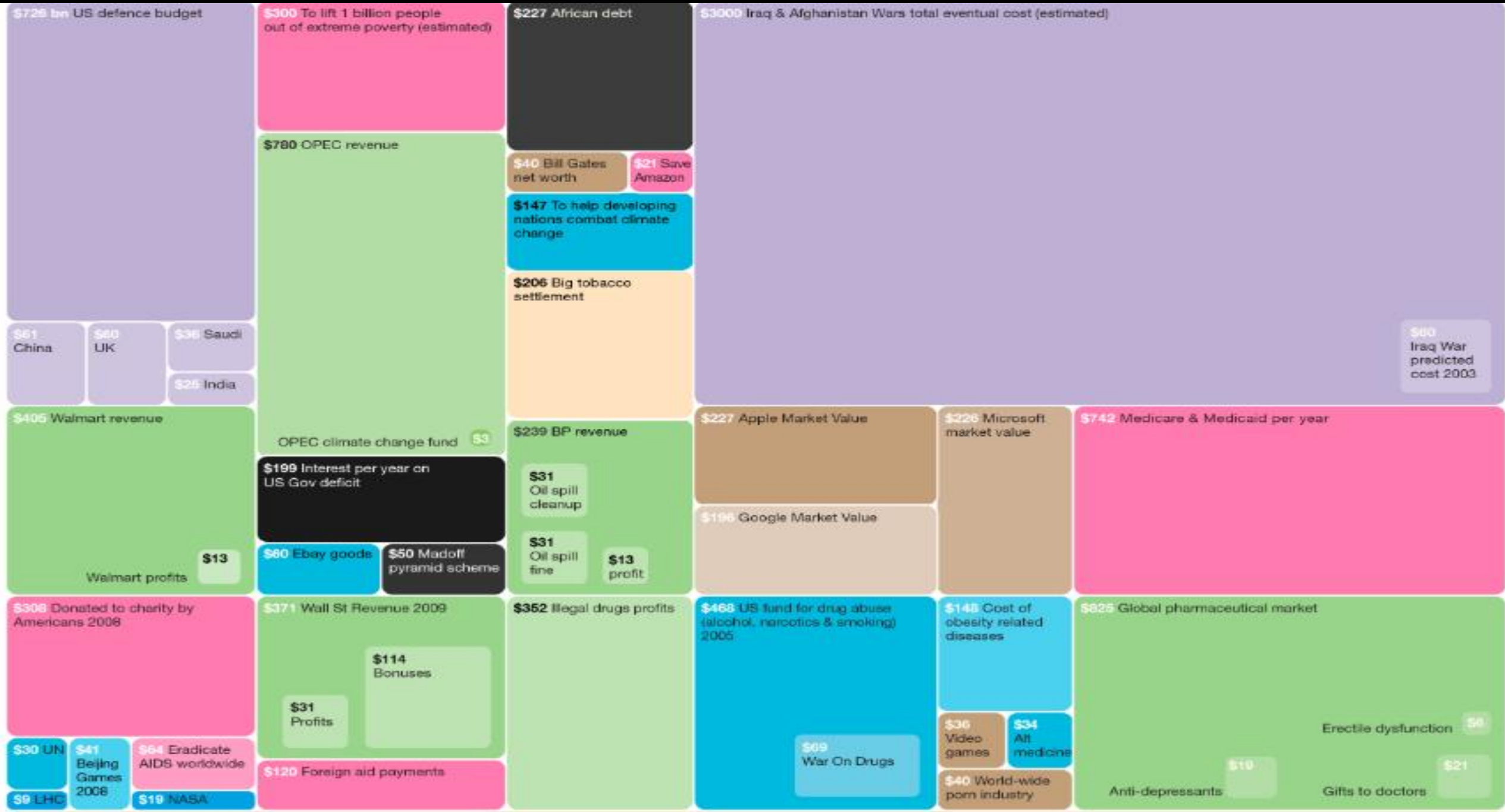
The Financial Crisis Cost the U.S Economy $22 Trillion

Land degradation costs the world up to $10.6tn a year, report says

Cost of Conserving Global Biodiversity Set at $76 Billion

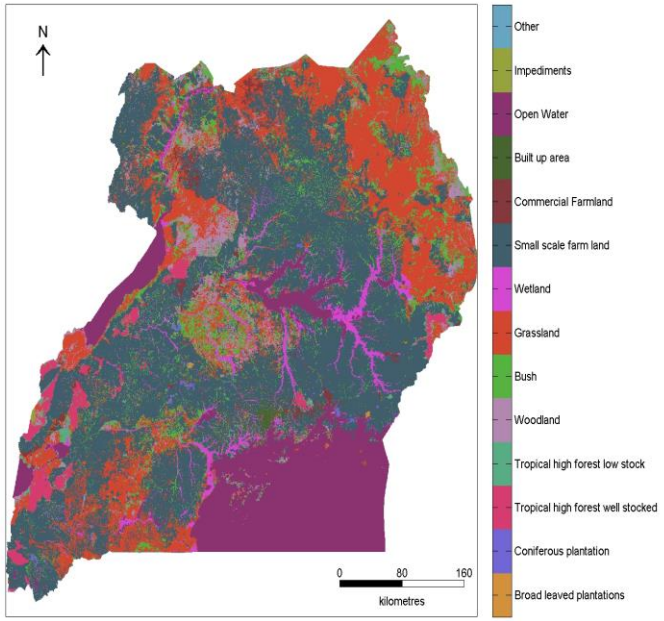


- "The estimate for the total global ecosystem services in 2011 is $125 trillion/yr (assuming updated unit values and changes to biome areas) and $145 trillion/yr (assuming only unit values changed), both in 2007 $US."
- "we estimated the loss of eco-services from 1997 to 2011 due to land use change at $4.3–20.2 trillion/yr, depending on which unit values are used"

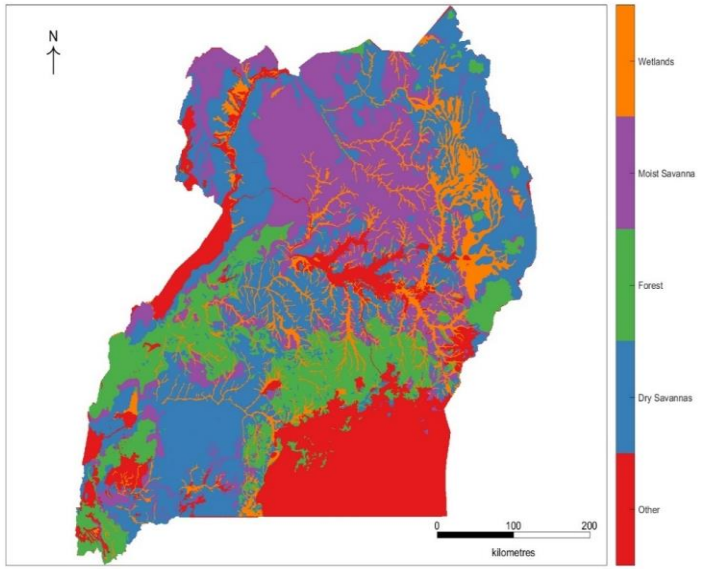


Souece: D. McClandless

Maps



produced using EnSym



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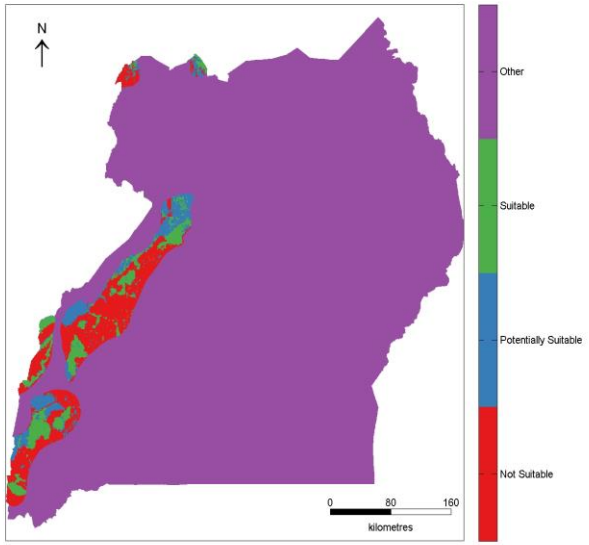
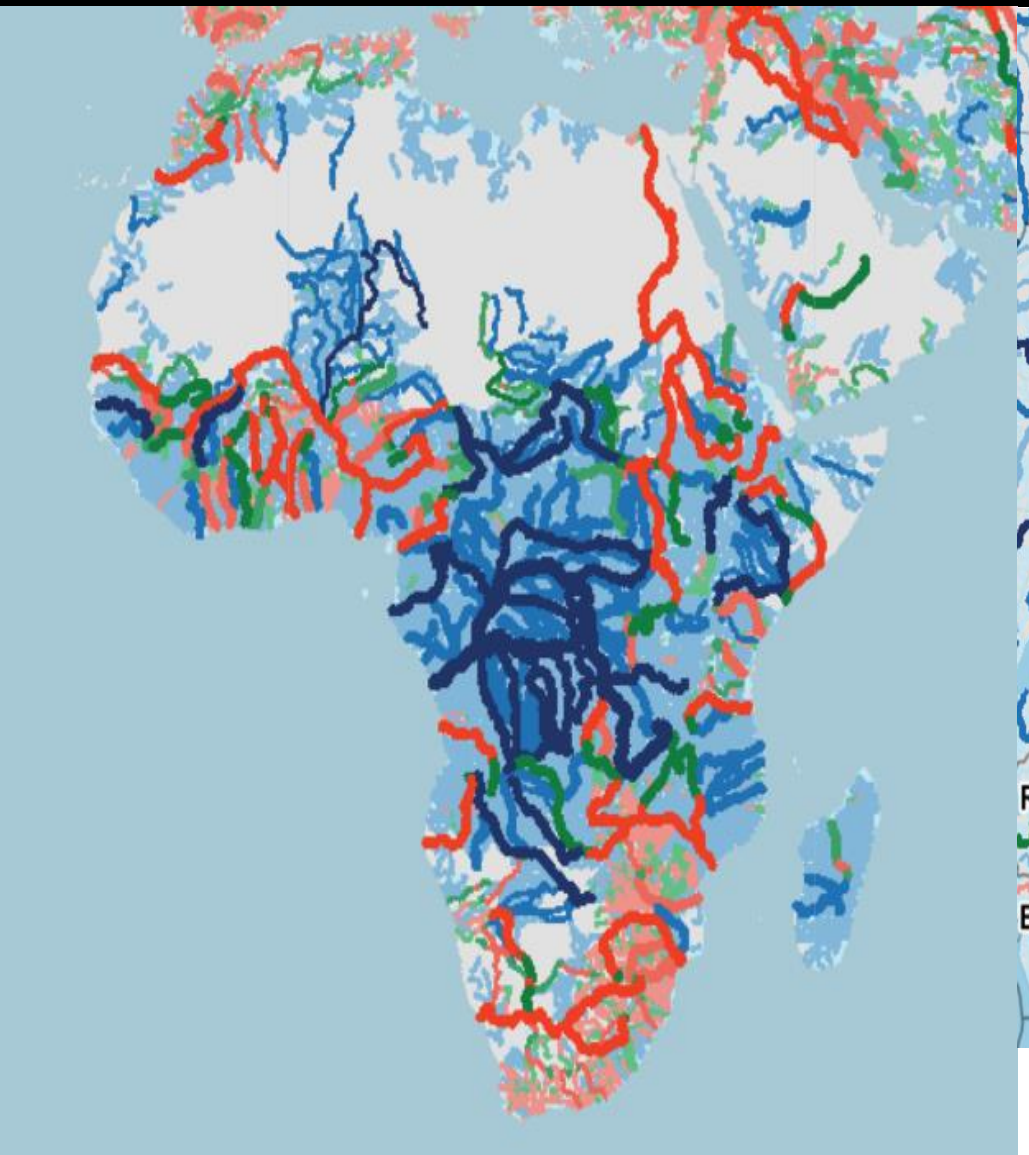
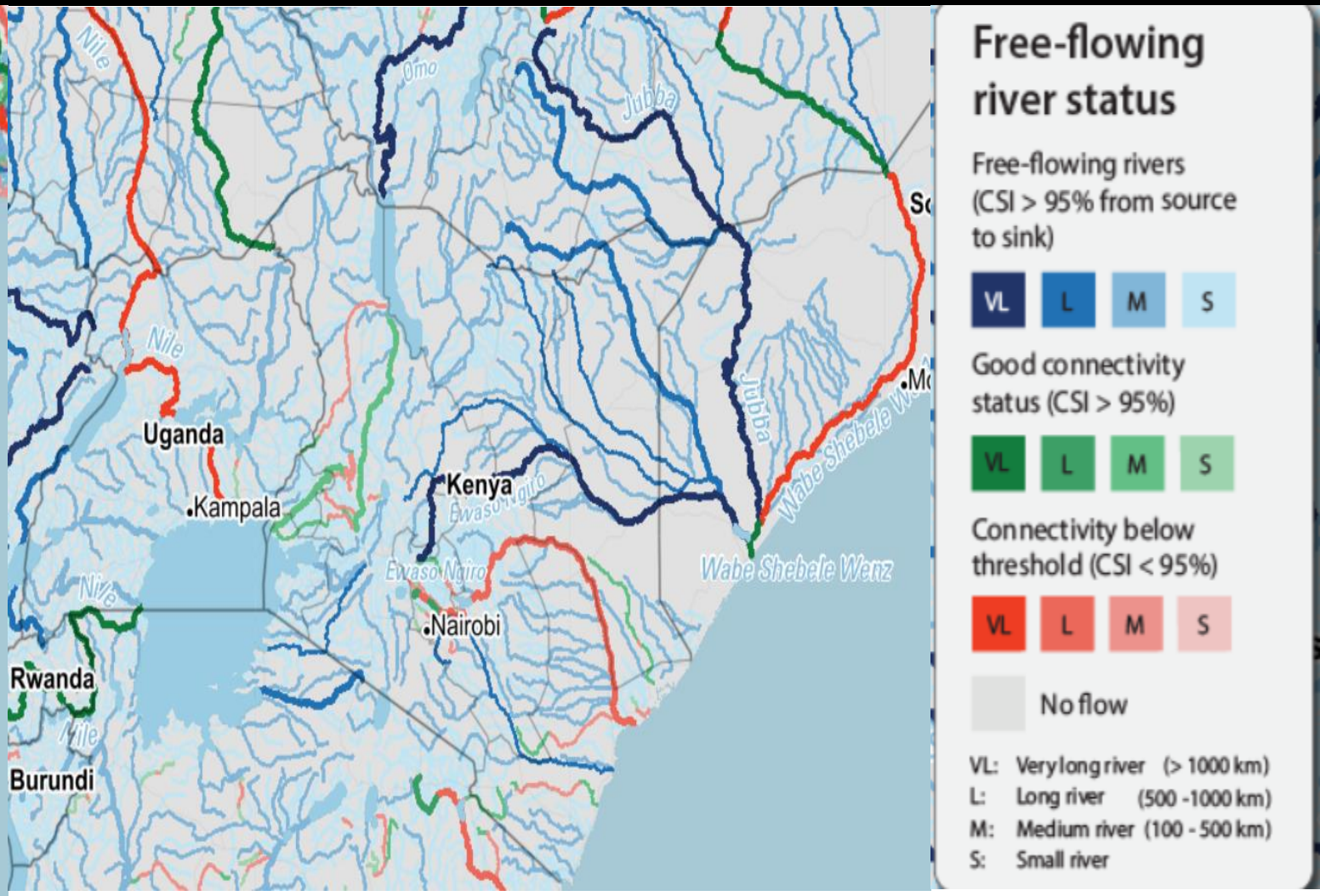


produced using EnSym

Source: EnSym.

Map of the world's free flowing rivers



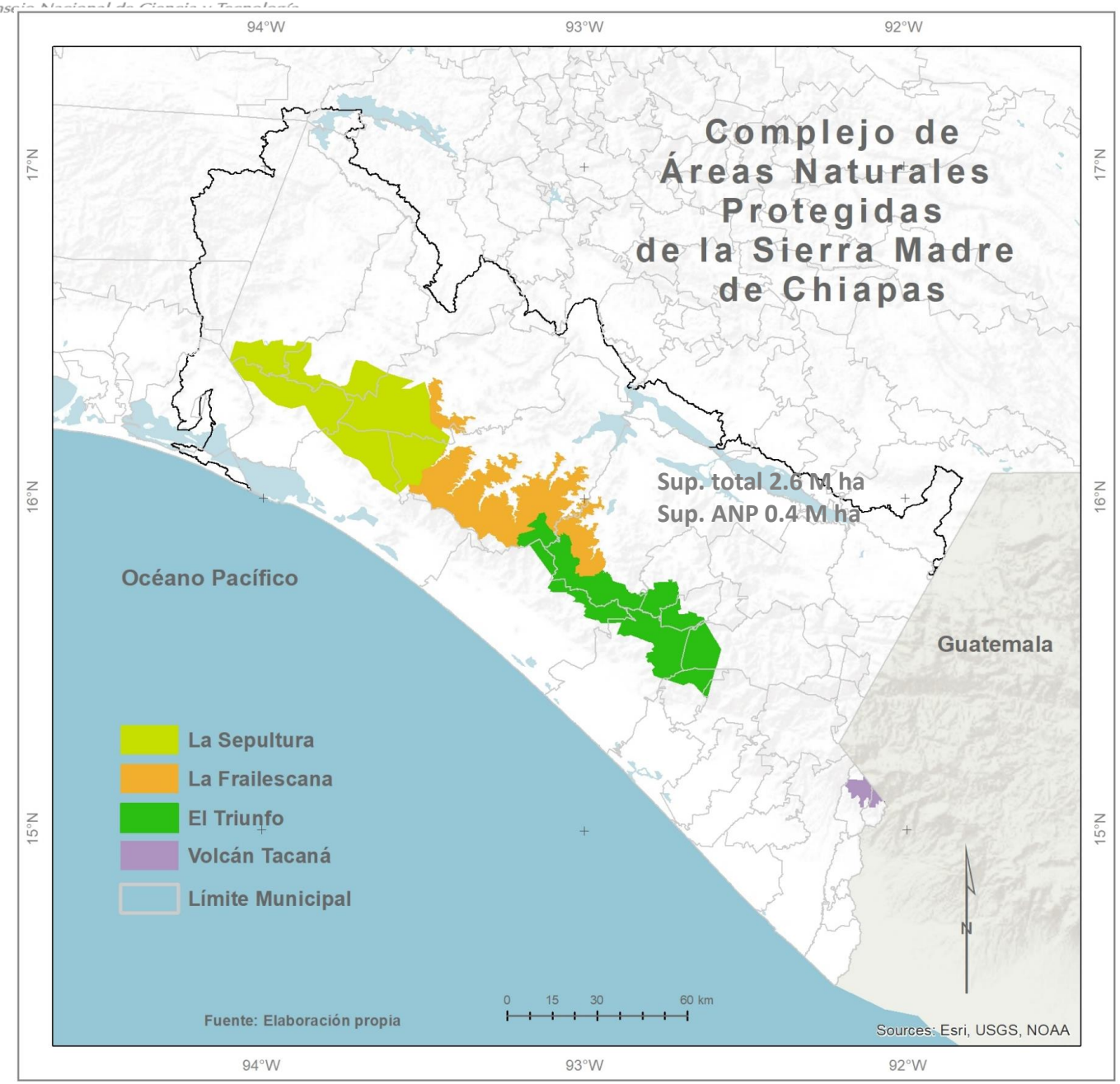


Source: http://hydrolab.io/ffr/#2/-47.4/121.6/FFR-CNT-NME-CNN-LKE

Ecosystem Service Valuation and Modelling of Scenarios in Chiapas

http://idegeo.centrogeo.org.mx/mviewer/VESE#

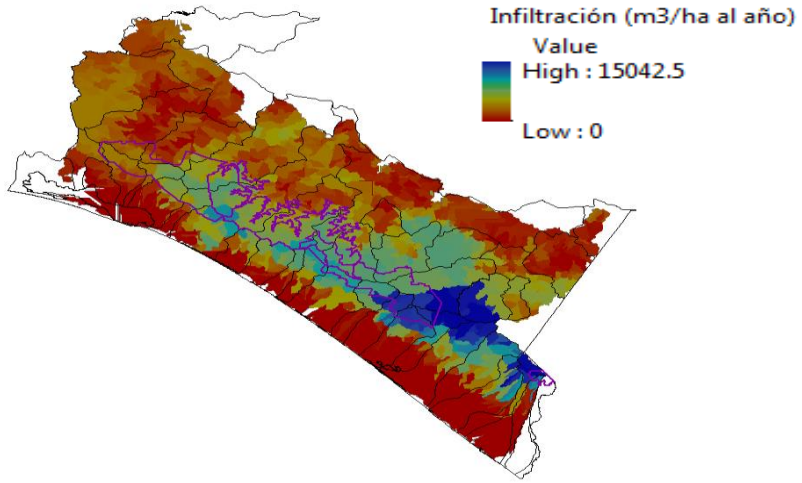
Study Area



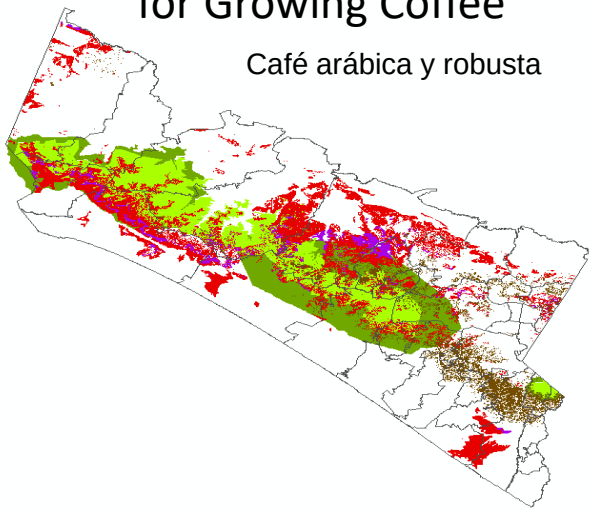
Four protected areas in one Mountain Range – Chiapas, Mexico

Biophysical modelling

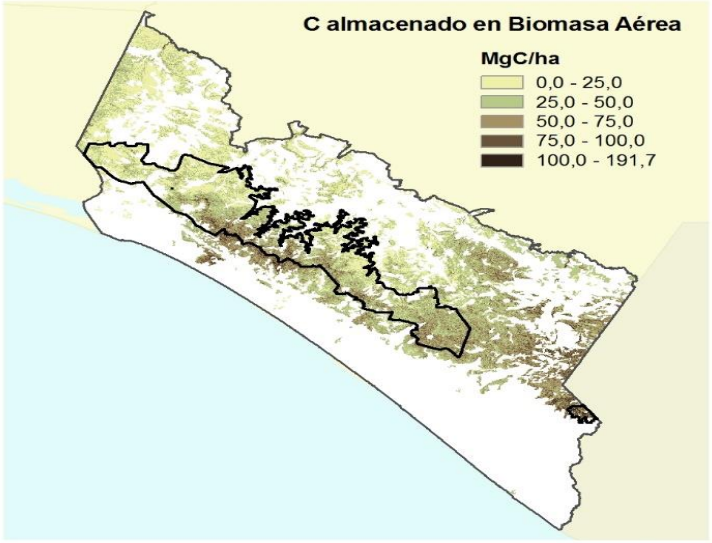
Water filtration

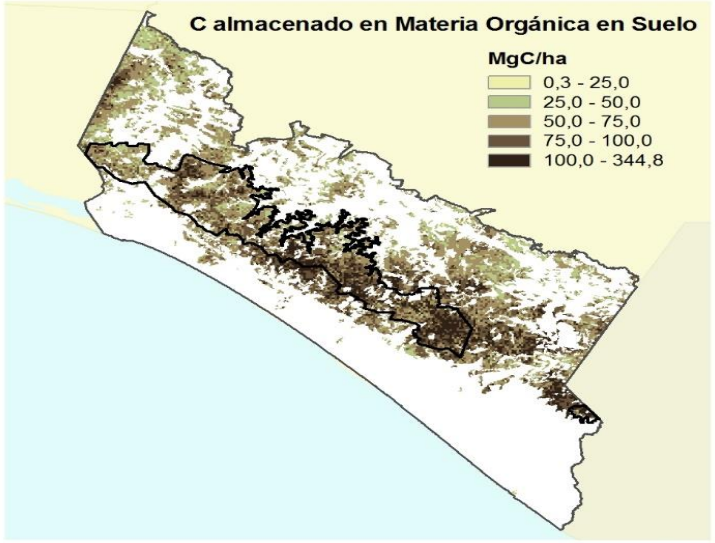


Soil and landscape aptitude for Growing Coffee



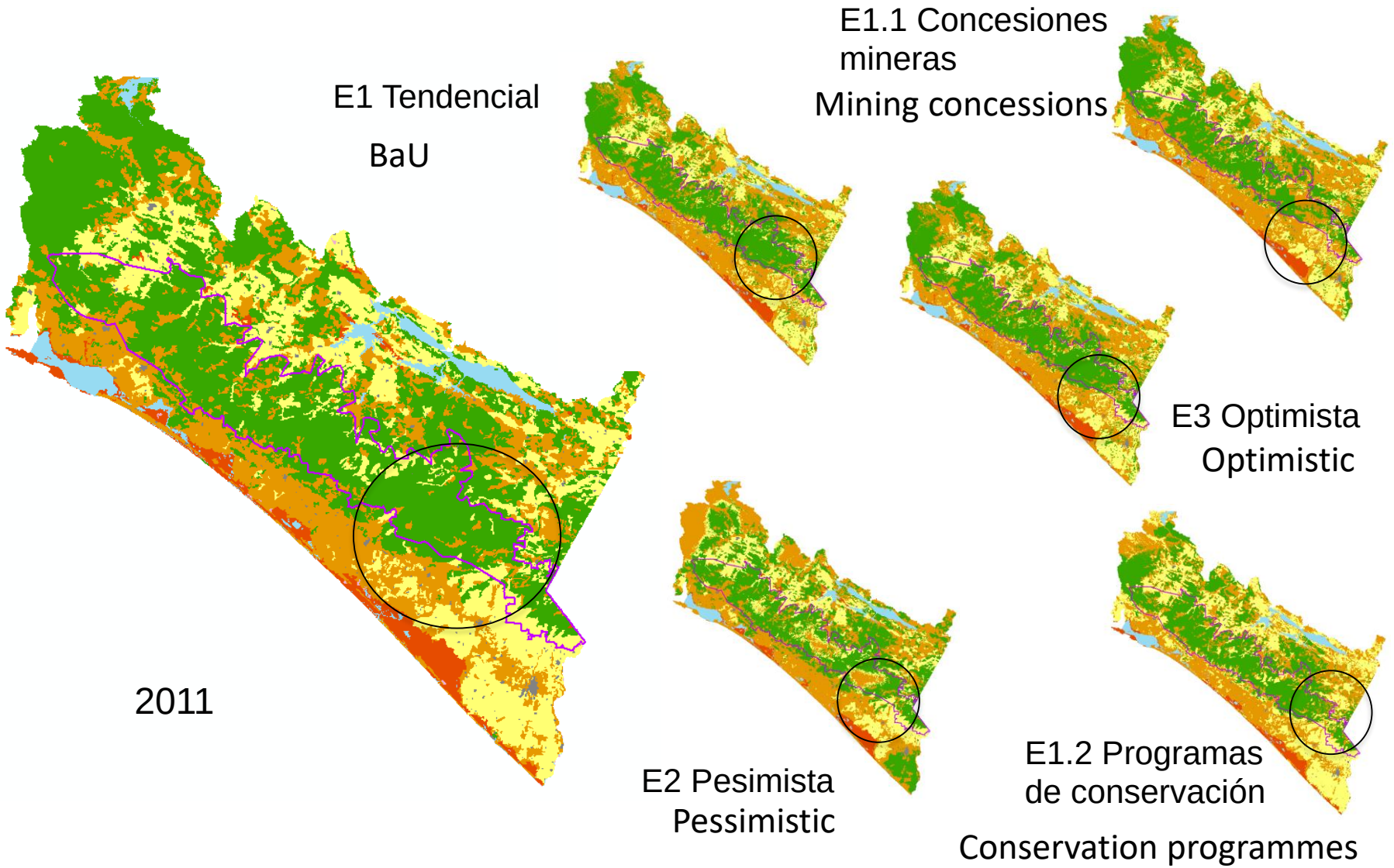
Stored carbon in forest biomass



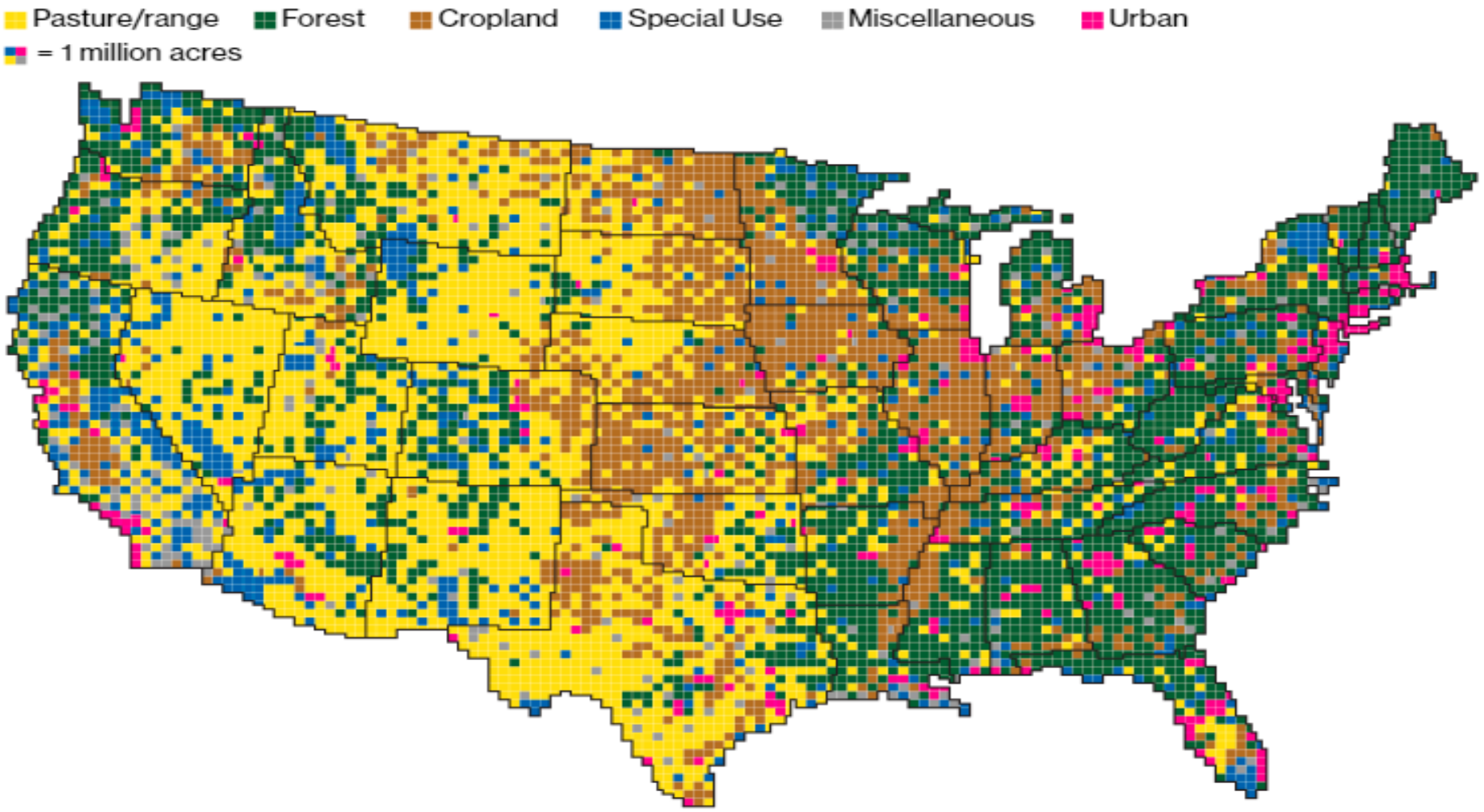


Stored carbon in soil organic matter

Model projections



“Here’s how America uses its land”



Source: https://www.bloomberg.com/graphics/2018-us-land-use/

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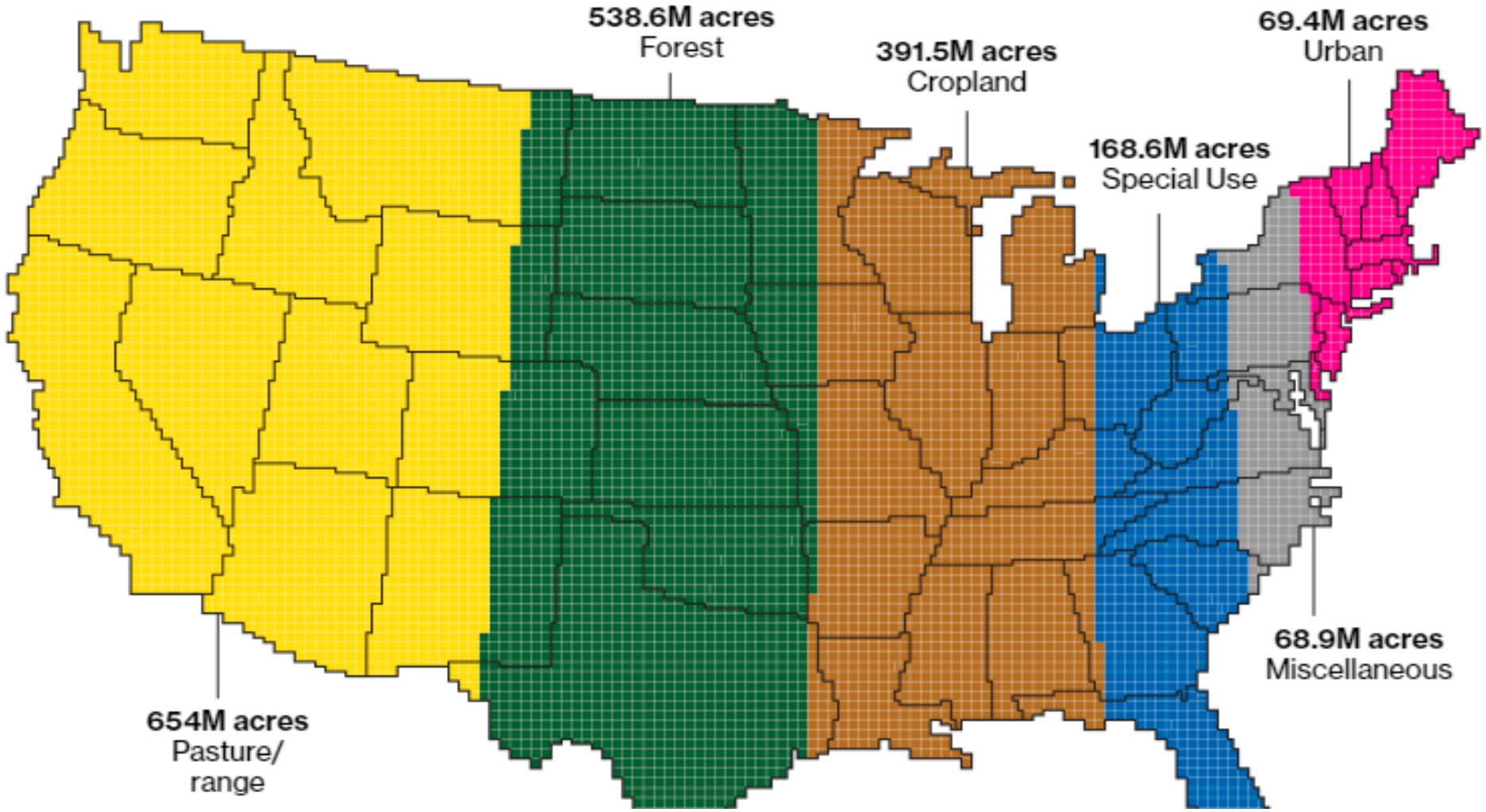

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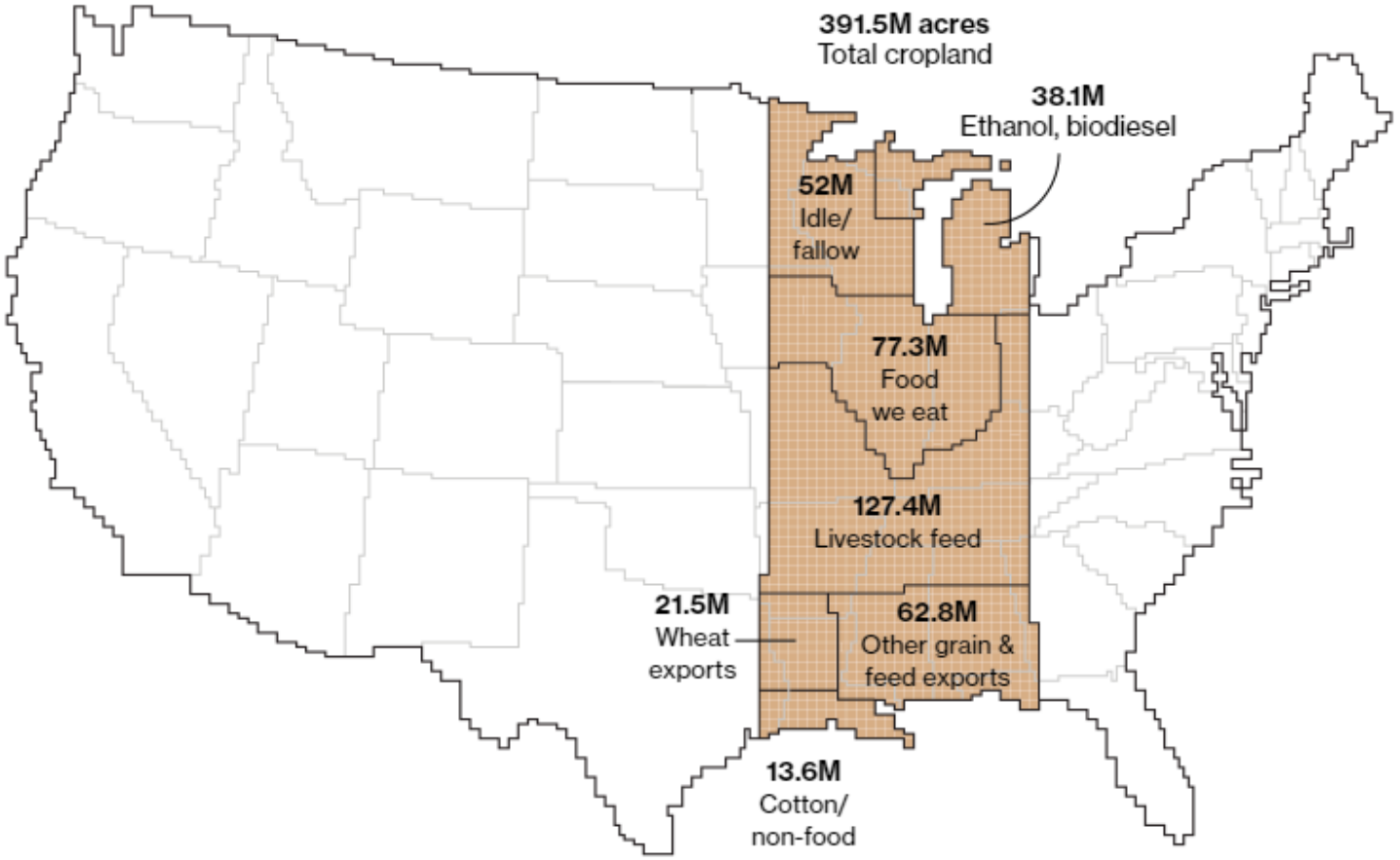

Source: https://www.bloomberg.com/graphics/2018-us-land-use/

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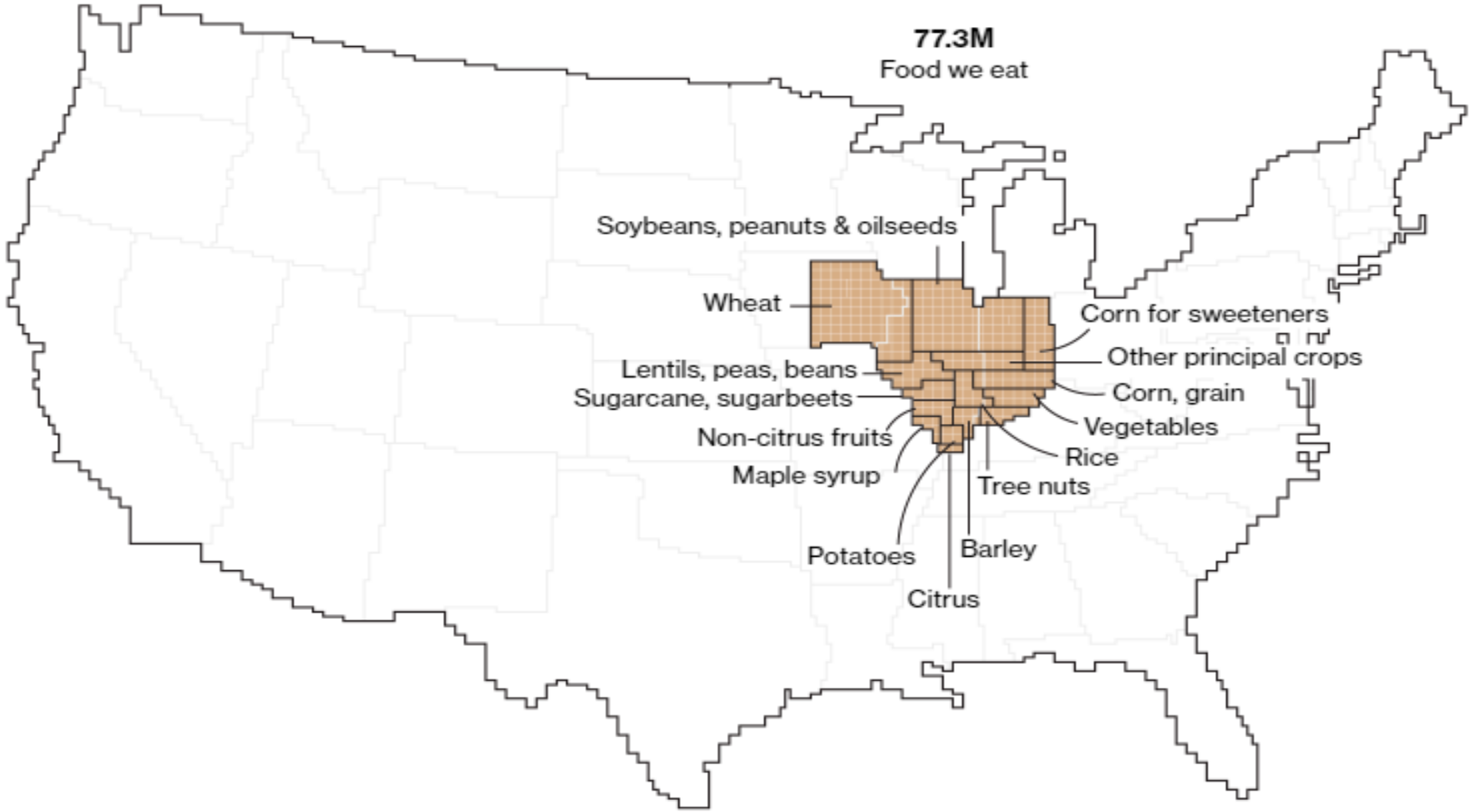

Source: https://www.bloomberg.com/graphics/2018-us-land-use/

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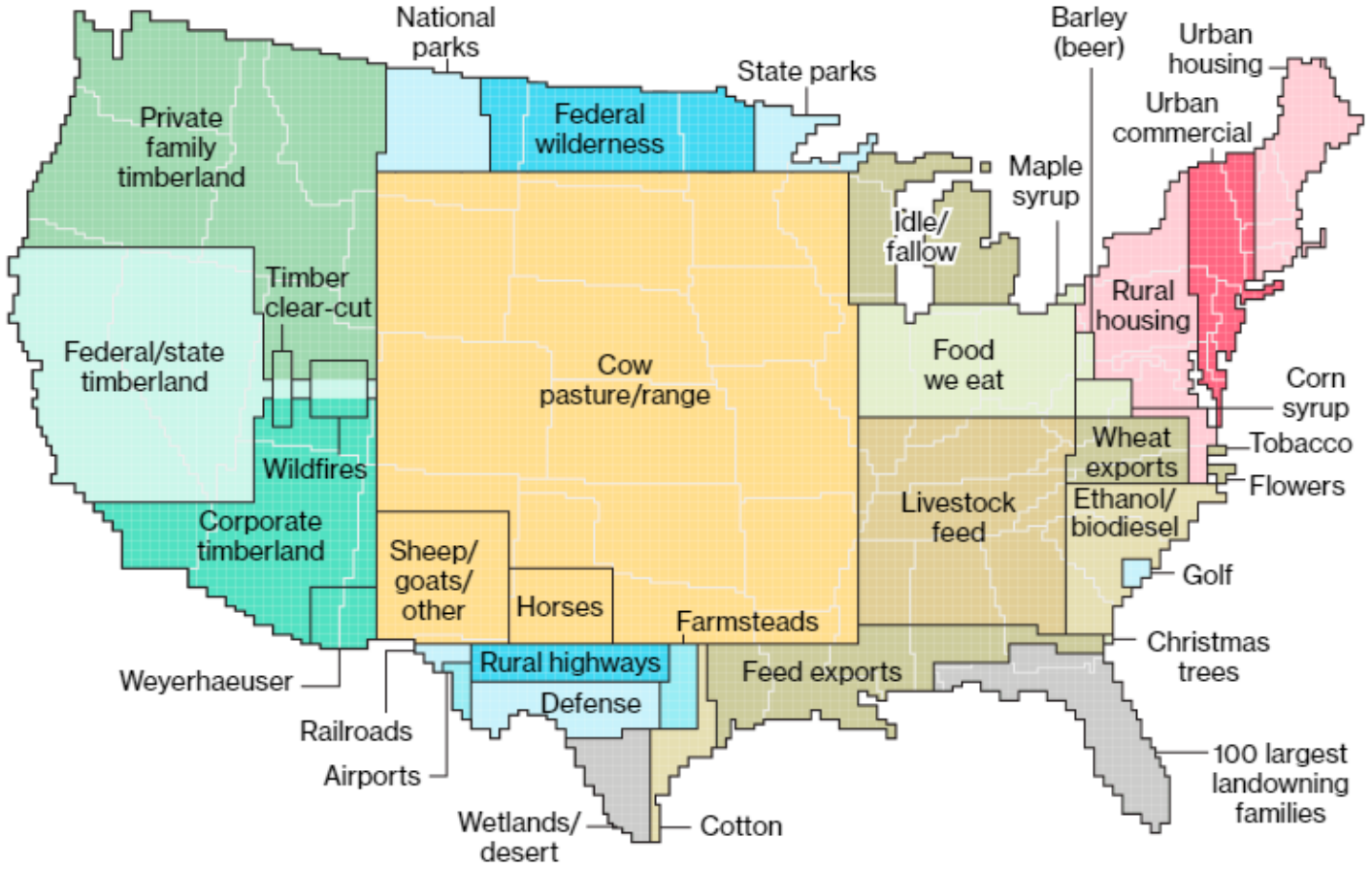
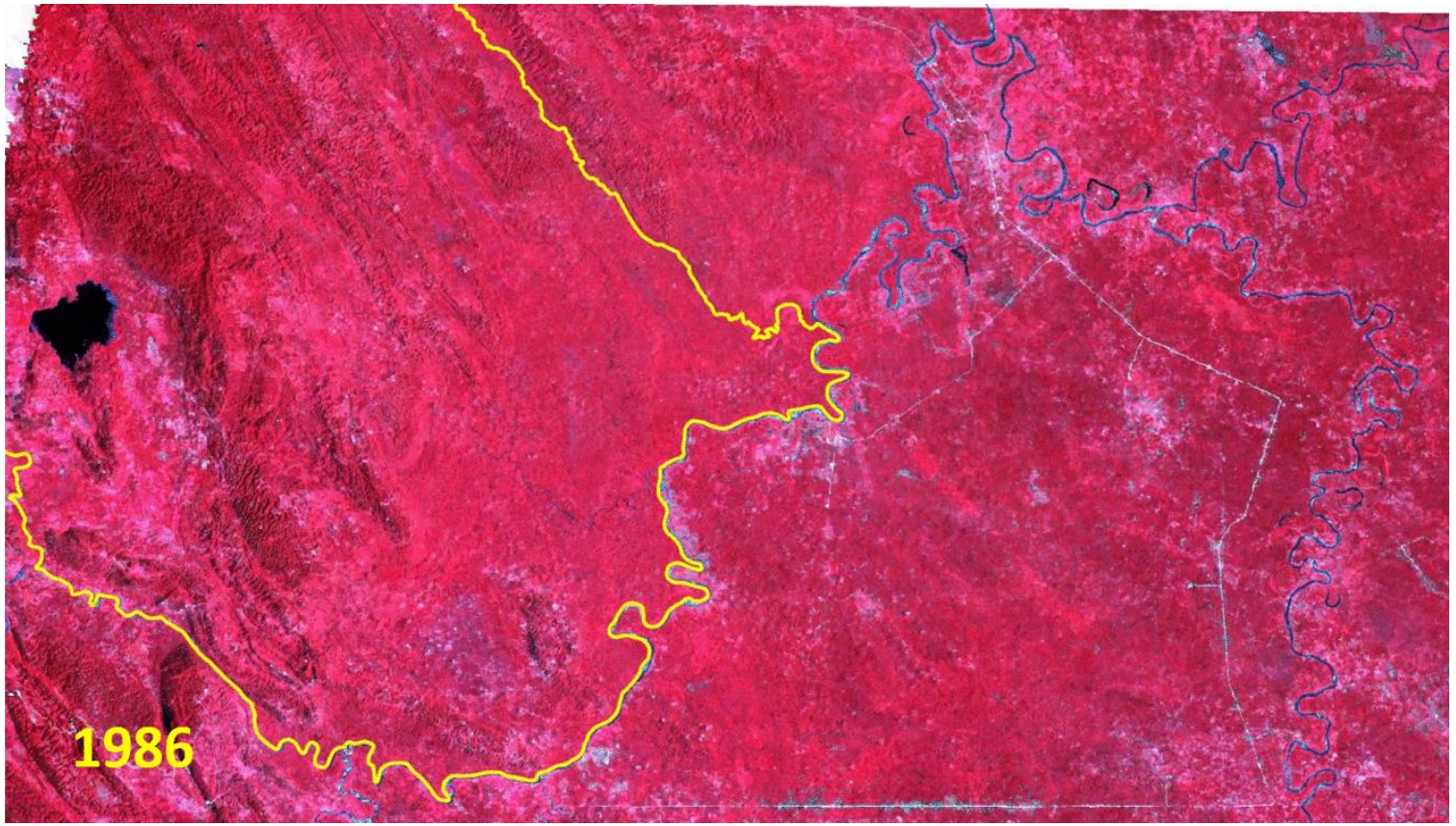


Source: https://www.bloomberg.com/graphics/2018-us-land-use/

Mexico : Assessing ecosystem condition & environmental policies



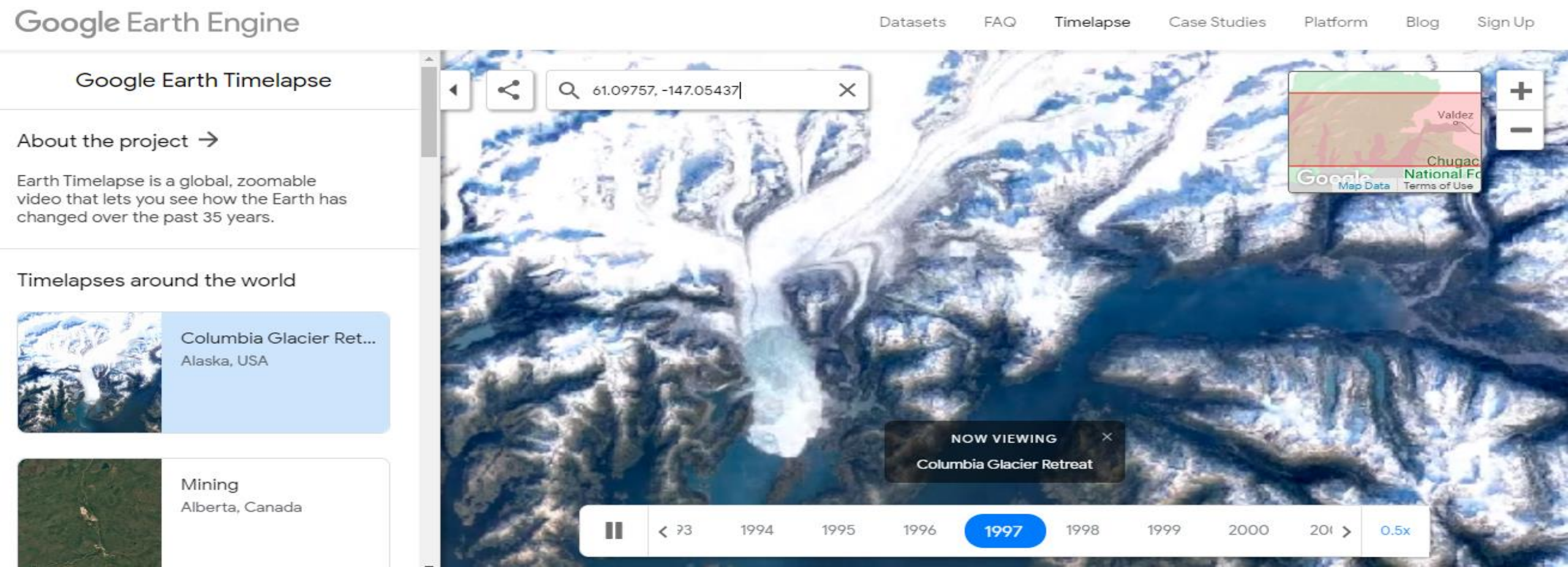
CHIAPAS
Mexico

Montes Azules Federal Protected Area

Marqués de Comillas (not protected)

Google Earth Engine Time Lapses

- https://earthengine.google.com/timelapse/



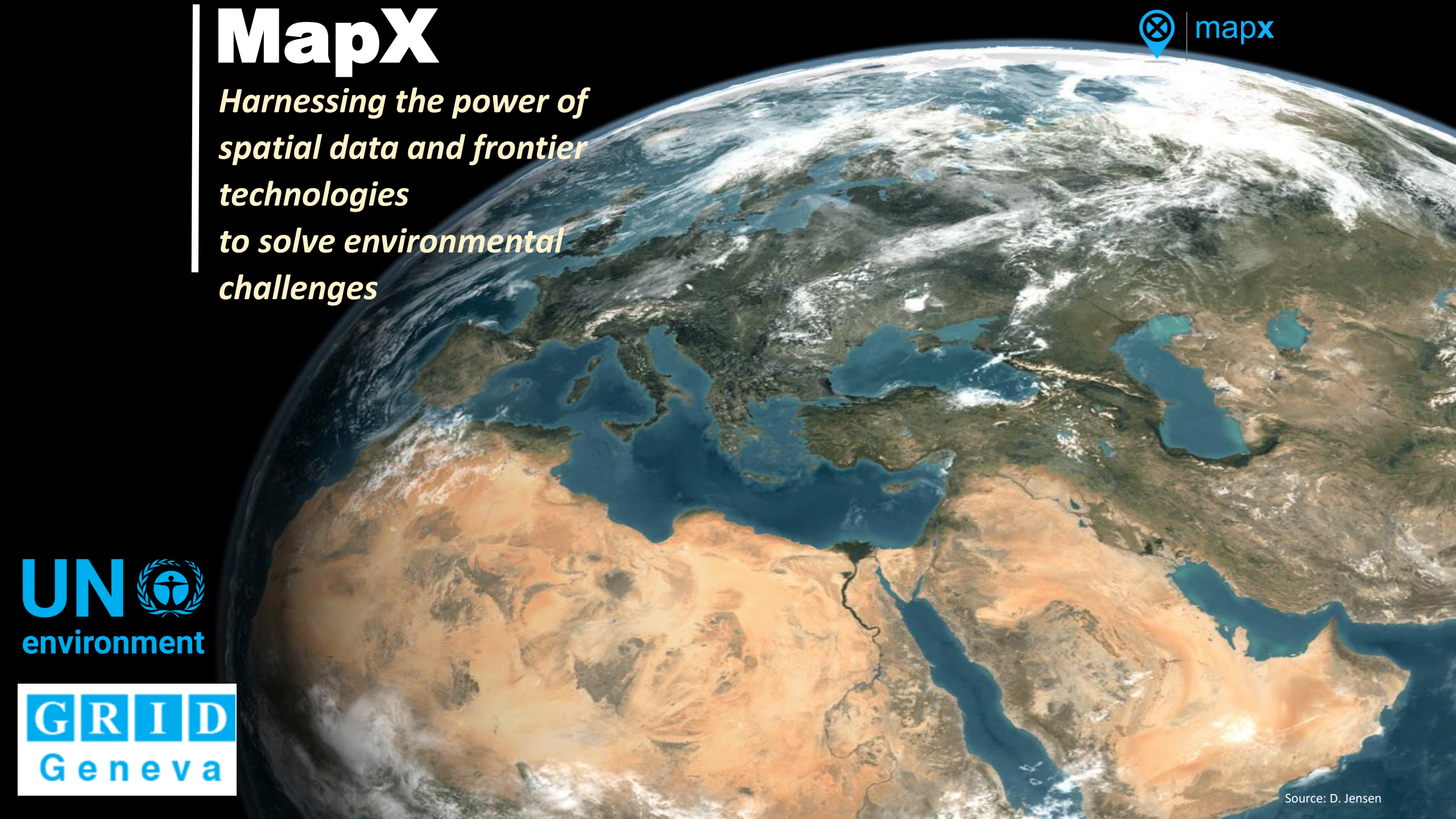
MapX

Harnessing the power of spatial data and frontier technologies to solve environmental challenges

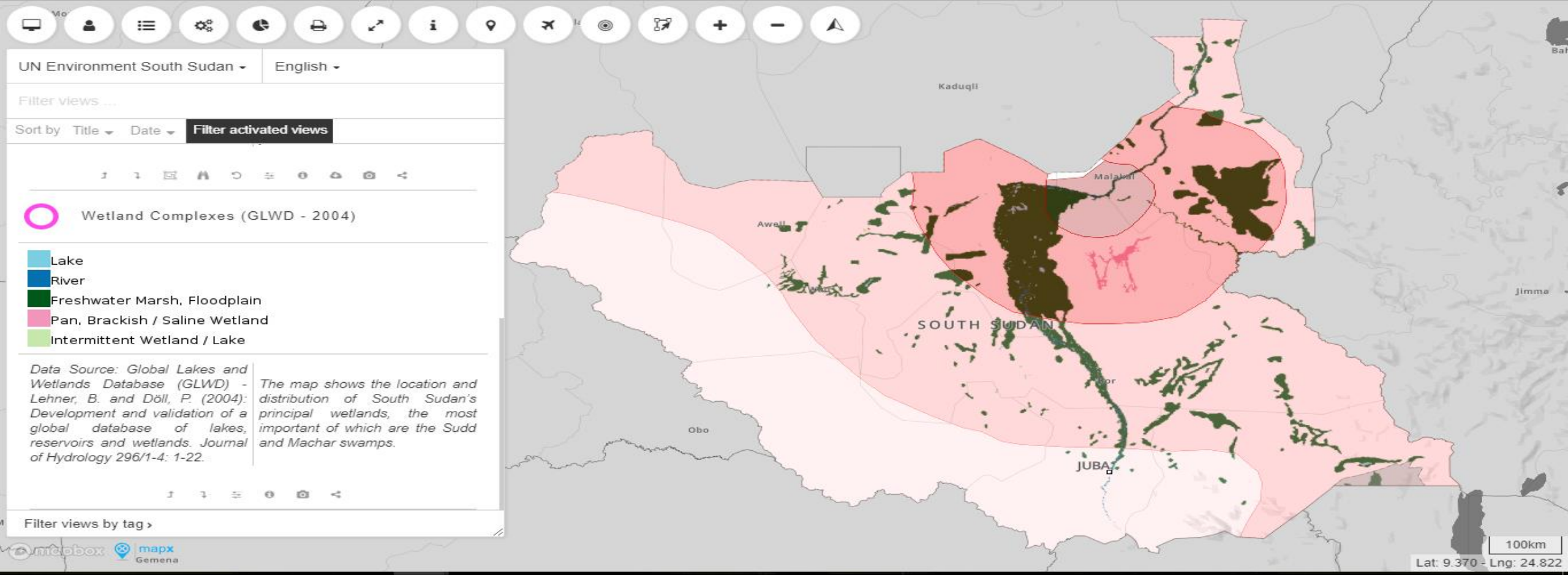
mapx

UN environment

GRID Geneva

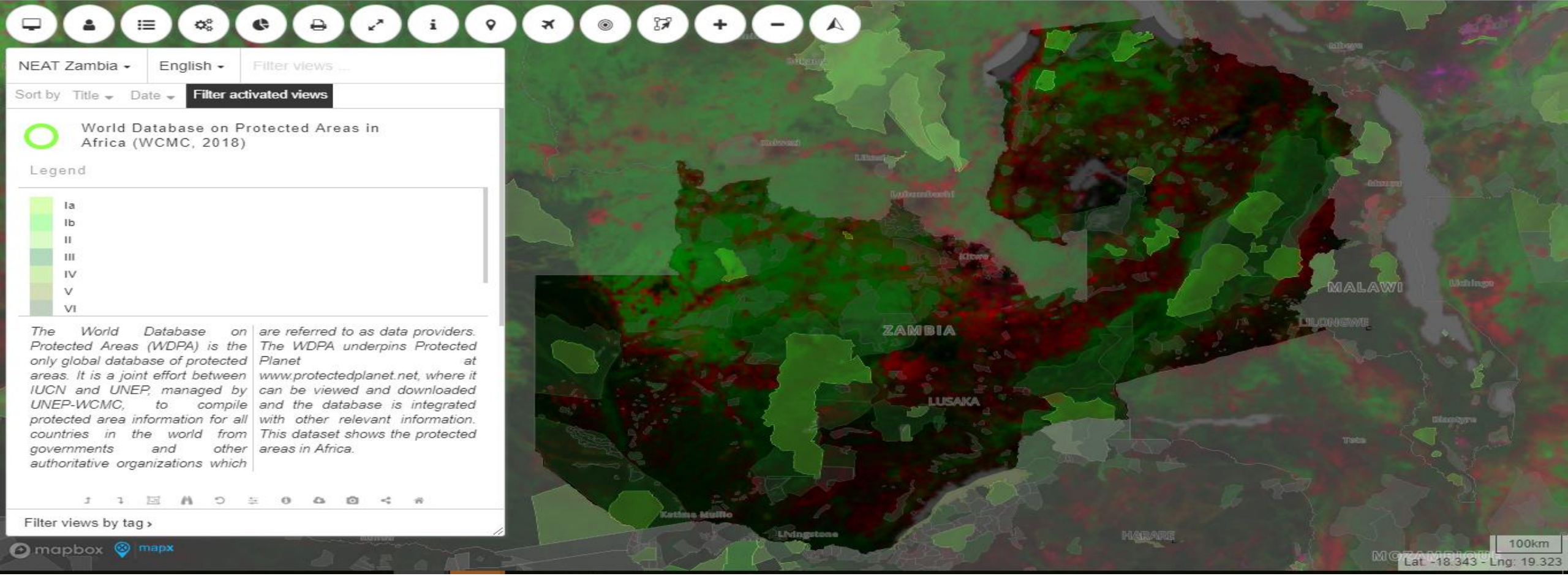


Source: D. Jensen



A statement like "*South Sudan will likely experience an average of 1 degree increase in temperature from climate change*" is **not actionable** for planning and risk reduction. Spatial data paints a different picture and offers layers of context.

The local impacts of environmental degradation and climate change are also place-specific.



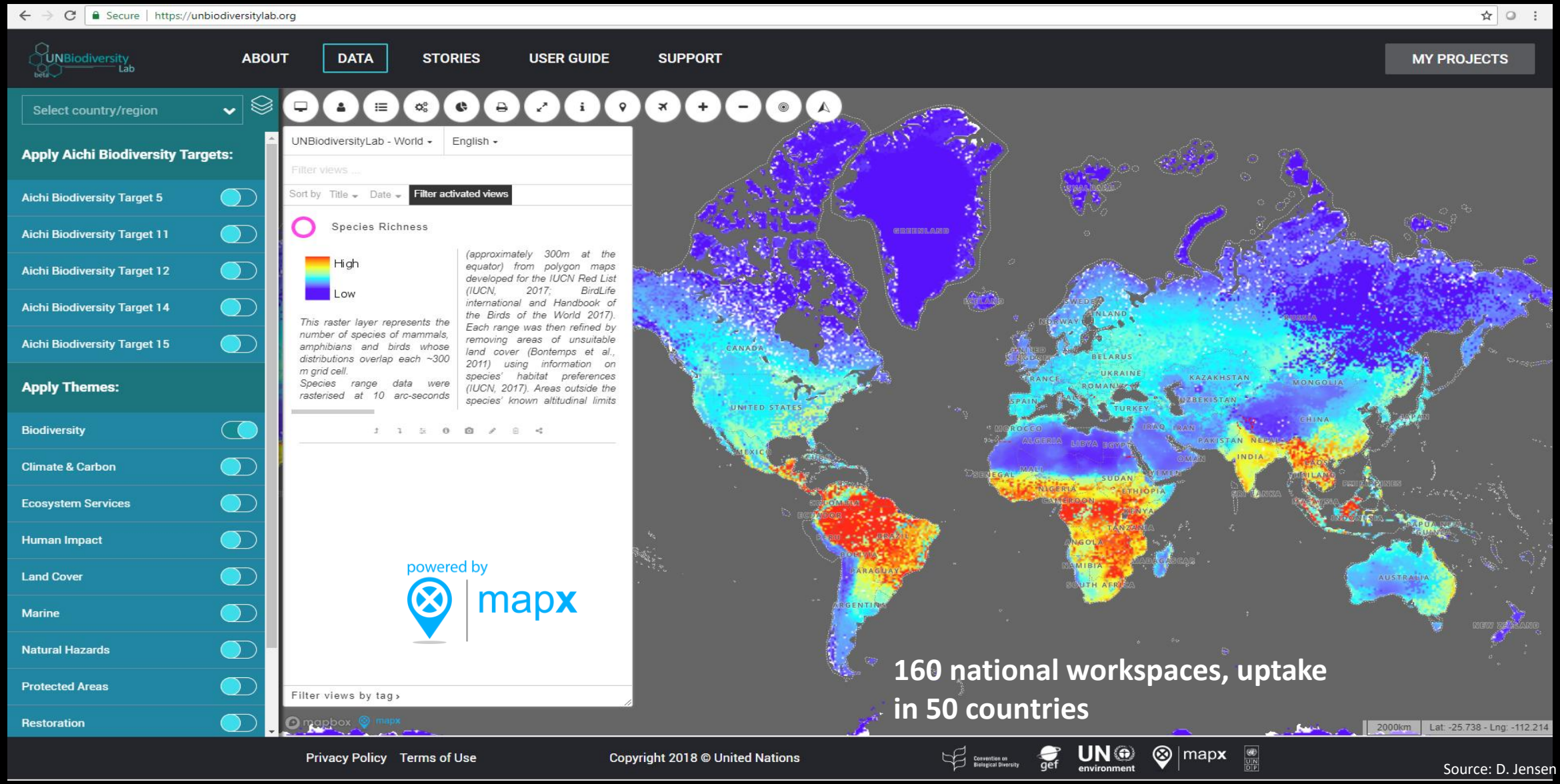
Time series statistics on deforestation levels are a good start. But the location of deforestation is critical to understand. Is it occurring within protected areas ?

The local impacts of environmental degradation and climate change are also place-specific.

System of Environmental Economic Accounting

UN Biodiversity Lab

https://unbiodiversitylab.org/



Source: D. Jensen

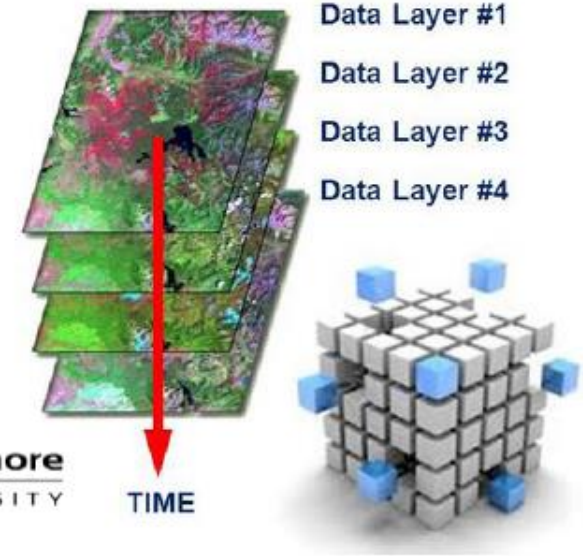
Global Partnership for Sustainable Development Data

Africa Regional Data Cube - ARDC

A data cube provides analytically ready data across decades allowing for easily accessible geospatial analysis on key issues. The initial focus for the data cube was on algorithms to address priorities identified by GPSDD partners across **5 countries**:

http://52.54.26.108/

Ghana | Kenya | Senegal l Sierra Leone | Tanzania



Strathmore UNIVERSITY

NASA

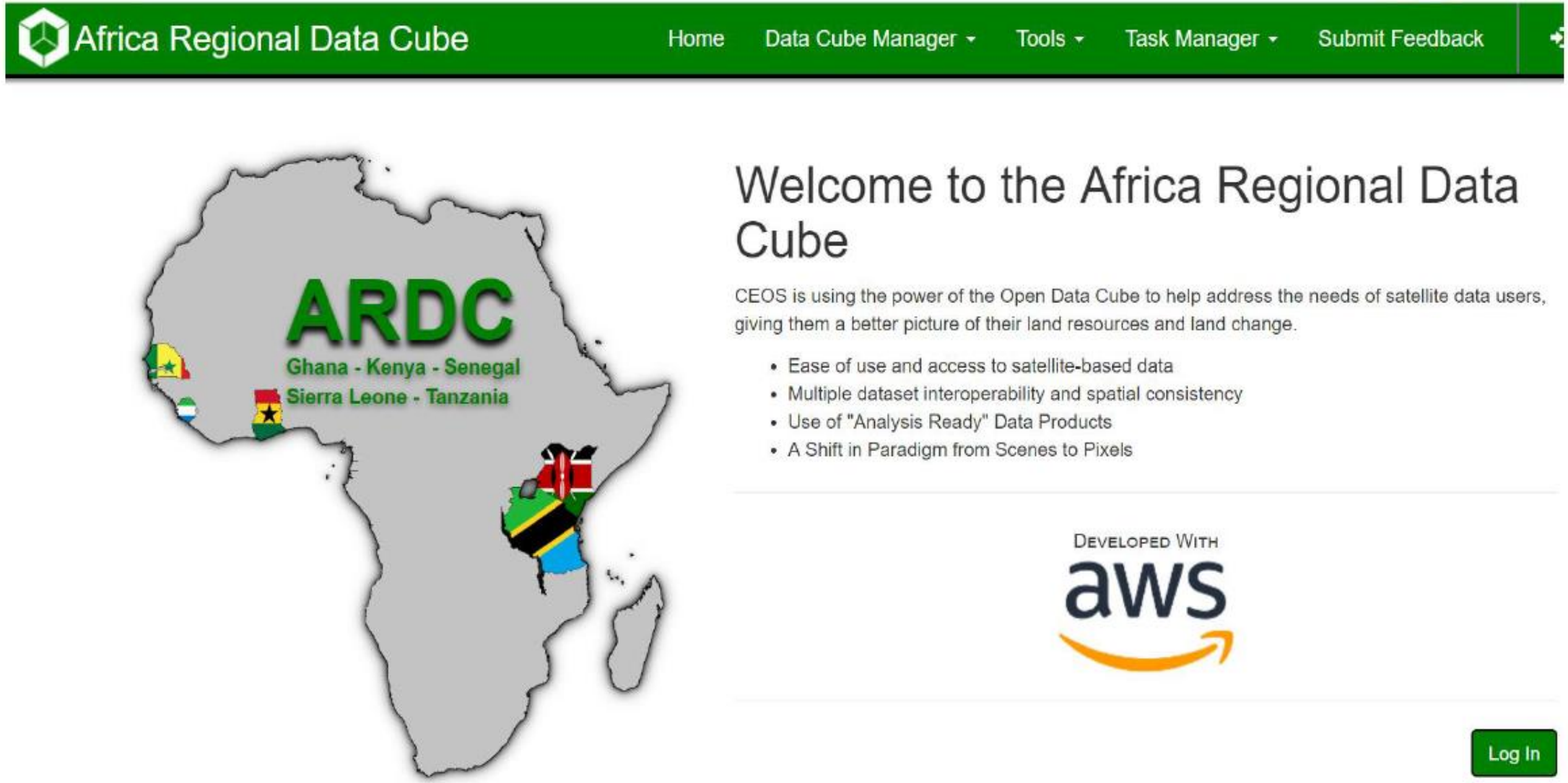
CEOS Committee on Earth Observation Satellites

esa

GEO GROUP ON EARTH OBSERVATIONS

Global Partnership for Sustainable Development Data

ARDC – User Interface



AFRICA REGIONAL DATA CUBE

http://52.54.26.108/ 52.44.32.142

Global Partnership for Sustainable Development Data

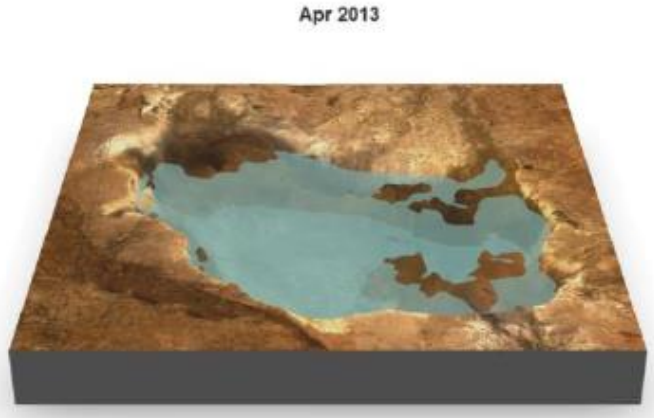
SDG 6.6.1 - Water extent

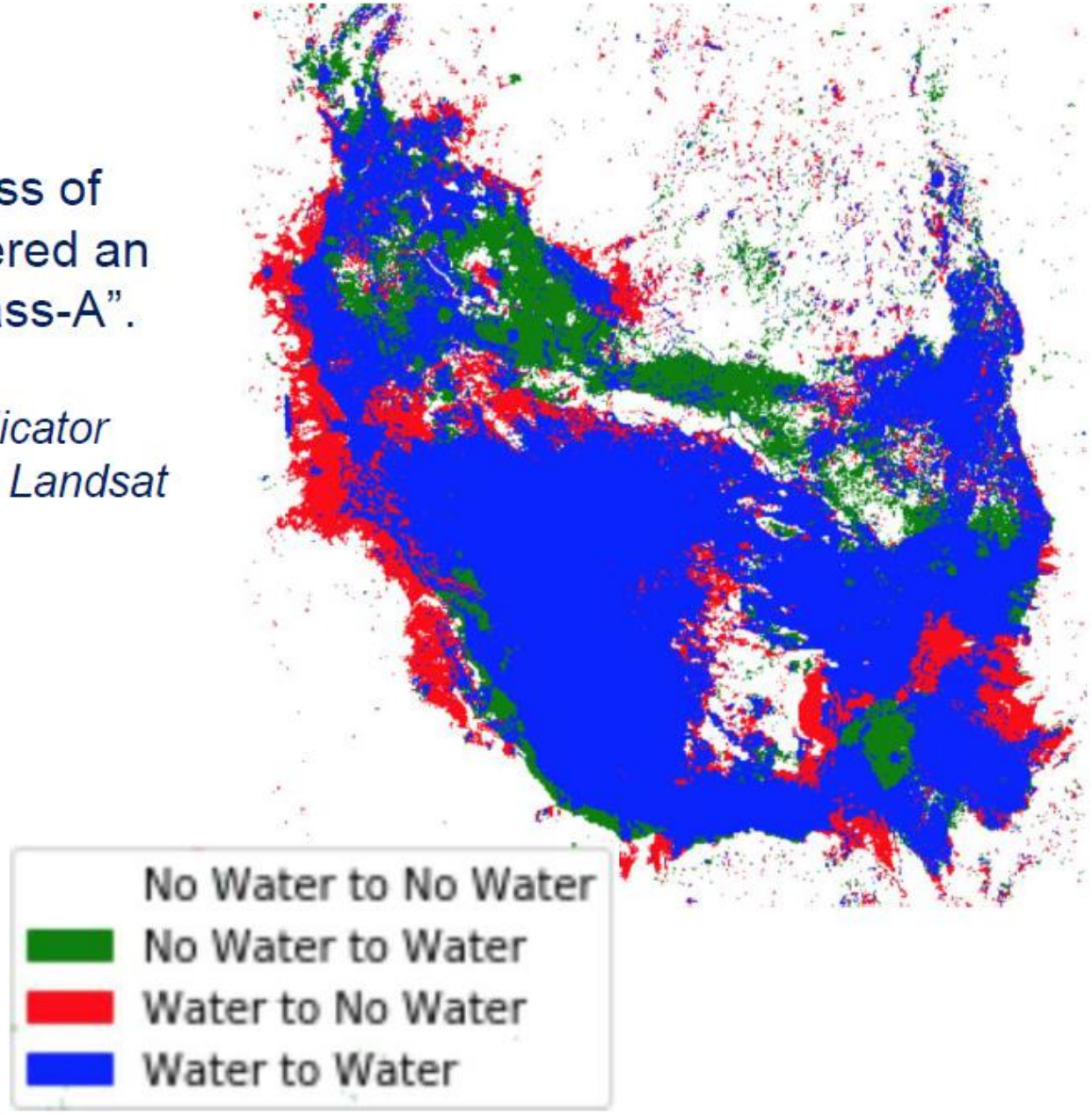
Lake Sulunga in Tanzania

From 2014 to 2018, there is a net loss of 3.8% of water pixels. This is considered an "Unmodified Natural" change or "Class-A".

Analysis followed the UN-SDG 6.6.1a indicator methodology (20 Jan 2017) and used the Landsat WOFS water detection algorithm.

6 CLEAN WATER AND SANITATION

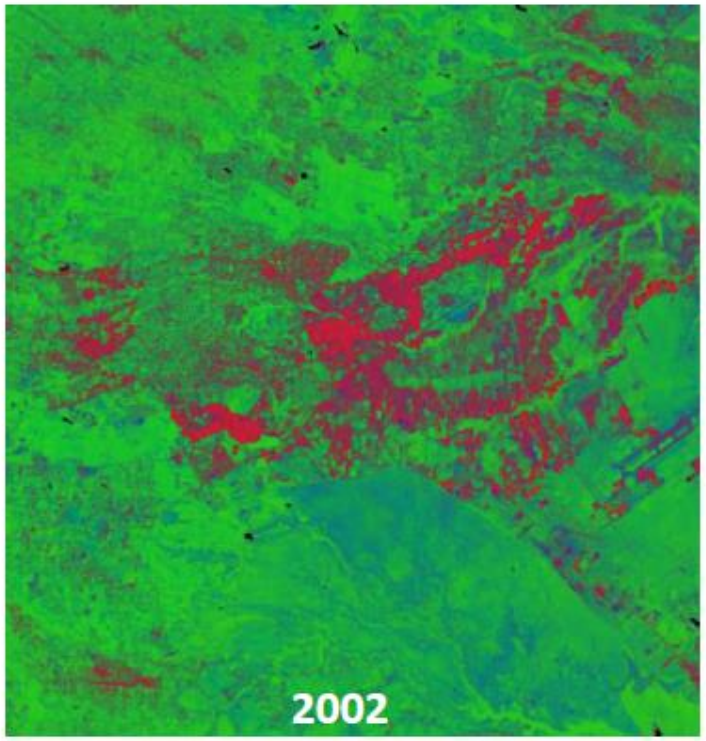


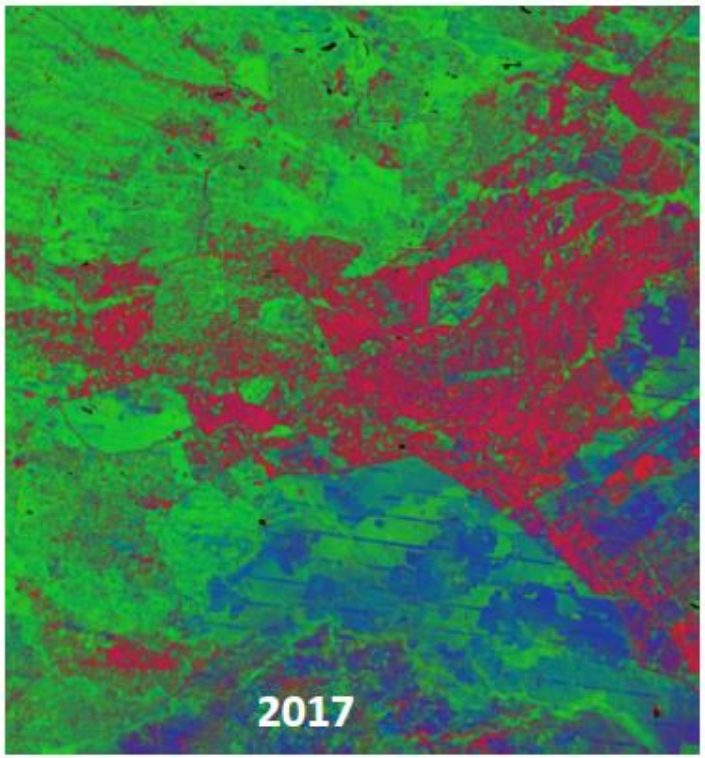


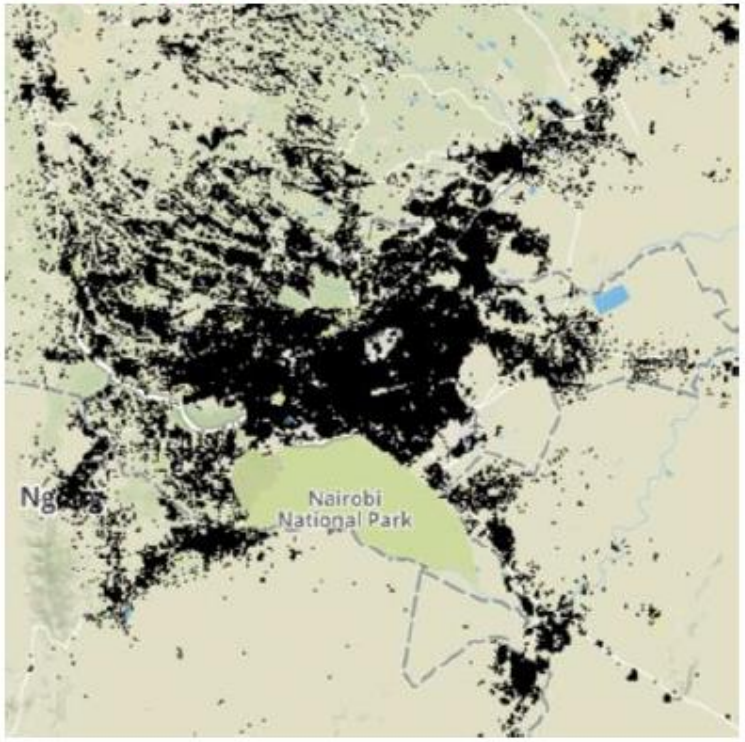
AFRICA REGIONAL DATA CUBE

Global Partnership for Sustainable Development Data

Urbanisation – SDG 11.3.1 – Nairobi, Kenya







ESA Urban Tep, WSF - 2015

Urbanization in Nairobi, Kenya – 2002 to 2017 (15 years)

Urban Area Growth = 6.7% per year (Landsat-7 Fractional Cover, 0.6 threshold)

Population Growth = ~ 4 % per year (according to several web sources)

SDG 11.3.1 - Ratio of land consumption rate to population growth rate

11 SUSTAINABLE CITIES AND COMMUNITIES

AFRICA REGIONAL DATA CUBE

Resources

https://datavizcatalogue.com/

https://www.ted.com/talks/david_mccandless_the_beauty_of_data_visualization.htmlVideoHans/discussion

https://www.ted.com/talks/hans_rosling_at_state?language=en

MapX: https://www.mapx.org/knowledge_base/

https://www.vizzuality.com/

Open Data Cube (ODC) Website: https://opendatacube.org

ODC Application Library:https://opendatacube.org/dcal

ARDC User Interface: http://52.54.26.108/

European Commission

UN environment

United Nations

System of Environmental Economic Accounting