

M U N I
S C I

ZA231 Advanced cartographic visualisation

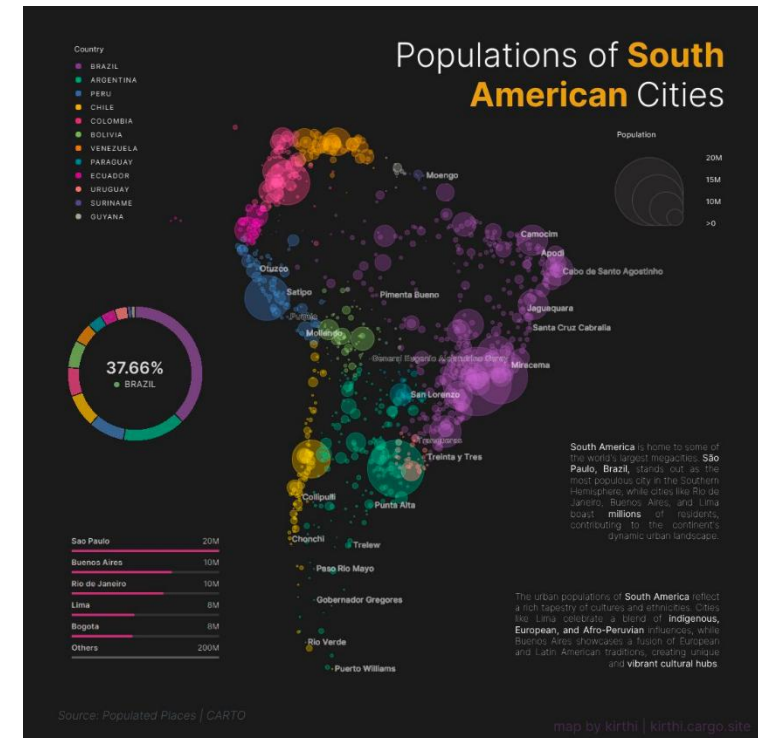
Department of Geography, Faculty of Science, Masaryk University

Assoc. Prof. Zdeněk Stachoň
Prof. Petr Kubíček
Dr. Lukáš Herman
Dr. Dajana Snopková

zstachon@geogr.muni.cz, herman.lu@mail.muni.cz

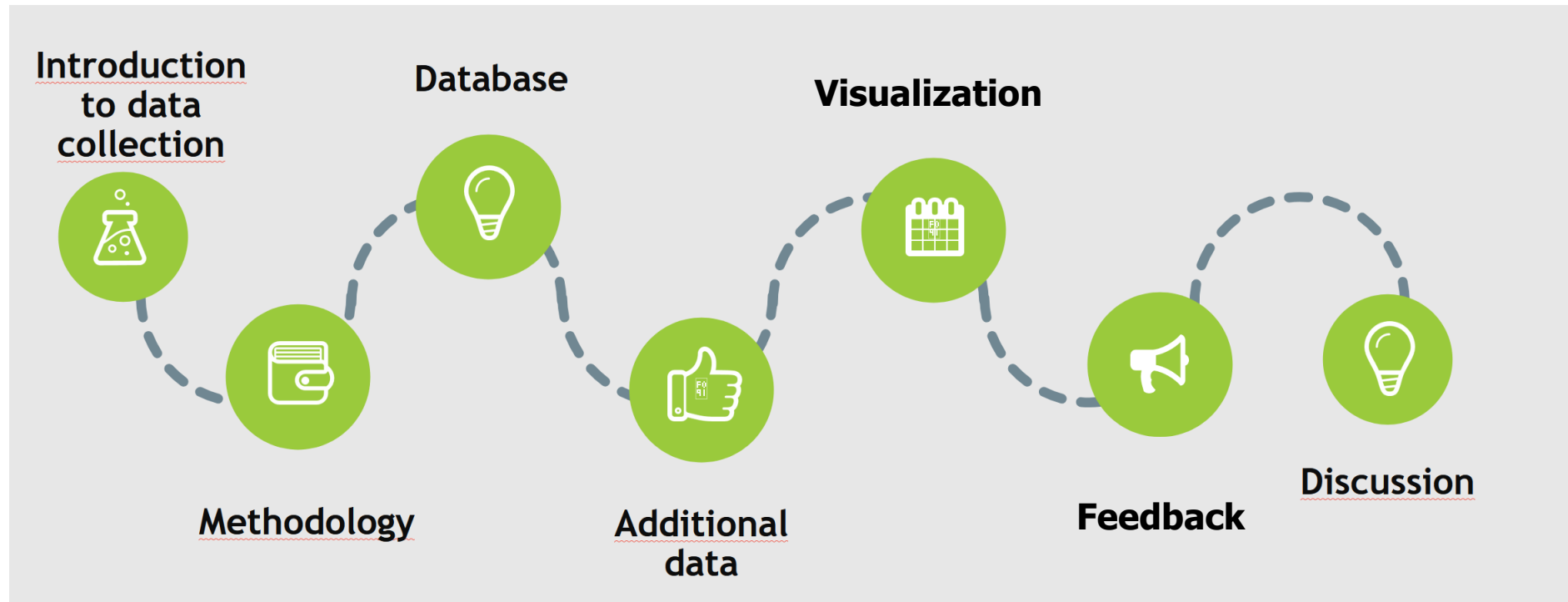
Aims

- The course is focused on the fundamentals, advantages, and limitations of selected advanced methods of **cartographic visualization**
- Attention will be paid to the specific **data sources** and also to the **methods of data processing**.
- The topic of **user aspects** (UX – User eXperiences) will be covered.



Outline

- Theoretical lesson
 - Classroom: **Z3**
 - **Thursday 3pm**
- Practical lesson
 - Classroom: **Z7**
 - **Tuesday 3pm**



Agenda of theoretical lessons

Thursday
3pm – 4pm

Classroom: Z3

Lesson n.	Date	Topic
1	February 20	Introduction
2	February 27	Presentation of the DHF database
3	March 6	Reading (there will be no lecture, self-study)
4	March 13	Methods of Analysis
5	March 20	Methods of Visualization
6	March 27	Reading (there will be no lecture, self-study)
7	April 3	Uncertainty visualization
8	April 10	Reading (there will be no lecture, self-study)
9	April 17	Review of the curriculum, quiz, ...
10	April 24	Lecture by a foreign expert
-	May 1	National holiday (there will be no lecture)
-	May 8	National holiday (there will be no lecture)
	??	Exam (presentation + feedback)

} preliminary plan;
will be specified

Agenda of practical lessons

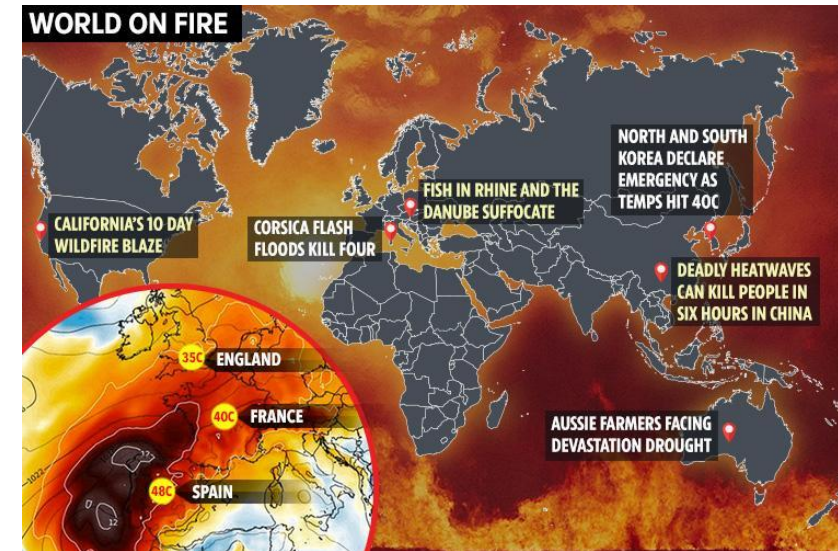
Tuesday
3pm – 5pm

Classroom: Z7

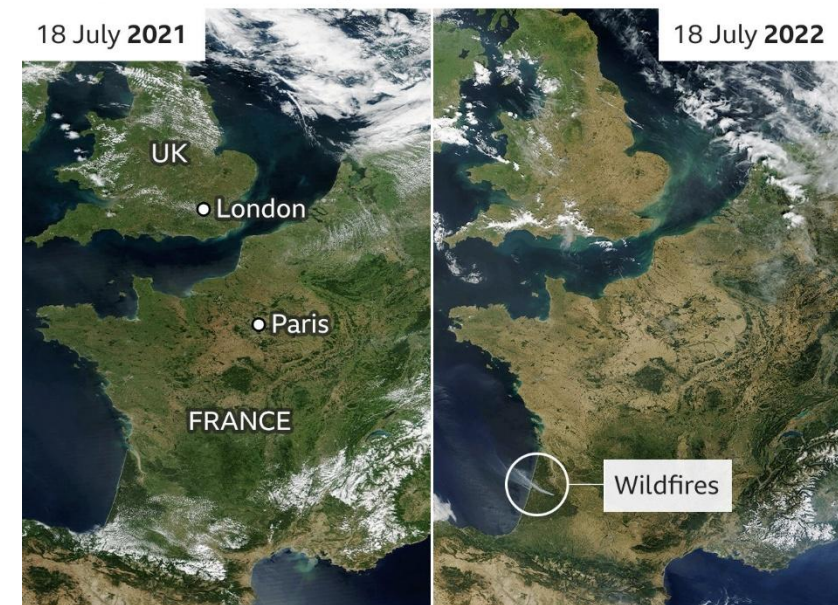
Lesson n.	Date	Topic
-	February 18	There was no lecture
1	February 25	PL n.0 – Repeating work in ArcGIS Pro
2	March 4	PL n.1 – Data + research question
3	March 11	PL n.1 – Consultation
4	March 18	PL n.2 – Analysis, visualization
5	March 25	PL n.2 – Consultation
6	April 1	PL n.3 – Uncertainty visualization
7	April 8	PL n.3 – Consultation
8	April 15	PL n.4 – ArcGIS Story map
9	April 22	PL n.4 – Consultation
10	April 30	There will be no lecture – project completion, individual consultations
11	May 6	There will be no lecture – project completion, individual consultations

Visualizing global change

- Climate change is reshaping our world, and its impacts are increasingly visible through extreme events like wildfires, droughts and heatwaves
- Advanced cartographic visualization provides powerful tools to understand, analyse, and communicate these complex phenomena
- Why is **cartographic visualization** crucial?
 - **Enhanced understanding:** Maps reveal spatial patterns and relationships that are often hidden in tables and graphs
 - **Effective communication:** Visualizations can convey complex information to diverse audiences, including policymakers, scientists, and the public
 - **Data-driven decisions:** By visualizing climate change related data, we can identify vulnerable areas, assess risks, and develop targeted mitigation and adaptation strategies



UK and France turning brown as heatwave hits, satellite images show



Map Options

- Human Settlement Layer
- Protected Areas Layer
- Corine Land Cover
- FUELS

Forecasts

FIRE DANGER FORECAST

Source: ECMWF (8 km res.)

Index: Fire Weather Index (FWI)

Date: 09 Aug 2023

Rapid Damage Assessment

Select a date-range

Last 1 Day | Last 7 Days | Last 30 Days

From: 20 Feb 2024 To: 21 Feb 2024

ACTIVE FIRES

MODIS VIIRS

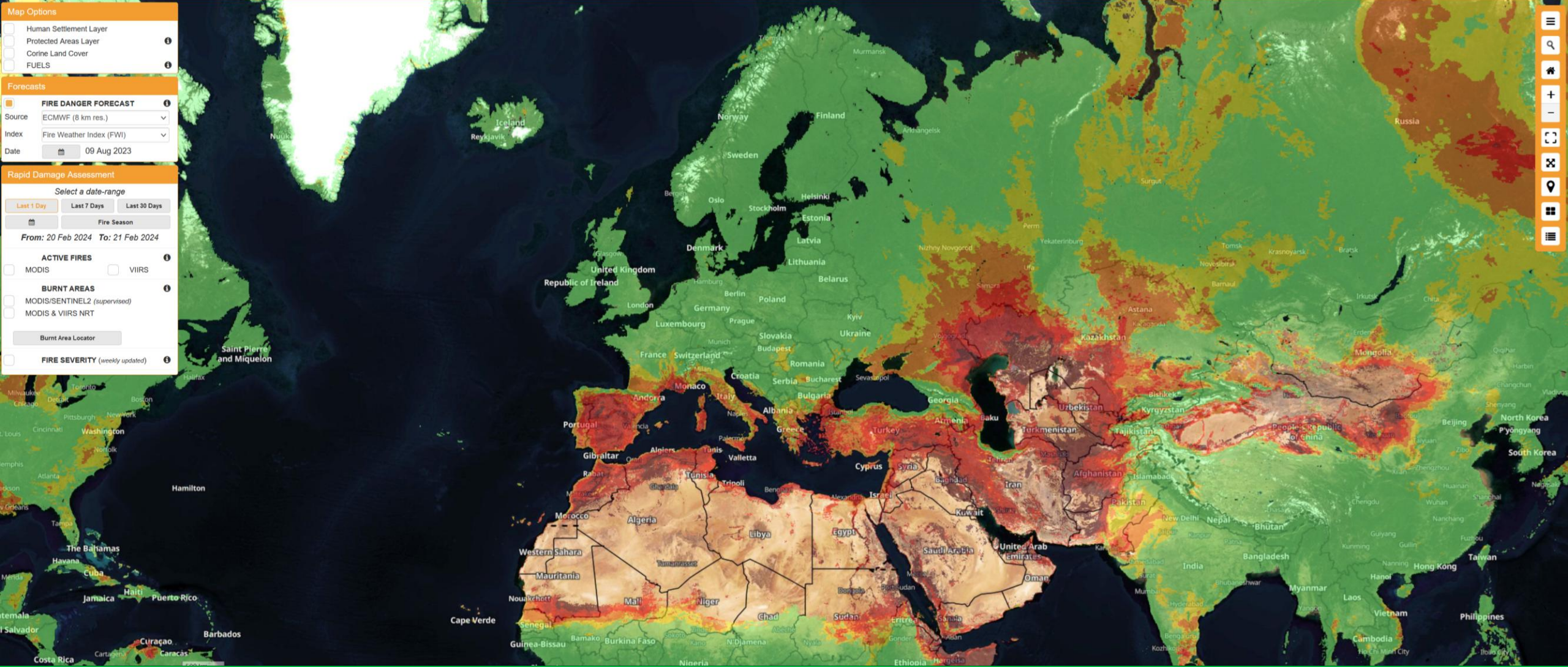
BURNT AREAS

MODIS/SENTINEL2 (supervised)

MODIS & VIIRS NRT

Burnt Area Locator

FIRE SEVERITY (weekly updated)





European Forest Fire Information System EFFIS

Welcome to EFFIS

EFFIS - European Forest Fire Information System - supports the services in charge of the protection of forests against fires in the EU and neighbor countries and provides the European Commission services and the European Parliament with updated and reliable information on wildfires in Europe. The fires mapped in EFFIS may include fires set intentionally for the purpose of vegetation management.

Since 1998, EFFIS is supported by a network of experts from the countries in what is called the [Expert Group on Forest Fires](#), which is registered under the Secretariat General of the European Commission. Currently, this group consists on experts from 43 countries in European, Middle East and North African countries. In 2015, EFFIS became one of the components of the [Emergency Management Services](#) in the EU Copernicus program.

A number of specific applications are available through EFFIS:

New features

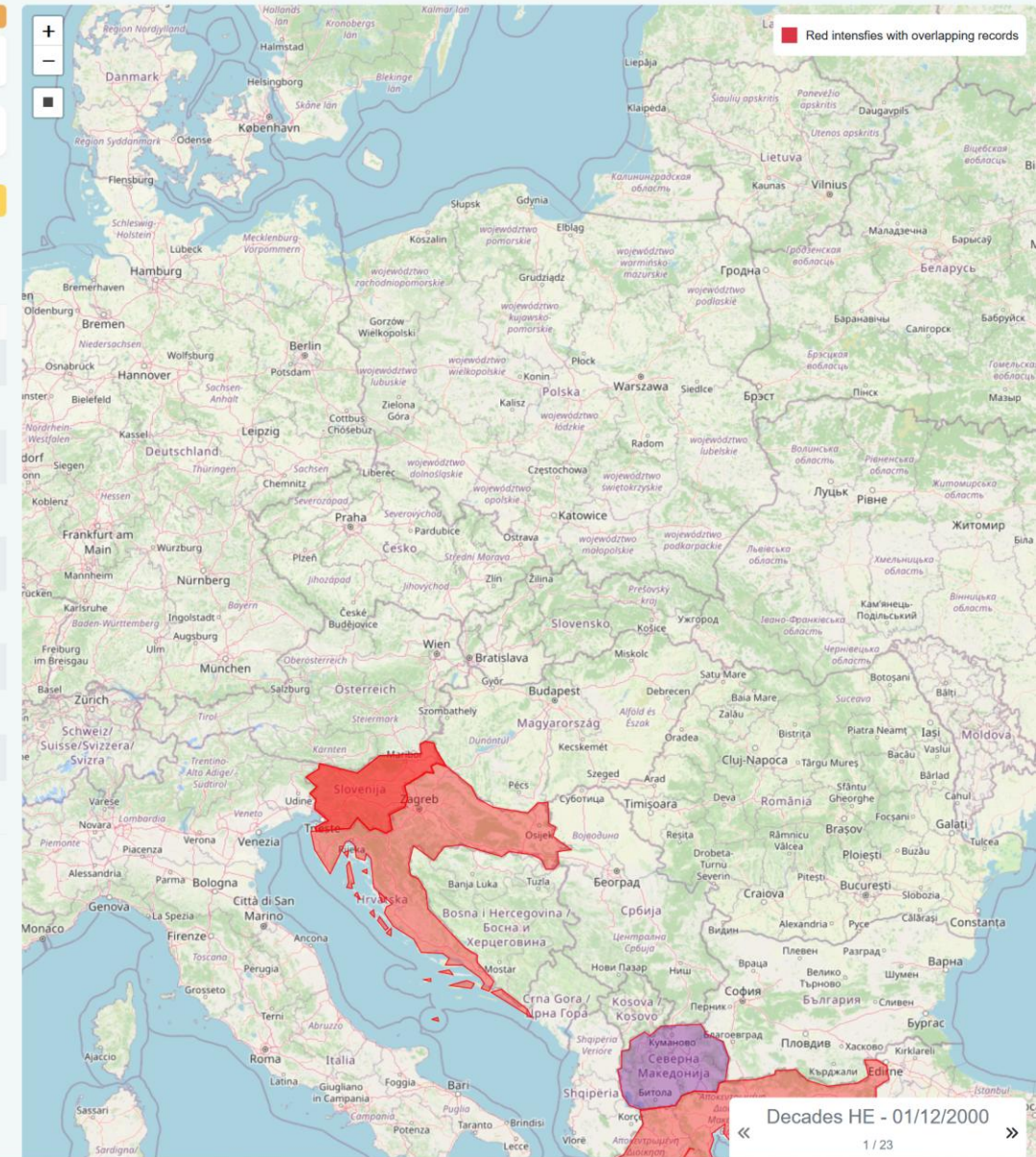
Get up-to-date countries statistics by the new [Current Statistics Portal](#)

Make your specific requests of data by the new [Data Request Form](#)

FILTERS PANEL

Textual Search: Start writing something to search...
 From (*): 01. 12. 2000 To (*): 21. 02. 2024
 Filter by area of interest: Draw a rectangle on the map
 Sector/System: -
 Severity Level: 1 - Moderate 2 - Severe 3 - Extreme
 Hazard Event: 104551
 Source Type: -
 QSEARCH

Date	System	Description	Severity	Status
01/01/2001 - 31/12/2001	Agriculture - annual crops	Reduction in crop productivity of grains	2	●
01/01/2001 - 31/12/2001	Agriculture - permanent crops	Reduction in crop productivity of grains	2	●
01/07/2001 - 30/09/2001	Agriculture - annual crops	Severe damage on field crops, meadows and fruit orchards has been detected (Matajc, 2002). The hydrological drought was ...	2	●
01/07/2001 - 30/09/2001	Agriculture - permanent crops	Severe damage on field crops, meadows and fruit orchards has been detected (Matajc, 2002). The hydrological drought was ...	2	●
01/07/2001 - 30/09/2001	Public water supply	Severe damage on field crops, meadows and fruit orchards has been detected (Matajc, 2002). The hydrological drought was ...	2	●
01/07/2001 - 30/09/2001	Public water supply	Severe damage on field crops, meadows and fruit orchards has been detected (Matajc, 2002). The hydrological drought was ...	3	●
01/07/2001 - 30/09/2001	Public water supply	Drought threatening agriculture, water supply	2	●
01/10/2001 - 31/12/2001	Public water supply	Drought threatening agriculture, water supply, the Blue Lake dried...	2	●
01/03/2001 - 31/03/2001	Public water supply	Significantly lower areas planted due to unsolved irrigation problems...	1	●
01/02/2001 - 28/02/2001	Public water supply	Water shortage alert in the water management system of the Strezevo reservoir. Also water volumes of further reservoirs ...	1	●



Scope of practical lessons

International project **Clim4cast**

Interreg
CENTRAL EUROPE



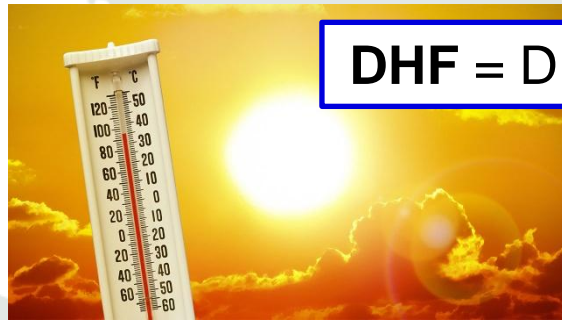
Co-funded by
the European Union

Clim4Cast

Objectives of the project

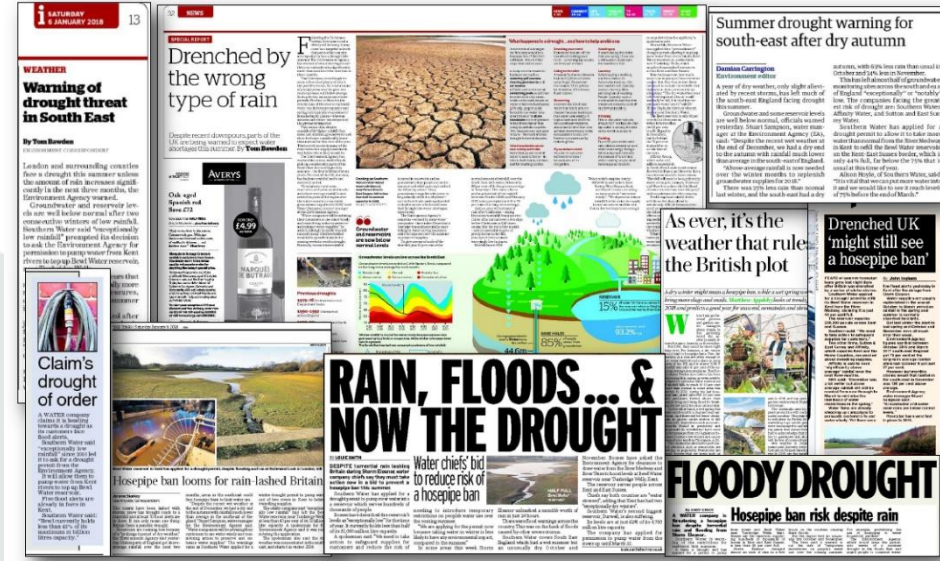
Evaluation of the spatial and temporal variability, frequency, seasonality, and intensity of the past **DHF events**, applying advanced cartographic (and statistical) methods to determine their trends

Target Area: „Central Europe“



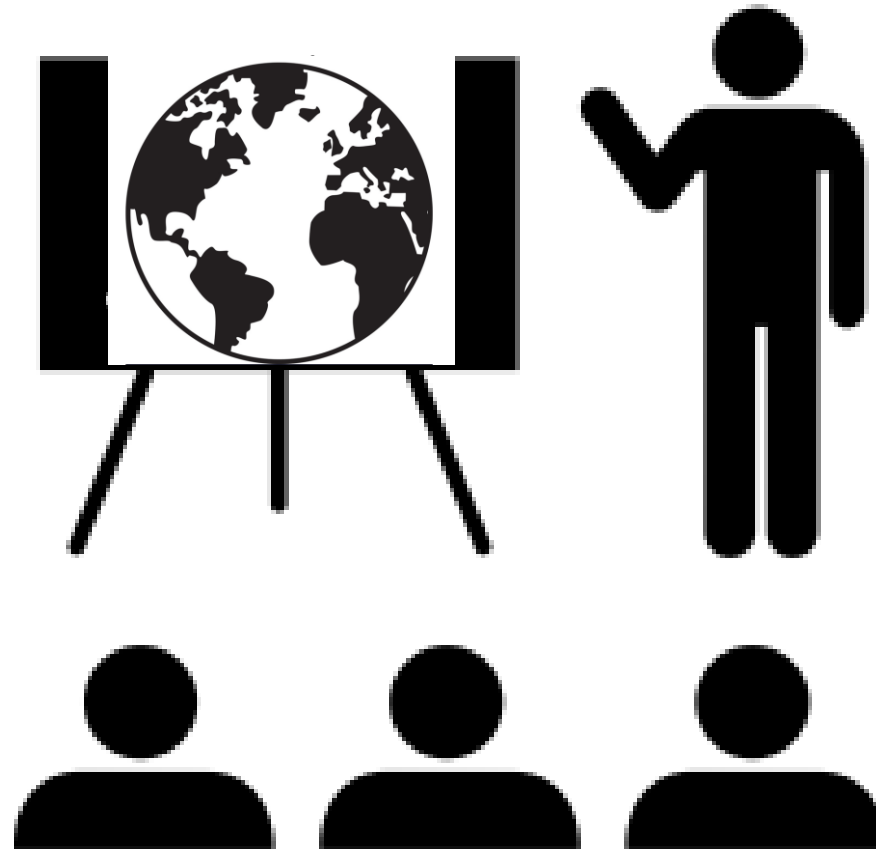
DHF = Drought, Heatwave, wildFire

UK Drought print news coverage, January 2018



Exam

- Presentation of the results
- Theoretical questions



Useful materials: GIST BoK

- **CV-01 – Cartography and Science**

- <https://gistbok-topics.ucgis.org/CV-01-001>

- **CV-26 – Cartography and Power**

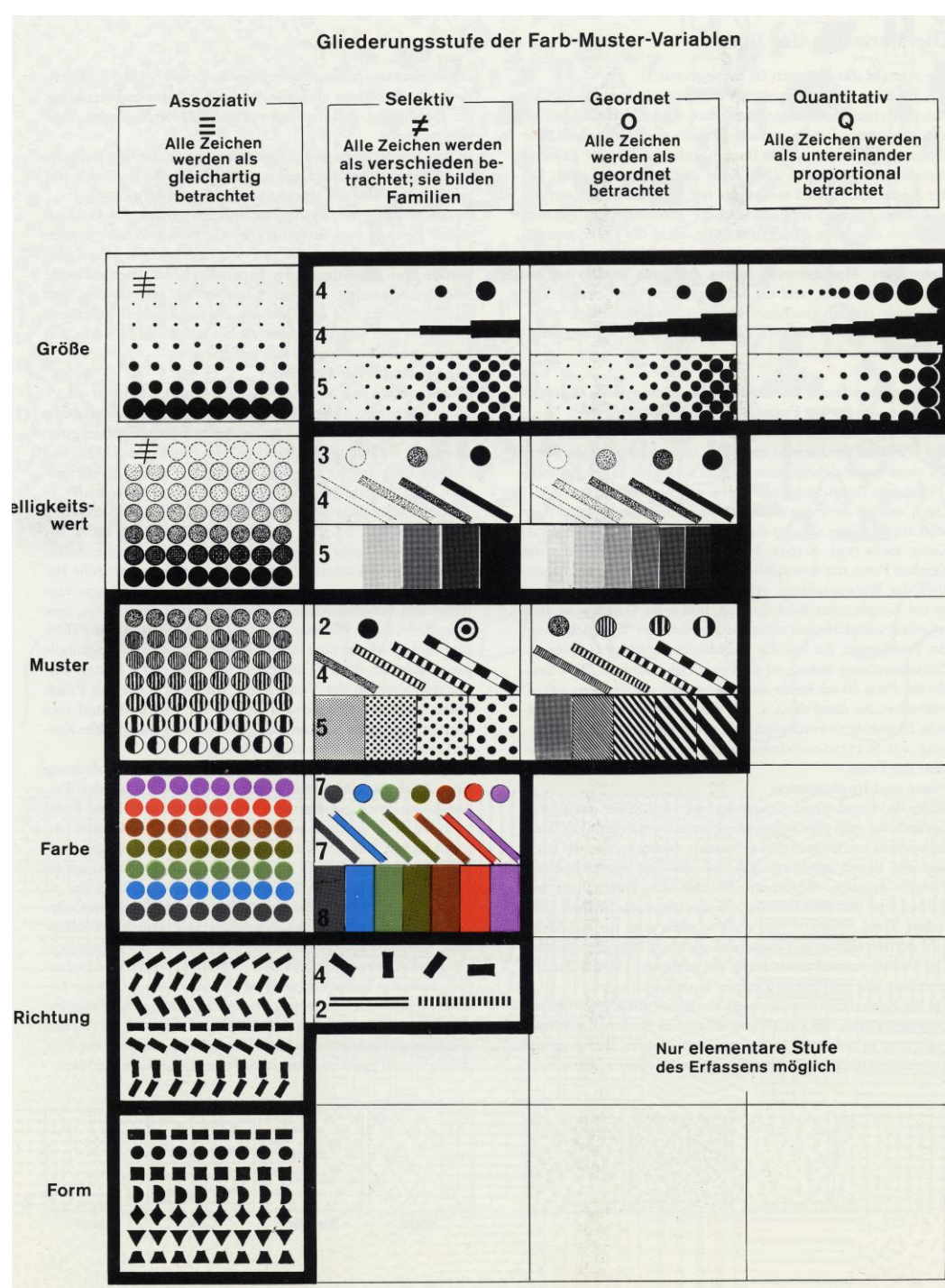
- <https://gistbok-topics.ucgis.org/CV-01-026>

- **CV-27 – Cartography and Art**

- <https://gistbok-topics.ucgis.org/CV-01-027>

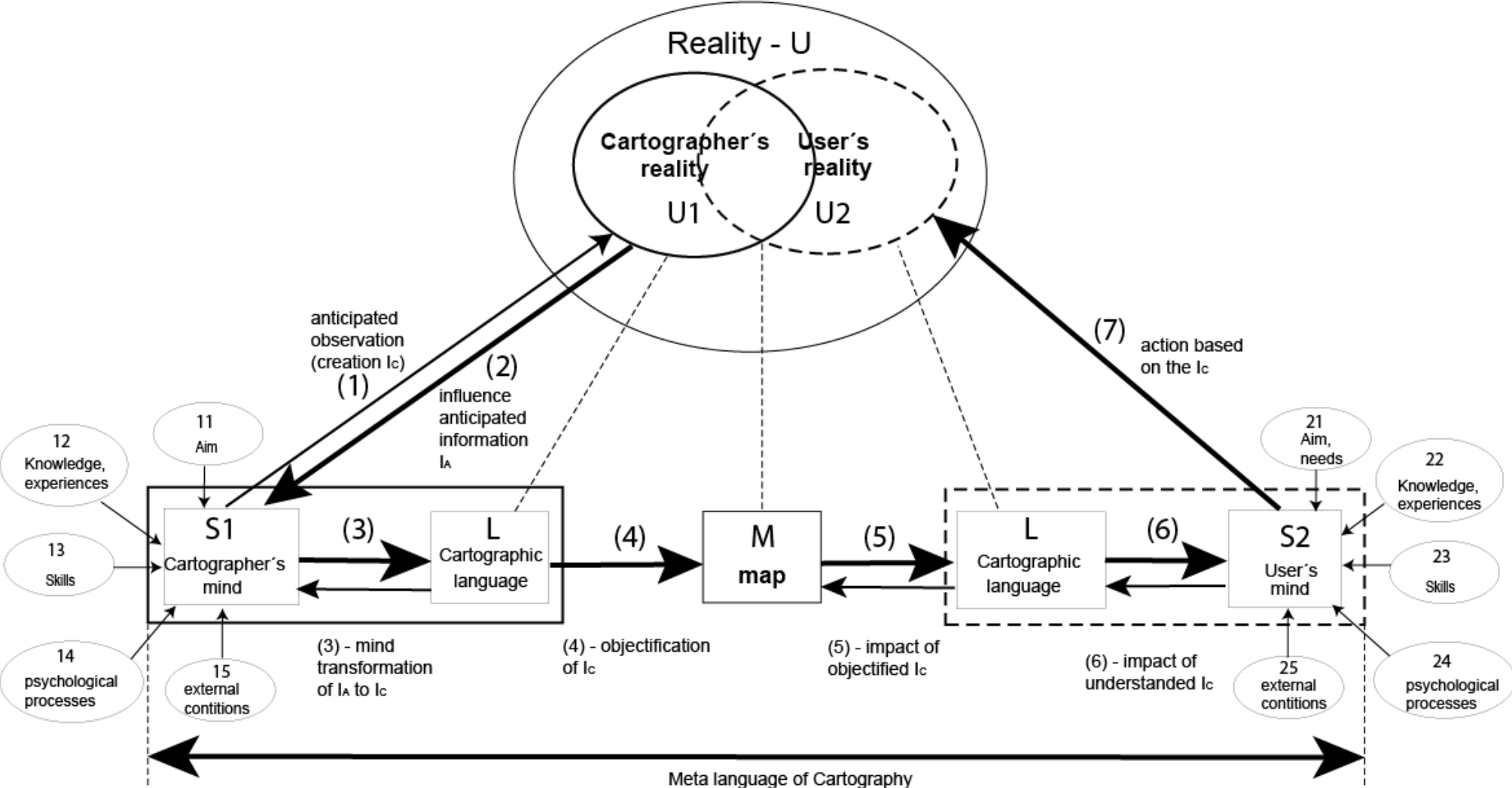
Fundamentals

More details here: <https://gistbook-topics.ucgis.org/CV-03-008>

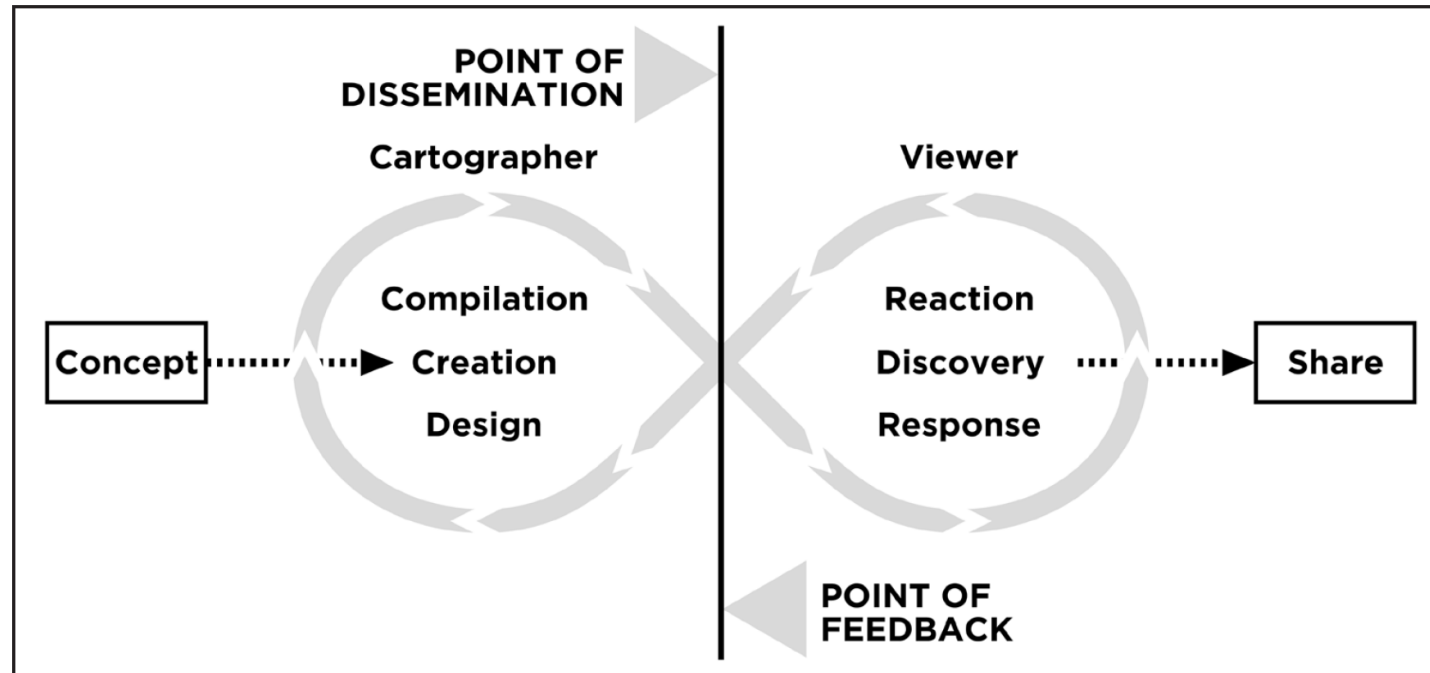


Bertin (1967)

Cartographic Communication



Cartographic Communication



Kent (2018)

Thank you for your attention!

Zdeněk Stachoň, Lukáš Herman, et al.
zstachon@geogr.muni.cz, herman.lu@mail.muni.cz