WORKSHOP

Critical Cartography in Practice:

Methods and Approaches to Analysing Maps

Leibniz-Institut für Länderkunde

Part I: Analysis Methods (20 min)

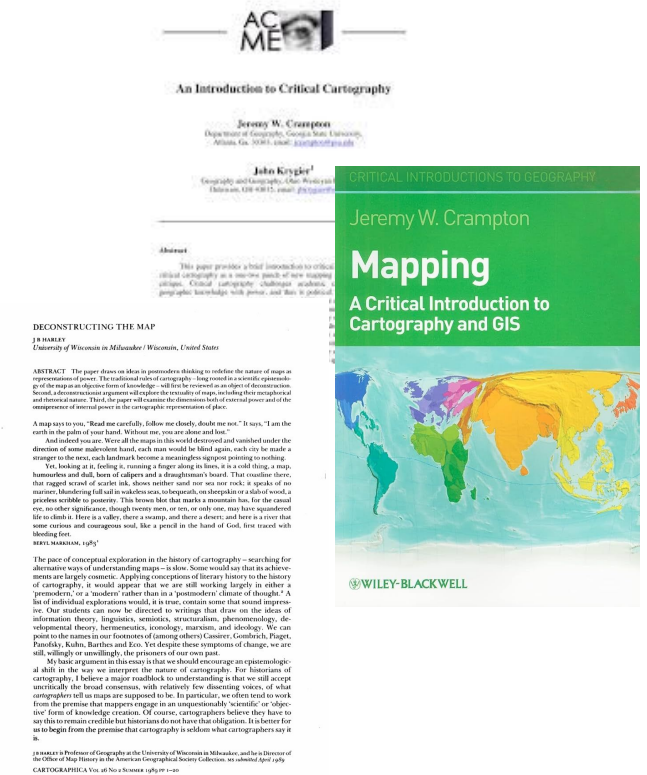
- Analysis approaches
  - Critical cartography
  - Processual cartography
  - Critical Visual Analysis
- Methods:
  - Content Analysis
  - Iconography / Semiology
  - Design Space Analysis
- Critical Map Reading
  - Map Itself
    - Topic & data
    - Symbols & design
    - Territoriality & Perspectives
  - Maps in Context

Part II: Group Analysis (1h 40 min)

- Map analysis in groups (45 min)
- Group presentations (30 min)
- Discussion (15 min)

Critical Cartography (Harley, 1982, Woods, 1992, Crampton & Kryger, 2006)

- Critical cartography “conceives of mapping as embedded in specific relations of power” meaning “mapping is involved in what we choose to represent, how we choose to represent objects such as people and things, and what decisions are made with those representations” (Crampton, 2010, 41).
- Reading maps critically by engaging with their features and beyond: projection, scale, legend, centering, but also context (e.g. logos, dates, reproductions, etc).
- Questioning maps as ‘truth’: Starting from the choice of subject matter
- Maps as social construction: They always reflect a specific worldview
- Eurocentricity: Reproducing dominant ways of seeing the world



Critical Visual Analysis (Berger, 1972; Rose, 2006; van Leeuwen & Jewitt, 2000)

- Taking images & visualisations seriously
- Thinking about how they were produced and what are their effects
- Considering positionality in interpreting visual material / ways of seeing

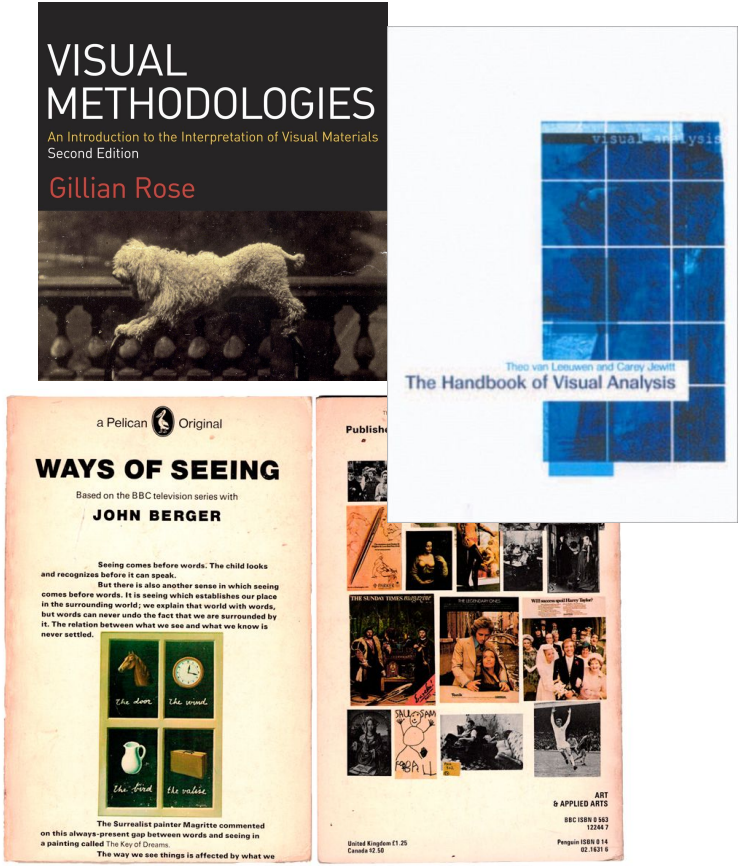
Maps as visual artifacts - their multiple meanings over time benefit from a cultural analysis approach.

Visual Analysis (Rose, 2006)

Analysis and interpretation takes place at three sites:

- Where the image (map) is produced: Map Production
- At the image (map) itself: Map Itself
- Where the image (map) is seen (by various audiences): Map Interpretation

- Three modalities at each site:
  - Technological
  - Compositional
  - Social



Three sites of visual analysis
Focus on map features
Questions / Critical approach

Questions based on Gillian Rose (2006) and Shannon Mattern's "Critiquing Maps" module:
Critiquing Maps II (wordsinspace.net)

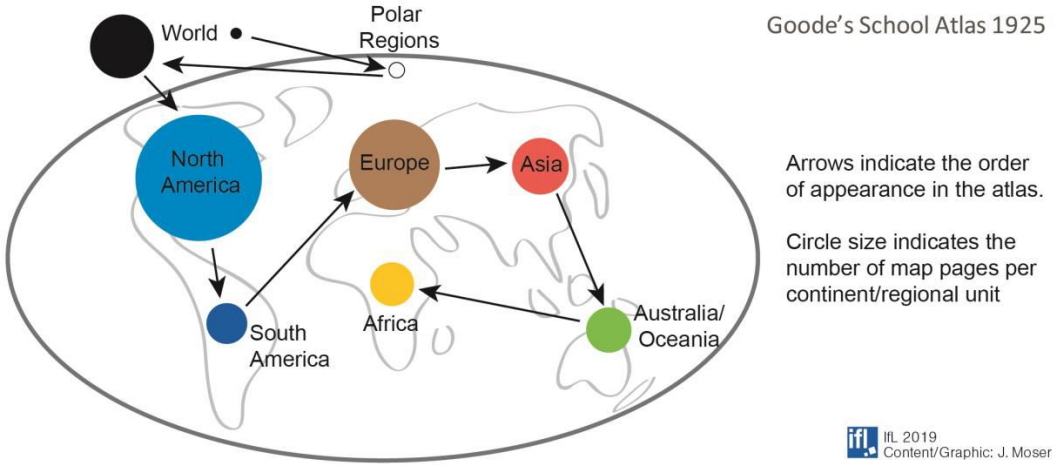
Map Itself	Map Production	Map Interpretation
What is on the map? What is the theme and the message of the map? What geographical area does the map show? How do you think its "area of interest" was defined? When is the map – what period does it present?	**Who made the map?** Whose logos and names are on the map? Is there a clarification of their approach and position? What might their agenda have been? Who participated in producing or editing the map?	**Who is/are the map's audience(s)?** How might these audiences be most likely to encounter and engage with the map? Would they find the map intelligible and easily navigable?
Layout and Legend: How do the title, captions, text color (so-called "perimap") set the context for reading the map? What's the "base map"? What projection is used? What space is in the centre of the map? How do these features (projection, centre, legend, frame) shape the way we see and understand the map?	**How was the map made?** What technology and visualisation methods were used to produce the map? How does the technology of production shape the ways we see and understand the map?	**How is the map presented?** What are its material and form? What format and media is used to present the map? How does this presentation shape the ways we see and understand the map? How does this form enable or constrain the map in fulfilling its purpose, reaching its desired audiences, etc?
Presentation of data: How is data presented? What do the symbols, colours, background, projection and other features in the map image contribute the map's message? What data is missing on the map?	**Data analysis:** How were the data derived? With what methodology? How were the data analysed? What type of data is shown? How do the classification techniques, choice of scale, research methods, and sources shape the map?	**Interpretation of data:** Is there a legend that explains how data should be interpreted? Is the interpretation of data explained? Is this interpretation presented as objective and neutral?

Methods of map analysis

- Content Analysis (qualitative and quantitative)
- Iconography / Semiology
+ Design Space Analysis

Content Analysis: Analysing school atlases (Leibniz-IfL project)





See more:
https://research.uni-leipzig.de/~sfb1199/app/uploads/2019/04/wp19_moser-et-al_web_190430-2.pdf

CONTENT ANALYSIS (per individual map)

Map Information														
Map Cluster	**Map Title**	**Author & Publisher** (state, think tank, international diplomacy, research, bottom-up)	**Format** (Print, digital, digital-interactive,...)	**Target Group**	**Year**	**Spatial Object** (Maps, Cartograms, Picture, Satellite image, Art object)	**Map Area / base map**	**Timeframe** (present,past, future)	**Theme / Purpose**	**Scale level** (World*, Regional*, National*, Subnational*, Local*)	**Scale Ratio:** Ratio, Other ratio, Scale bar*	**Centering / Frame**	**Projection**	**Framing*:** Isolated Map, Surrounding Map

Map Signs						
Map Cluster	**Map Title**	**Legend**	**Thematic symbol:** Point symbols (Symbol*, Diagram*); Line symbols (Territorial border*, Flowlines - simple* / proportional*, Arrows - simple* / proportional*, Others*); Area symbology (Area-related symbol*, Area-related diagram*, Administrative units – Choropleth map*/Pattern*/Cluster of points*; Non-Administrative units – Choropleth map*/Pattern*/Cluster of points*); Labels (Text*, Graphic*, Picture*, Map*); Graphic element related to the map (Text*, Graphic*, Picture*, Map*, Sketch Map*);	**Conflict Specific Signs** (events, unit positions, movement, etc)	Landscape Signs & Symbols	Territorial / Non-territorial Features

See more:
https://research.uni-leipzig.de/~sfb1199/app/uploads/2019/04/wp19_moser-et-al_web_190430-2.pdf

Iconography / Semiotics

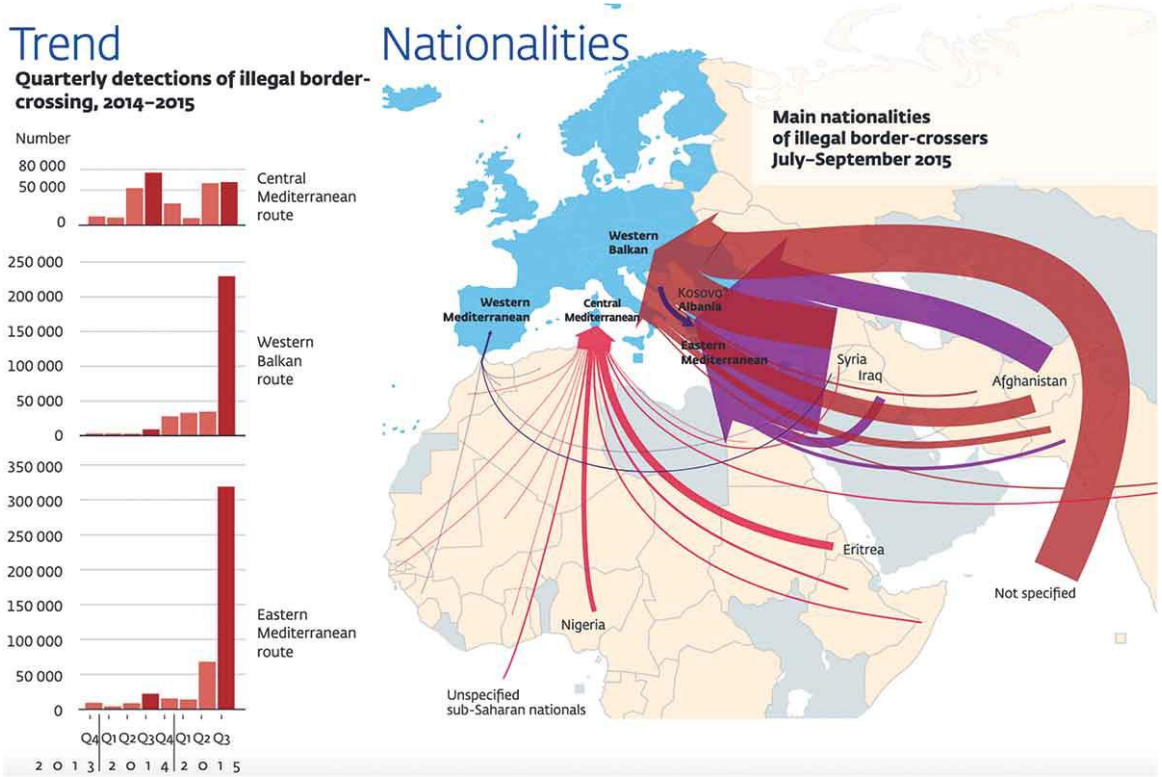
Iconography (Panofsky 1955; Gombrich 1972): Representational meaning, iconographic symbolism, iconological symbolism

Semiotics (Roland Barthes): Denotation (what is depicted) + Connotation (what values and ideas are expressed through what is and how it is represented)



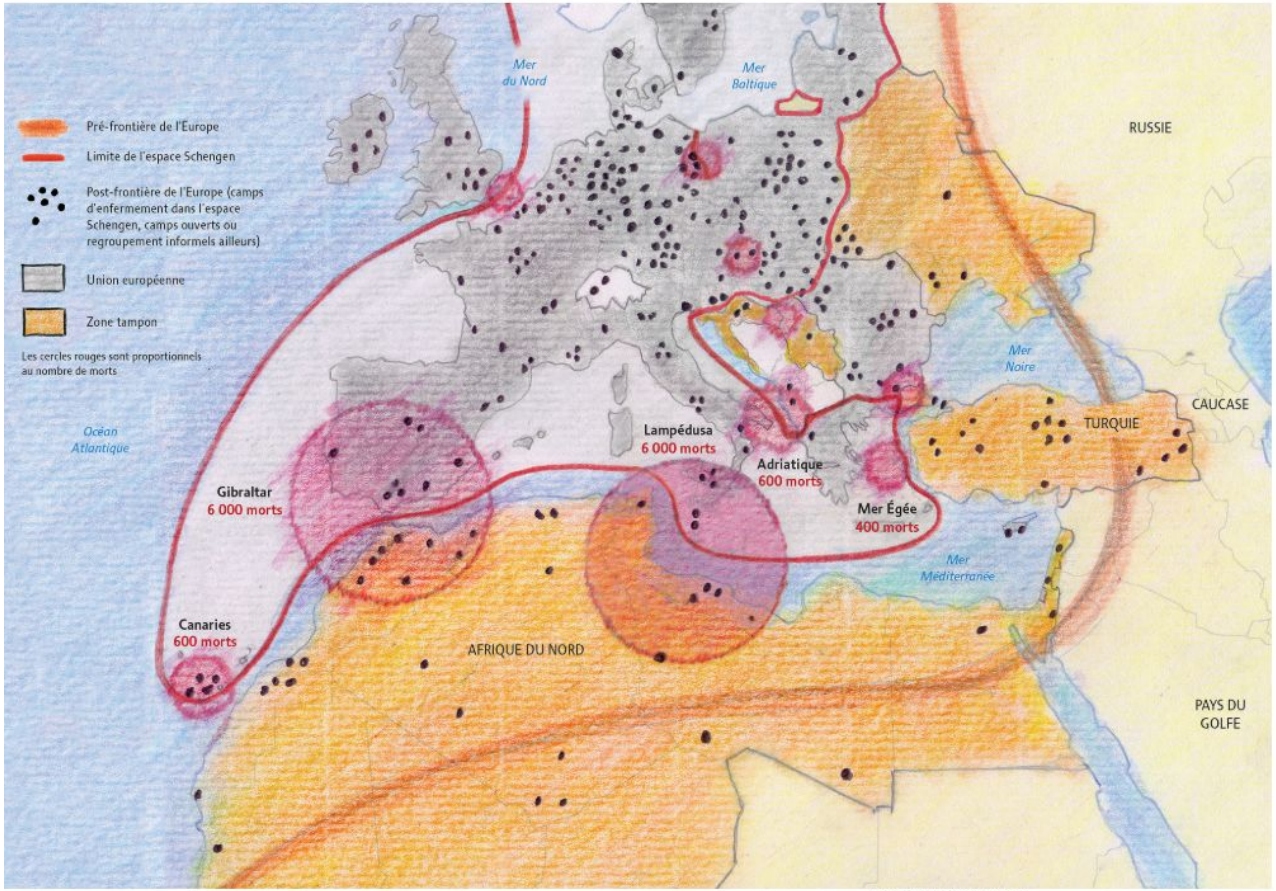
Images: US President Calvin Coolidge. Library of Congress. Public Domain - Wikimedia Commons.

Iconography / Semiology



The Frontex map of 2015. Source: https://tinyurl.com/y6o38jq3 © Frontex, 2015 All rights reserved. Reproduction is authorised provided the source is acknowledged.

Read More about the iconography of arrows: Henk van Houtum & Rodrigo Bueno Lacy (2020) The migration map trap.



Mourir aux portes de l'Europe

Alternative maps
Countercartography

Philippe Rekacewicz: Dying at the Gates of Europe

Source: Screenshot Mourir aux portes de l'Europe - Philippe Rekacewicz - Visionscarto. Philippe Rekacewicz / VisionCarto

Wood and Fels (2008) - Mental Space / Paramap

Connection of mental spaces in cartographic thinking and the 'paramap' - contextual information needed to understand the construction of the map:
Design Space Approach refocuses on the temporal, socio-material and socio-technical relations.







„Flooding with maps" (Branch, 2013)

DESIGN SPACE

temporality
(legacies and future effects)

socio-material relations
(distributed cartographer / maps as aids)

Bringing together and comparing maps from different periods to challenge chronological linearity and to focus on cartographic legacies and future effects.

Trace what enters the design space, and what stays out of it

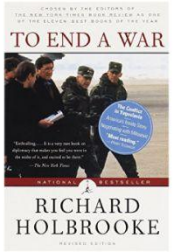
choice of data, design features, actors/relations, technologies, cartographic legacies, map uses and evaluations

The figure of the cartographer is complex and the expertise is distributed - focusing on actors, their relations, socio-technical settings and uses of the map to trace the complex back-end process.

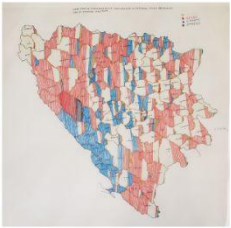




„Map Marathon" (Chollett, 2005)





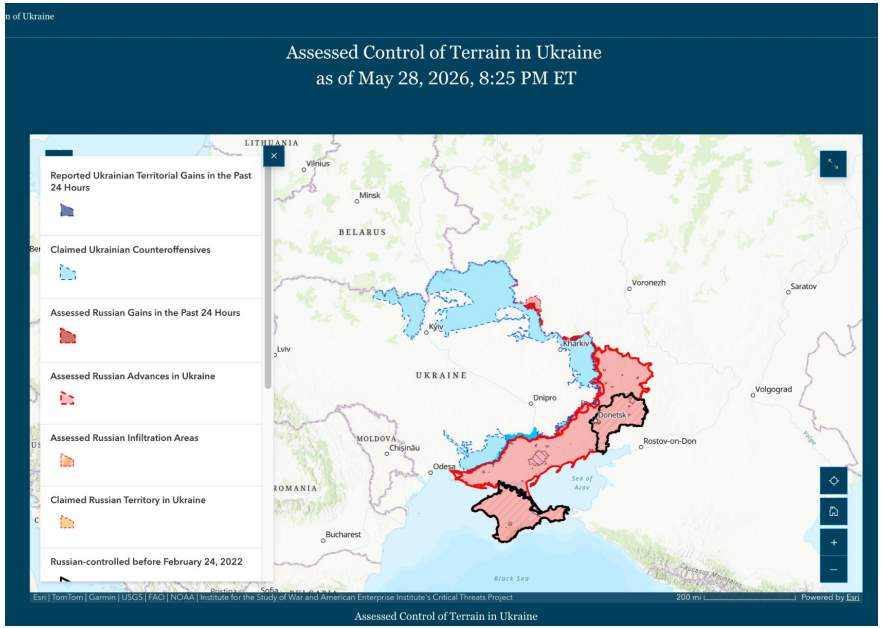


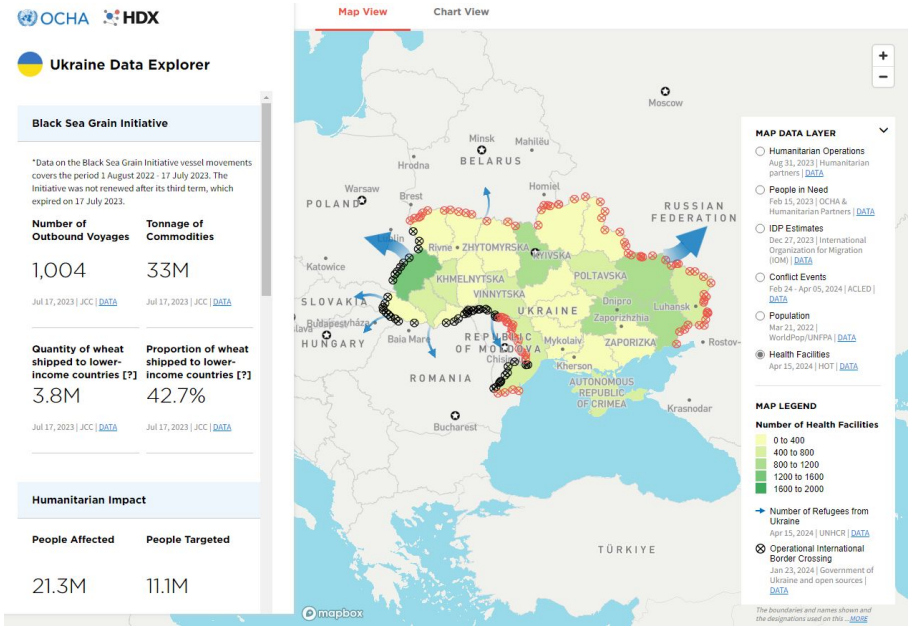
Analysing maps and their historical / socio-material context. See more: Zuljevic. 2025. Design perspective in map analysis
https://www.tandfonline.com/doi/full/10.1080/23729333.2025.2497655

CRITICAL MAP READING GUIDE (Map Itself: Topic, Data Selection and Data Analysis)

- **What are the topics, data and inputs used to make this map or maps (look at the map title, legend, information in the map frame)?** What is their relation – why is a specific set of data selected to represent the topic? How is the topic framed with the map title?
- **How was the data analysed and classified?** (Pay attention to the legend, classification techniques, choice of scale, listed sources of data, use of additional graphics e.g. diagrams, etc). Is the interpretation of data explained (e.g. with a short text on the map)? Can you identify any concerns with how data was collected and analysed (e.g. unreliable sources or classification techniques which might distort the dataset)?
- **What data and information relevant to the topic might be missing from the map?** Why do you think this was left out? Can you identify some perspectives that might be missing in the map that point to a silencing of specific positions, data or narratives? Are missing data or uncertainties acknowledged in some way (e.g. in the map text)?
- **How are different actors or parties in conflict visualised?** What groups, identities or subjects (e.g. ethnicities, aggressors, victims, allies) does the map represent?
- **What is the time of the map?** What period or moment in time does it represent? When was it made? Does it represent the future, present or the past in relation to when it was made? Is it documenting what happened, or does it propose a vision of how something should be? How is the map(s) producing an image of a specific temporal regime (see, for example, daily conflict maps of Ukraine)?

Topic & Subject Matter: Military, civilian, humanitarian or another perspective?



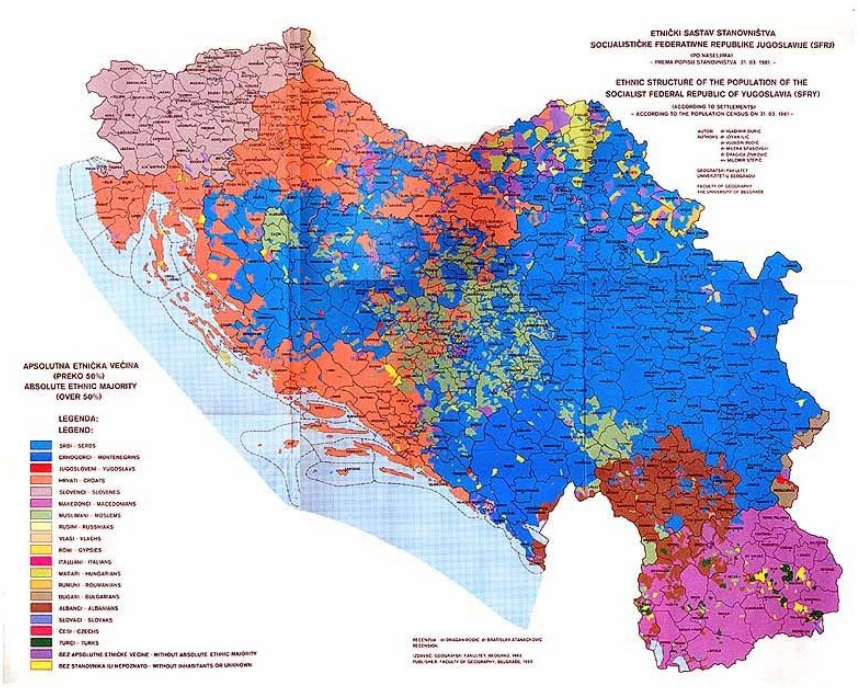


1. Screenshot: ISW Assessed Control of Terrain in Ukraine https://storymaps.arcgis.com/stories/36a7f6a6f5a9448496de641cf64bd375
2. Screenshot: OCHA & HDX Ukraine Data Explorer https://data.humdata.org/visualization/ukraine-humanitarian-operations/

Data & Analysis (Legend, Actors, Absences)

Choropleth / patterns / diagrams to show ethnic distribution: What is the difference?

Colours to represent different ethnicities (actors in conflict): Stereotypical colours, use of red/blue in conflict contexts? Who is missing?



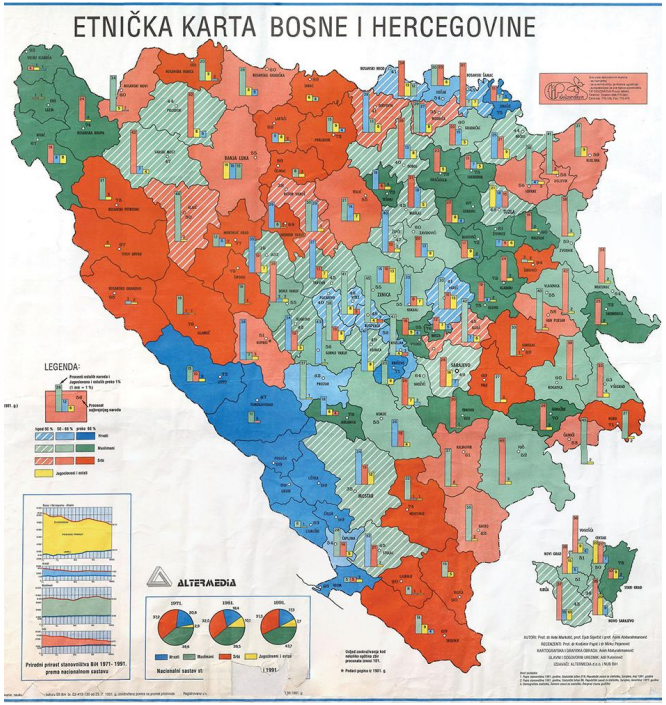
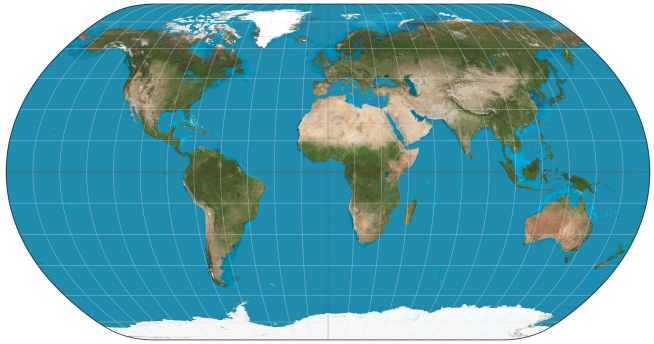


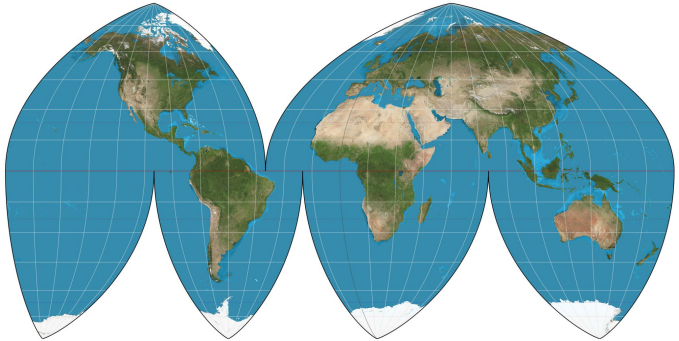
Fig 1. Ethnic map of Yugoslavia 1980 (Wikimedia Commons). Fig 2. Ethnic Map of BiH (Markotic et al. 1991). Bosnjacki Institut Adil Zufikarpasic. Used with Permission.

CRITICAL MAP READING GUIDE (Map Itself: Map Construction and Design Features)

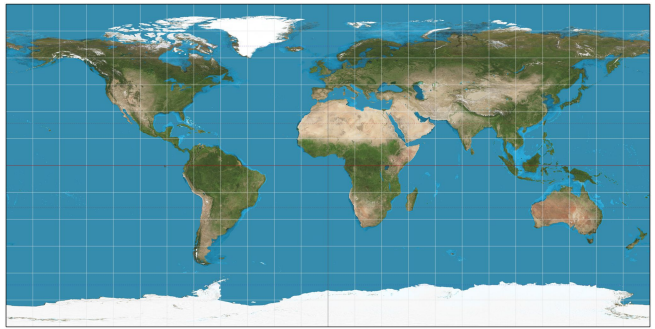
- **What base map and projection are used and why?** How do they shape the understanding of the map? E.g. is the base map a physical, transport or political map? What features does it bring into focus (e.g. terrain, roads or national borders)? Why is that so? Is the projection Mercator (see critique about its colonial view of the world)?
- **How does the visual design of the title, captions, map frame and other elements surrounding the map represent the theme of peace and/or conflict?** E.g. is the choice of fonts suggesting seriousness and trustworthiness? What words are emphasised and which ones are presented as less relevant?
- **What are the specific colours, signs and symbols used to represent the data, and how are they used to visualise peace and conflict?** E.g. what kind of lines are used to represent different borders? Are these symbols used in some ways to manipulate data or to persuade the viewer?
- **What 'atmosphere' does the map convey through colour palettes, imagery or specific visual tones (dynamic, warning, calm, etc)?** What are common visual design choices and styles across maps to depict the themes of peace or conflict?

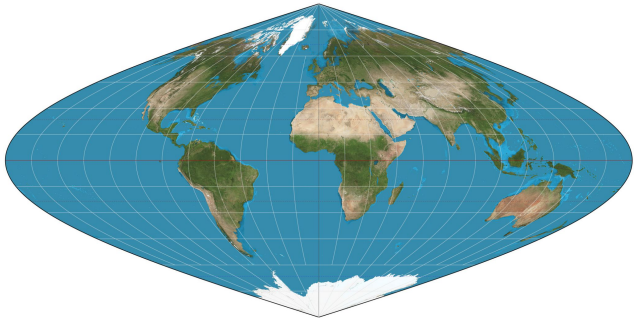
Selection of Projection (Grid)





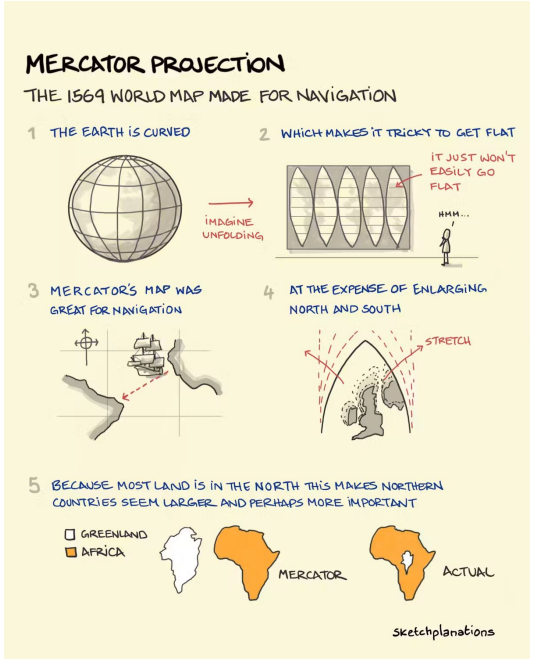


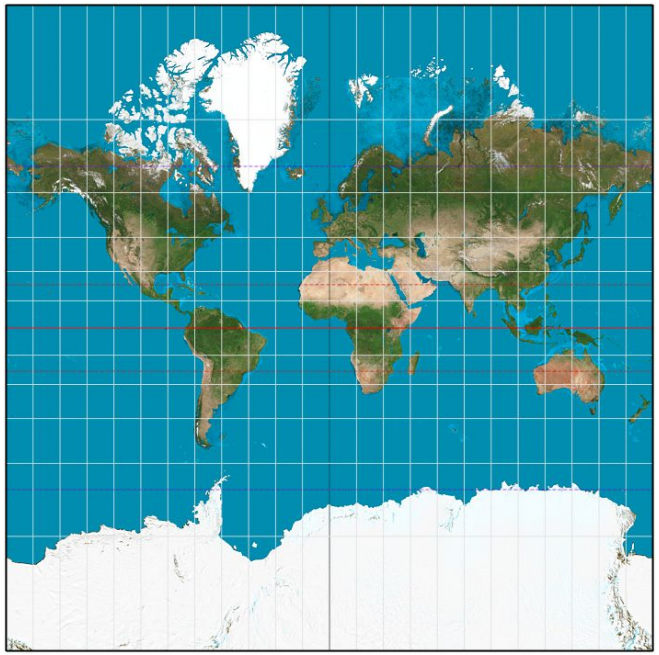


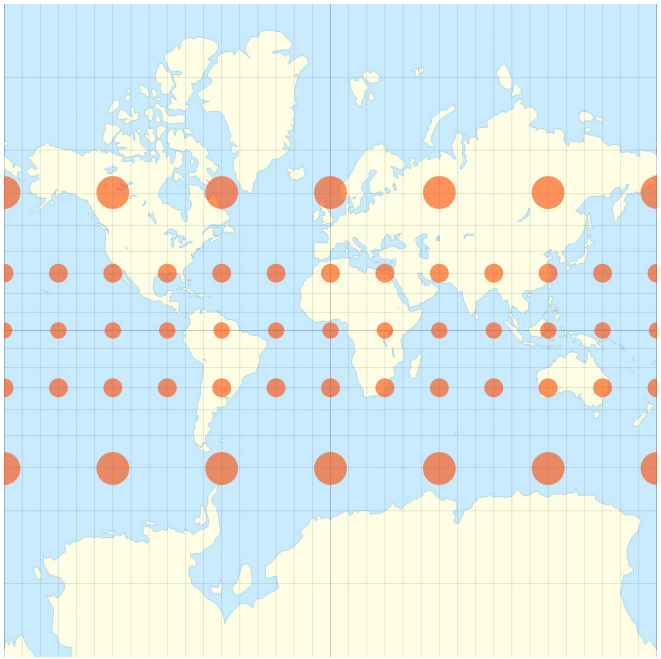


Source: Wikimedia Commons

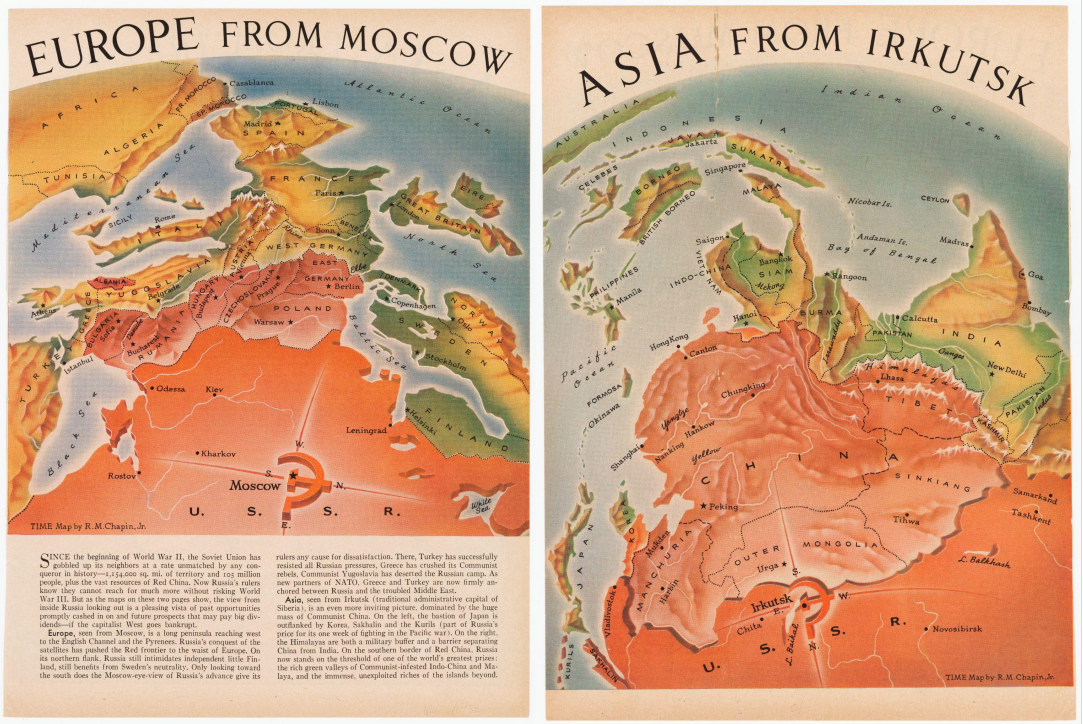
Selection of Projection (Grid): Mercator Projection Distortion





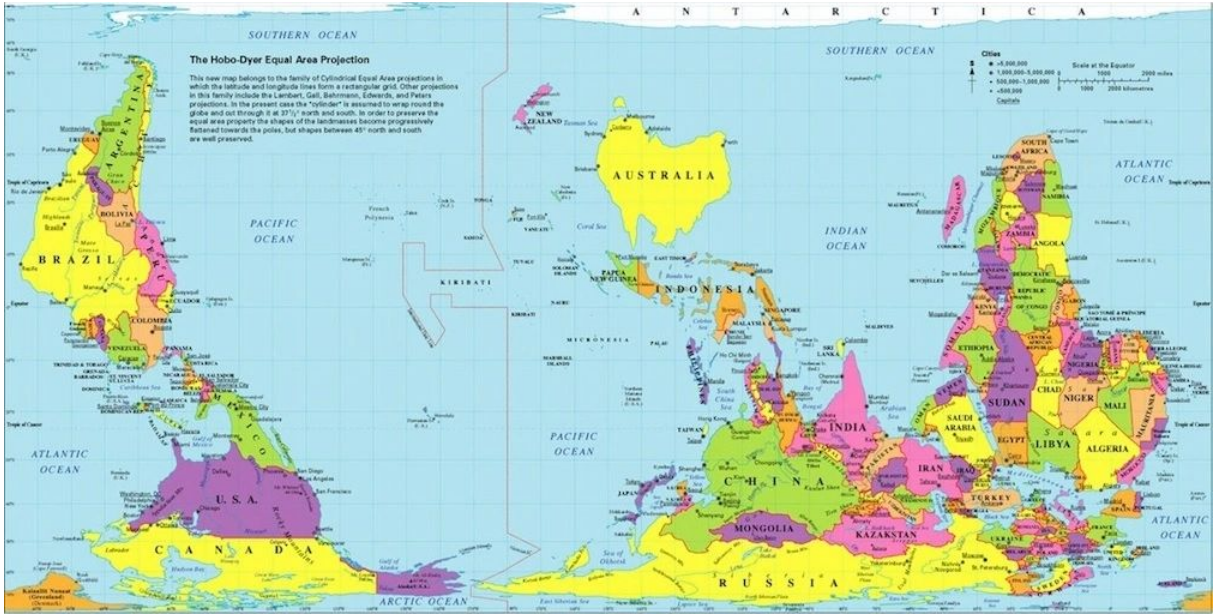


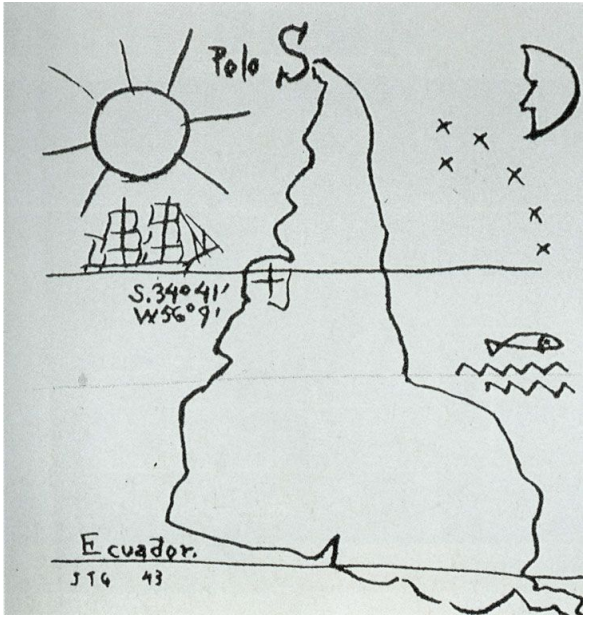
Sources:
Fig 1: Sketchplanations | Jono Hey (CC)
Fig 2-3: Wikimedia Commons



Cold War period maps by Robert M. Chapin. Source: Cornell University – https://digital.library.cornell.edu/catalog/ss:3293938 (Wikimedia Commons - Public Domain).

Challenging Eurocentric Projections / Orientation





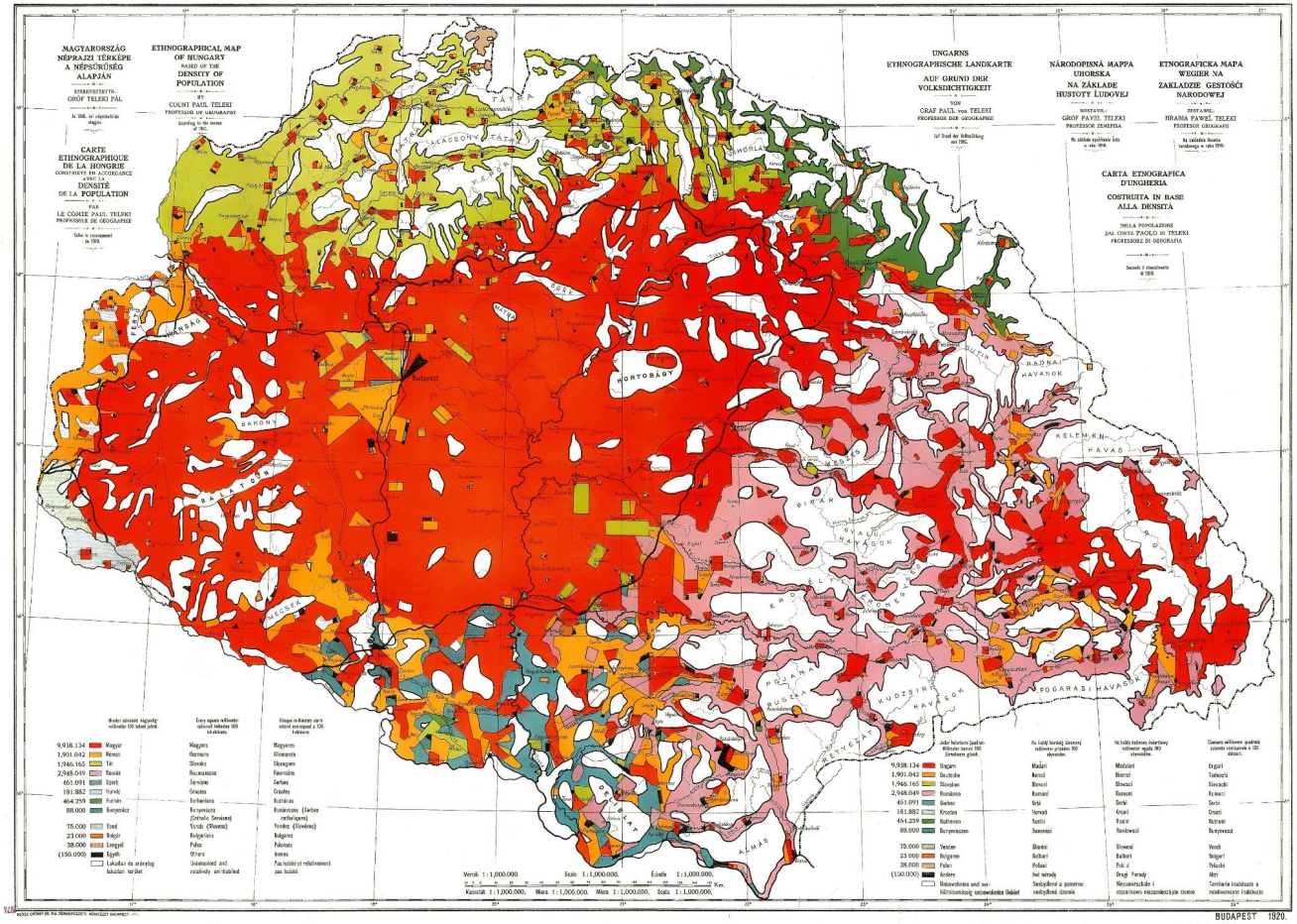
Sources:
Fig 1: Decolonial Atlas / http://www.transpacificproject.com/wp-content/uploads/2011/06/SouthUpMapr.jpg
Fig 2: Joaquín Torres García - América Invertida (Wikimedia Commons)

CRITICAL MAP READING GUIDE (Map Itself: **Visualising territory)**

- **What is the core argument for representing territory in a specific way?**
- **What space/territory is central to the map (centring)?** How is it framed (framing)?
- **What are the forms and instruments of representing different types of territory?** How are borders represented and what are the different features and data used to represent territorial control? Are there any features or spatial formats in the map which represent non-territoriality (e.g. symbols of movement, cross-border landscapes and regions)?
- **How are map symbols (e.g. point, line and area) used to depict territorial and non-territorial formats?** Are specific territorial figures emphasised?
- **What is the language of the labels? Is there political iconography used?** Are the languages of different conflict parties used and in what ways? Are there national, ethnic, heraldic, or other political symbols anywhere on the map?

Territorial claims and figures

Source: Count Teleki. 1910. Ethnographic map of Hungary /Carte Rouge (Wikimedia Commons).

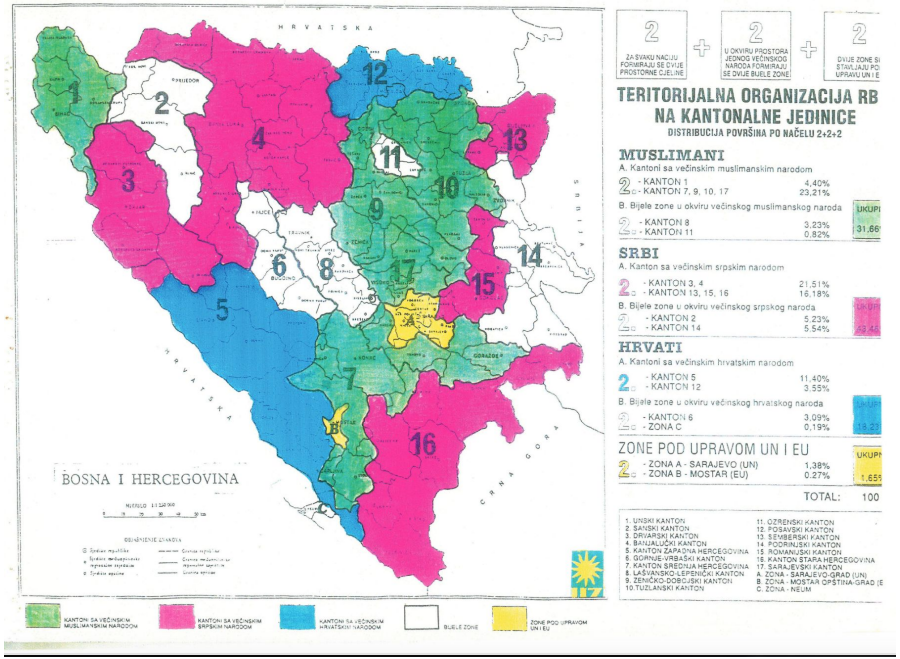


CRITICAL MAP READING GUIDE (Map Itself: **Multiperspectivity)**

- Does the map(s) represent **more than one perspective** and how? What map elements and features are used in a multiperspective way? Is **external** or **complementary** information and media provided to support a multiperspective understanding of the map?
- How are map features used to present multiple perspectives in one map? Are there examples of **several maps** used to achieve multiperspectivity?
- Are some elements, e.g. the **projection** or **centring**, used to enforce a specific perspective on peace and conflict?
- What are the **dominant perspectives** in the map (by whom, for whose benefit)? Are there **counter** or **alternative** perspectives represented? What do **missing data** and **cartographic absences** say about dominant and silenced perspectives?
- Does the map represent **multiple temporal perspectives**?

Multiperspective maps?

Multi-ethnic maps of BiH as proposals for regionalisation or federalisation appropriate the symbology of ethnic maps (choropleth, colours and lines) to intervene in them by introducing multi-ethnic units as areas with shared administration.

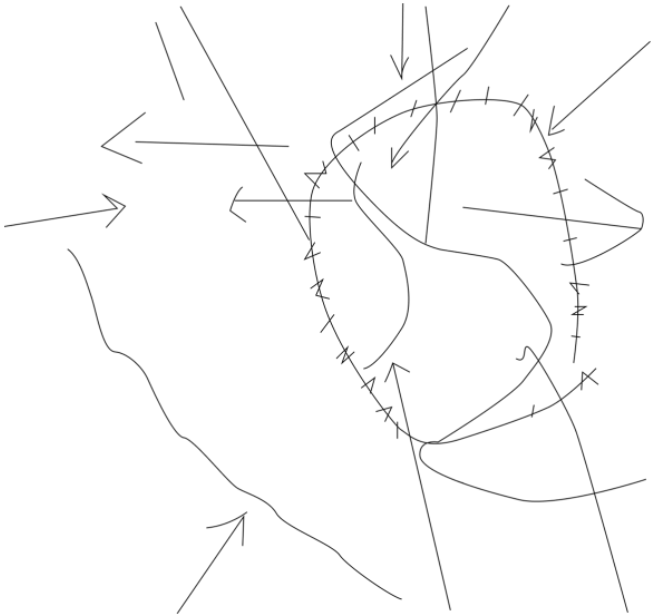


Source:
Ivo Komsic Private Collection (Used with permission)

MAPS IN CONTEXT

Processual Cartography (Edney 1993, Pickles 2004, Kitchin, Perkins & Dodge, 2009)

- Maps within assemblages - Looking at mapping processes and the context of mapping
- Going beyond the maps-as-power understandings which assume universal power to maps, in order to focus on what they accomplish rather than what they show (Pickles, 2004)
- Maps as ”always in a state of becoming; as always mapping; as simultaneously being produced and consumed, authored and read, designed and used” (Kitchin, Perkins and Dodge, 2009)
- Analysing maps in context requires additional research: archival work, literature review, discourse analysis, document analysis, interviews, etc.



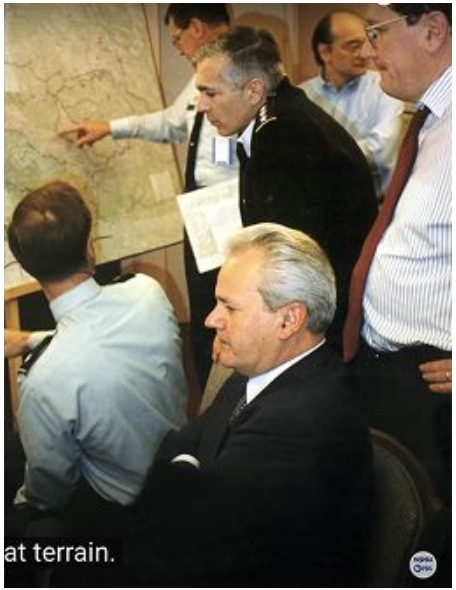


Fig. 1: Illustration based on a map drawn by Croatian wartime president Tuđman in 1995, representing his idea of dividing Bosnia and Herzegovina. Mela Zuljevic.

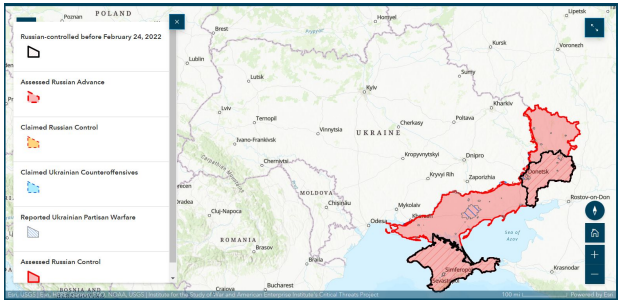
Fig. 2: Screenshot taken from the WPSU's Geospatial Revolution series, Episode 3, on the use of Powerscene technology during the Dayton peace agreement talks. Used with permission.

Processual approach can address the shortcomings existing critical analysis methods, e.g.:

- Authorship is often unclear or distributed
- The processes of map production, use, interpretation are entangled
- Insights into social aspects and materiality are not reached
- How to account for transitory qualities and for how maps influence each other - necessary to analyse several maps together

MAP ANALYSIS EXERCISE: Maps representing Russian invasion of Ukraine 2022 - onwards in the digital context

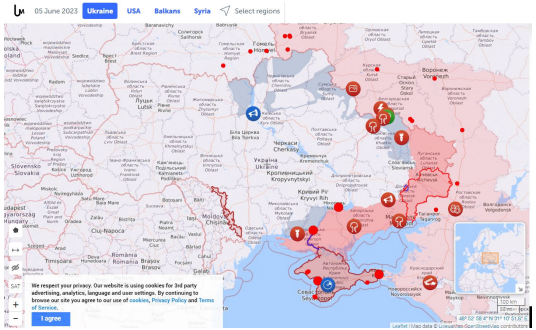
Choose a map (or select another example) and use the Critical Map Reading Guide to analyse it.



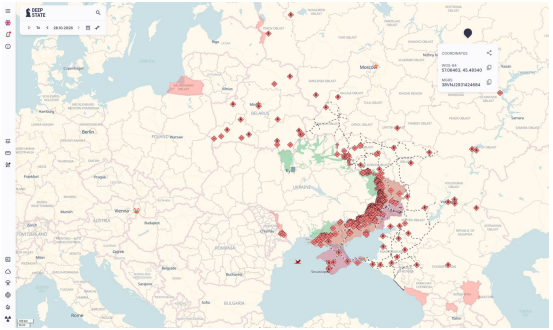
Screenshot ISW Interactive Map: Russia's Invasion of Ukraine (arcgis.com)



Screenshot Russia's invasion of Ukraine in maps — latest updates | Financial Times (ft.com)



Screenshot LiveUA map



Screenshot Deep State Map UA