

GET1001 & GEX1003: Seeing The World Through
Maps

AY25/26, Y3S1

Exam Preparation Notes

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1 Past Year Exam Questions (Argument Flows)

1.1 2019 Exam Question (Topics 3 & 4: Politics and Economics)

Question: “Maps are powerful political instruments used by governments as much as they are effective economic tools deployed by private enterprises for their specific purposes.” To what extent would you agree with this assertion? Make use of concrete examples to support your stand.

Argument Flow:

- **Introduction:**

- Agree with the assertion. Maps are inherently subjective and selective, never neutral mirrors of reality.
- Define the dual nature: Governments use maps for *legitimacy and control*, while enterprises use them for *seduction and profit*.

- **Political Instruments (Governments):**

- **Claiming Territory:** “To map a territory is often to claim it”. Maps act as performative speech acts that bring political entities into existence.
- **Nation Building (The Geo-body):** Reference Thongchai Winichakul’s concept of the *Geo-body*, where mapping created the nation of Siam (Thailand) rather than just reflecting it. Without maps, people cannot “see” or “imagine” the nation.
- **Colonial Control:** The British Great Trigonometrical Survey of India used trigonometry to determine locations, “inscribing imperial power” onto the land.
- **Example:** Sanson’s Map (1656) minimized English territories and maximized French claims in North America to sway European political opinion.

- **Economic Tools (Private Enterprises):**

- **Limited Truth:** Advertisers share with cartographers the need to “communicate a limited version of the truth”.
- **Mechanisms of Distortion:** Use of *simplification* (suppressing unfavorable details) and *amplification* (exaggerating favorable ones).
- **The “Tree Stamp” Technique:** Developers use digital tree stamps to fill empty spaces on planning maps, creating a false impression of a lush, eco-friendly environment to secure investment or approval.
- **The “Dot Map” Strategy:** Flooding a map with dots to imply “numerousness indicates success” and social proof, regardless of service quality.

- Conclusion:

- Both sectors manipulate the “4Ms” (Mapmaker, Message, Medium, Men/Women).
- The power lies in the map’s authority to select what is visible and what is silenced.

1.2 2017/18 Exam Question (Topic 4: Social Construction)

Question: “Amplification and simplification are the most basic means by which cartographers manipulate maps to serve strategic agendas.” Discuss the different ways in which maps may be socially constructed, and consider the advantages and drawbacks of such constructions.

Argument Flow:

- Introduction:

- Define maps as social constructions reflecting the “mental and moral qualities” of the mapmaker.
- Define *Simplification* (omission for clarity/deception) and *Amplification* (exaggeration for emphasis/persuasion).

- The Mechanics of Construction:

- **Subjectivity:** Discuss Wright’s “subjective dimensions” including aesthetics, judgement, and the fear of blank spaces.
- **Projection as Distortion:** Every projection distorts reality. The Mercator projection amplifies the size of the Northern Hemisphere (polar areas), reinforcing Eurocentric dominance.

- Advantages (Utility):

- **Clarity:** Simplification is necessary to avoid graphic interference; a map showing every detail would be overcrowded and useless.
- **Synthesis:** Compounding different info (e.g., rainfall and crops) reveals relationships between elements.

- Drawbacks (Deception & Exclusion):

- **Political Erasure (Silences):** Colonial maps often erased indigenous presence to present land as empty and ready for claiming.
- **Economic Deception:** Real estate maps distort distances to make properties appear closer to transport hubs or beaches.

- Conclusion:

- Social construction is inevitable but requires “cartographic literacy” from users to deconstruct hidden agendas.

1.3 2016/17 Exam Question (History & General Concepts)

Question: Maps have been valued since the days of hunters and gatherers. Consider the different ways in which maps have served practical and powerful purposes across time. In your view, what is the single most important reason for having maps today?

Argument Flow:

- **Historical Purposes:**

- **Indigenous/Pre-modern:** Survival (food sources) and Spiritual connection. Aboriginal “Dreamtime” maps encode secret spiritual stories alongside navigational data.
- **Imperial/Colonial:** Control and extraction. “Local knowledge is being used by an imperial power for the advancement of its own ends”.
- **Modern Nation-State:** Creating a shared national identity and “Geo-body”.

- **The Single Most Important Reason Today:**

- *Argument: Managing Complexity in a Data-Driven World.*
- **Digital Production:** Digital maps do not just reflect the world; they participate in its production.
- **Integration:** Modern life relies on Location Based Services (LBS) which integrate navigation, commerce, and social interaction into a single interface.
- **Example:** “Smart City” management (e.g., Cooling Singapore digital twins) uses maps to manage climate change, traffic, and energy.

- **Conclusion:**

- The medium has shifted from rock to pixels, but the core function remains: organizing complex spatial information to enable human action.

2 Sample Discussion Questions (Argument Flows)

2.1 History: Indigenous Maps

Question: Discuss what you know about maps drawn by ‘Hunting and Gathering’ societies. Explain the value and power of such ‘indigenous maps’.

Argument Flow:

- **Characteristics:**
 - Medium: Ephemeral (sand, wood, skin, dance, song).
 - Dual function: Topographical (wayfinding/food) and Cosmological (spiritual/-beliefs).
 - Example: Australian Aboriginal maps represent “Dreamtime” tracks, linking identity to place.
- **Value and Power:**
 - **Cultural Survival:** Preserving encoded knowledge of resources and history.
 - **Political Reclamation:** Used in modern legal battles (e.g., 1991 Australia High Court ruling) to prove historical occupancy and claim Native Title.
- **Contemporary Relevance:**
 - Modern “Story Maps” attempt to recapture this narrative depth, moving away from purely scientific/objective mapping.

2.2 Digital Maps: Social & Political Bias

Question: Discuss why and how digital maps differ from traditional paper maps regarding social and political biases?

Argument Flow:

- **Difference in Bias Source:**
 - Paper maps had *static* design biases (projection, selection).
 - Digital maps have *interactive* and *algorithmic* biases. They appear neutral due to real-time precision but rely on user interaction and live feeds.
- **New Forms of Bias:**
 - **The Digital Divide:** “Map deserts” occur in areas with low commercial value or limited connectivity, rendering populations invisible to services.
 - **Culture Bias:** Maps are not neutral; they encode cultural assumptions and often erase local identities.
 - **Algorithmic Invisibility:** Small businesses without advertising budgets may not appear on search layers, unlike “Dot Map” strategies of large chains.

2.3 Digital Maps: Location Based Services (LBS)

Question: Discuss the advantage and disadvantage of using LBS in everyday digital life.

Argument Flow:

- **Introduction:** LBS makes maps ubiquitous, providing information depending on the user's location.
- **Advantages:**
 - Efficiency (real-time navigation), Safety (emergency response), and Personalization.
- **Disadvantages (The Geoprivacy Paradox):**
 - Users trade sensitive locational data for convenience.
 - **Surveillance:** “Surveillance Capitalism” where movement patterns are monetized.
 - **Security Risks:** The Strava Heatmap incident revealed secret US military bases by aggregating fitness tracker data of soldiers.

2.4 Crowdsourcing: Volunteered Geographic Information (VGI)

Question: Discuss the advantages and limitations of crowdsourced and socially sensed data.

Argument Flow:

- **Introduction:** Shift from “authoritative” mapping (governments) to “asserted” mapping (citizens) known as VGI.
- **Advantages:**
 - **Speed:** Rapid response during disasters (e.g., Humanitarian OpenStreetMap Team during Haiti/Nepal earthquakes).
 - **Granularity:** Locals map informal settlements that official maps ignore.
- **Limitations/Challenges:**
 - **Credibility:** Risk of vandalism or inaccuracy (“Epistemic power” - whose knowledge is credible?).
 - **Demographic Bias:** Contributors are often skewed in terms of demographics (gender/region), leading to representation bias.
 - **Ethics:** Privacy concerns when mapping vulnerable communities without their informed consent.

2.5 Environment: Climate Change & Digital Maps

Question: Discuss how digital maps contribute to climate change monitoring, adaptation, and mitigation.

Argument Flow:

- **Contribution:**
 - **Monitoring (One Earth):** Satellite imagery tracks deforestation and land use change.
 - **Adaptation:** Digital Twins (e.g., Cooling Singapore 2.0) simulate urban heat islands to plan better cities.
 - **Mitigation:** Tracking carbon footprints and planning renewable energy sites.
- **Challenges (The Paradox):**
 - **Carbon Footprint:** The data centers and AI models required to process these maps consume massive amounts of energy (ChatGPT uses 10x more energy than a Google search).
 - **Data Justice:** Unequal access to high-resolution climate data across regions.

3 8 New Related Questions (With Argument Flows)

3.1 Q1: The “Human” Element in Cartography

Question: Wright (1942) asserted that “Map makers are human.” Evaluate how the subjective nature of the mapmaker influences the final map product, distinguishing between “scientific integrity” and “judgment.”

Argument Flow:

- **Introduction:** Maps are not objective realities but reflections of the mapmaker’s “mental and moral qualities”.
- **Scientific Integrity:**
 - This involves a commitment to accuracy but also the acknowledgement of ignorance.
 - Mapmakers must decide how to represent uncertain data (e.g., using broken lines for approximate contours or symbols for “position doubtful”).
- **Judgment and Aesthetics:**
 - Mapmakers use judgment to select source materials and colors.

- Aesthetics can override accuracy; a “beautiful” map inspires confidence even if it is factually flawed.
- The harmony of color and shading is a subjective artistic choice, not a scientific one.
- **Conclusion:** The distinction is blurry; what looks like scientific simplification often involves subjective amplification to make the map readable or persuasive.

3.2 Q2: The Shift from Authoritative to Asserted Mapping

Question: “The democratization of map-making implies that everyone can be a map-maker.” Critically assess the impact of Citizen Science and Volunteered Geographic Information (VGI) on the authority of traditional cartography.

Argument Flow:

- **Introduction:** Traditional mapping was the domain of experts and governments. The digital era introduced VGI, coined by Goodchild (2007), turning citizens into sensors.
- **The Impact on Authority:**
 - *Shift in Power:* Authority moves from centralized agencies (e.g., USGS) to the “crowd” (e.g., OpenStreetMap, Wikipedia).
 - *Speed vs. Accuracy:* Citizen science offers real-time updates (social sensing) which traditional agencies cannot match, especially in disasters.
- **The Risks:**
 - *Credibility:* “Epistemic power” struggles arise—whose knowledge is considered credible?.
 - *Bias:* Unequal participation (rich vs. poor regions) creates new “map deserts” despite the democratization.
- **Conclusion:** While VGI democratizes access, it challenges the concept of a single “authoritative” truth, replacing it with a dynamic, collective, but potentially messy consensus.

3.3 Q3: Urban Planning as Control: The Jackson Plan

Question: “To zone space is to control people.” Using the 1822 Jackson Plan of Singapore as a case study, discuss how colonial powers used mapping to impose order and social control.

Argument Flow:

- **Introduction:** Maps are not just for navigation; they are tools for administration and control. The Jackson Plan (1822) was formed by Raffles to ensure “orderly urban development”.
- **The Mechanism of Control:**
 - *The Grid:* The plan utilized a grid system to compartmentalize the city, replacing haphazard development.
 - *Segregation:* It zoned specific areas for different ethnic groups (European Town, Chinese Campong, Arab Campong), effectively controlling the population by spatial segregation.
- **The Unspoken Agenda:**
 - The map creates a “spatial reality” that serves the colonial administration’s need for taxation, security, and racial management.
- **Conclusion:** The Jackson Plan illustrates that urban planning maps are political documents that enforce social hierarchies and colonial power structures.

3.4 Q4: The Paradox of LBS and Privacy

Question: Location Based Services (LBS) have become ubiquitous in daily life. Analyze the “Paradox of Geoprivacy” and the implications of trading personal data for digital convenience.

Argument Flow:

- **Introduction:** LBS provides services based on user location (e.g., Grab, Google Maps). The “Paradox” lies in the user’s willingness to share sensitive data for minor conveniences.
- **The Data Trade:**
 - Users provide real-time location data to get navigation or recommendations.
 - However, location data is inherently sensitive and difficult to anonymize. A MIT study showed 4 spatio-temporal points can identify 95% of people.
- **Implications:**
 - *Surveillance:* Data is used for corporate profiling (Your Interest, Your Wallet).
 - *Security:* Aggregated data can reveal secure locations (e.g., Strava revealing military bases).
- **Conclusion:** The convenience of LBS comes at the cost of privacy, often without the user fully understanding the extent of the surveillance.

3.5 Q5: The “One Earth” Concept and Digital Mapping

Question: How has the “One Earth” concept influenced the development of digital mapping tools, and what role do these tools play in global environmental governance?

Argument Flow:

- **Introduction:** The “One Earth” concept originates from “Spaceship Earth” and the Earthrise photo (1968), emphasizing a single, interconnected planet.
- **Influence on Tools:**
 - It drove the development of Earth Observation (EO) and platforms like Google Earth Engine to monitor planetary health.
 - It necessitated global-scale monitoring of deforestation, water resources, and air quality.
- **Role in Governance:**
 - *Transparency:* Platforms like Climate TRACE allow for independent verification of emissions, supporting agreements like the Paris Agreement.
 - *Interconnectedness:* Digital maps visualize how local actions (e.g., deforestation in SEA) have global impacts (e.g., climate change).
- **Conclusion:** Digital maps act as a “Global Lens,” translating the abstract “One Earth” philosophy into actionable data for sustainability.

3.6 Q6: The Power of “Silences” in Mapping

Question: Brian Harley (1992) argued for the importance of “silences of the map.” Discuss how the omission of data in digital story maps can be as powerful as what is displayed.

Argument Flow:

- **Introduction:** Story maps combine narrative with geography. However, mapping is an exercise in power, deciding whose story is told.
- **The Power of Omission:**
 - “What is left out is as important as what is shown”. Missing information is itself a form of information.
 - *Example:* A map of a city that omits informal settlements or “slums” effectively erases those populations from planning and resource allocation.
- **Consequences:**
 - This leads to “map deserts” where marginalized communities are invisible.

- Conversely, mapping vulnerable communities without care can expose them to harm (e.g., mapping resources in conflict zones).
- **Conclusion:** Mapmakers have an ethical responsibility to consider these silences and map *with* communities, not just *for* or *of* them.

3.7 Q7: The Shift from Reflection to Production

Question: Kitchin (2008) stated, “Digital maps do not just reflect the world, they participate in its production.” Explain this statement with reference to the evolution from paper to platform mapping.

Argument Flow:

- **Introduction:** Traditional paper maps were static representations of the world. Digital maps are dynamic and integrated into services.
- **Reflecting vs. Producing:**
 - Paper maps *reflected* a snapshot of reality at a specific time.
 - Digital maps (Platforms like Grab/Google) *produce* reality by directing traffic, determining gig economy work zones, and shaping real estate values through “searchability”.
- **The Mechanism:**
 - Algorithms determine the most “efficient” route, physically altering traffic flows.
 - LBS creates a feedback loop where digital data influences physical behavior (e.g., Pokémon GO moving people to specific locations).
- **Conclusion:** The map is no longer a passive tool but an active agent in shaping the socio-economic landscape of the modern world.

3.8 Q8: Epistemological Clash: Indigenous vs. State Maps

Question: Compare the epistemological foundations of indigenous mapping (e.g., Aboriginal Australia) with state-sponsored colonial mapping. How do these different “ways of knowing” conflict?

Argument Flow:

- **Introduction:** Epistemology asks “how we know what we know”. Indigenous and Colonial maps rely on fundamentally different knowledge bases.
- **Indigenous Epistemology:**
 - *Basis:* Spiritual connection, “Dreamtime” stories, and survival.

- *Form*: Ephemeral (sand, body), relational, and not necessarily adhering to Western scale or orientation.
- **Colonial/State Epistemology:**
 - *Basis*: Mathematical accuracy (trigonometry), control, and ownership.
 - *Form*: Permanent (paper), standardized grid, claiming “objectivity”.
- **The Conflict:**
 - Colonial maps viewed unmapped indigenous land as “Terra Nullius” (empty land) because it didn’t fit their visual standard of ownership.
 - Indigenous maps are now being used to challenge this, asserting “native titles” and proving historical occupancy in ways state maps ignored.
- **Conclusion:** The clash is not just about lines on a paper, but about the validity of different cultural existences and definitions of “territory”.

4 Map Evaluation Templates & Argument Flows

This section provides generic, adaptable argument templates for evaluating any map encountered in an exam. These arguments are grounded in course readings and concepts, allowing for critical analysis regardless of the specific map type (paper, digital, historical, or thematic).

4.1 What is Good About This Map? (Strengths, Utility & Power)

4.1.1 Argument 1: Effective Communication through Strategic Design

This argument focuses on the map’s ability to transmit information clearly by removing clutter.

- **Mastery of Simplification:** The map demonstrates effective *simplification*. As Mark Monmonier posits, cartography shares with advertising a “need to communicate a limited version of the truth” (Monmonier, 1996). By consciously suppressing extraneous details (e.g., minor topographical features or secondary roads), this map prioritises the viewer’s cognitive load, ensuring the primary message is not lost in graphic interference.
- **Usage of Visual Variables:** The map successfully employs Jacques Bertin’s “visual variables” (such as size, colour, and texture) to establish a clear visual hierarchy. This allows the user to intuitively grasp the difference between qualitative zones (e.g., land use) or quantitative intensities (e.g., population density) without needing to decode complex data manually.

4.1.2 Argument 2: The Construction of Identity and Reality

This argument focuses on the map's power to create a sense of place or national identity.

- **Creation of the Geo-body:** The map does not merely reflect the territory; it actively produces it. Drawing on Thongchai Winichakul's concept of the "geo-body," this map gives a concrete shape to an abstract concept (such as a nation or a community), thereby fostering a sense of belonging. As Winichakul notes, maps "actively structured Siam in our minds as well as on earth" (Winichakul, 2011); similarly, this map constructs a unified identity for the region depicted.
- **Performative Power:** The map acts as a claim to existence. By defining boundaries and naming locations, it serves as a "performative speech act," validating the existence of the entities within it. This is particularly powerful in indigenous or community mapping, where the act of mapping acts as proof of historical occupancy and cultural survival.

4.1.3 Argument 3: Narrative and Emotional Engagement

This argument focuses on the map's ability to tell a story rather than just show locations.

- **Narrative Potential:** This map transcends the traditional role of a locational reference to become a "Story Map." By weaving together spatial data with narrative elements (text, images, or historical context), it taps into the "narrative potential of map and mapping" (Caquard, 2014). This approach humanises the data, transforming abstract space into "lived place."
- **Visualising the Invisible:** The map succeeds in making invisible phenomena (such as climate change, historical events, or social flows) visible. By translating non-visual data into spatial terms, it serves as a "Global Lens" (Lecture Topic 11) that allows users to comprehend complex, large-scale issues that would otherwise be abstract and ungraspable.

4.2 What is Bad About This Map? (Critique, Bias & Limitations)

4.2.1 Argument 1: Subjectivity and Hidden Agendas

This argument critiques the mapmaker's bias and the illusion of objectivity.

- **The Illusion of Objectivity:** While the map presents itself as a scientific document, it is fundamentally a reflection of the mapmaker's bias. As J.K. Wright famously asserted, "map makers are human," and every map reflects their "mental and moral qualities" (Wright, 1942). This map hides its subjective choices (selection, colour, projection) behind a veneer of authoritative design, leading the viewer to accept a constructed worldview as absolute fact.

- **Deceptive Amplification:** The map employs *amplification* to distort reality for persuasion. Whether for economic gain (e.g., a developer making a condo appear closer to amenities) or political power (e.g., a state exaggerating its territory), the map exaggerates favourable details while suppressing unfavourable ones, serving a specific strategic agenda rather than geographic truth.

4.2.2 Argument 2: Exclusion and the Politics of Silence

This argument critiques what the map leaves out.

- **The Power of Silences:** The map is defined as much by what is absent as what is present. Relying on Brian Harley's concept of "silences of the map," we must critique the omission of specific features—such as informal settlements, indigenous names, or minority histories. These silences are not accidental; they actively erase unwanted populations or narratives from the spatial consciousness.
- **The Digital Divide (Map Deserts):** If digital, the map reflects socio-economic inequalities. It creates "map deserts" in areas that lack commercial value or digital connectivity. This representational bias ensures that the map serves the interests of the connected elite while rendering the marginalized invisible, reinforcing existing power structures.

4.2.3 Argument 3: Surveillance and the Loss of Privacy

This argument is specific to digital/LBS maps and critiques the cost of convenience.

- **The Paradox of Geoprivacy:** This map participates in the "paradox of geoprivacy," where users trade sensitive locational data for service convenience. The aggregation of this data facilitates "surveillance capitalism," where personal movement patterns are monetised or monitored without explicit, informed consent.
- **Algorithmic Control:** The map does not just reflect the world; it "participates in its production" (Kitchin, 2008). By directing users through specific routes or highlighting paid search results, the map's algorithms actively shape human behaviour and urban flows, prioritising commercial efficiency over social well-being or individual agency.

4.3 What are Ways to Improve About This Map? (Suggestions & Future Directions)

4.3.1 Suggestion 1: Methodological Shifts (Process)

- **From Mapping 'Of' to Mapping 'With':** The production process should shift from a top-down authoritative approach to a participatory one. Embracing the ethos of "mapping *with* communities" rather than just mapping *of* them ensures that local

knowledge and values are integrated. This aligns with the concept of “citizens as sensors” (Goodchild, 2007), validating local expertise.

- **Adopting Ethical Frameworks:** The mapmaker should explicitly adopt ethical data governance frameworks such as the CARE principles (Collective Benefit, Authority to Control, Responsibility, Ethics). This ensures that the map respects the sovereignty and privacy of the subjects depicted, moving beyond simple legal compliance to ethical responsibility.

4.3.2 Suggestion 2: Representational Depth (Content)

- **Incorporating Qualitative Layers:** To counter the reductionism of standard cartography, the map should include “deep mapping” elements. Adding qualitative layers—such as oral histories, soundscapes, or emotional geographies—would provide a thicker, more nuanced description of the territory, bridging the gap between scientific measurement and human experience.
- **Contextual Transparency:** The map should strive for “epistemological transparency.” It should clearly cite its data sources, acknowledge its limitations (e.g., “position doubtful” markers), and perhaps even visualise the uncertainty of the data. This invites the user to read the map critically rather than passively accepting it as truth.

4.3.3 Suggestion 3: Technical and Environmental Sustainability (Infrastructure)

- **Green AI and Sustainability:** If the map relies on heavy computational power (e.g., AI-driven image recognition or real-time processing), its development must prioritise “Green AI” principles. This involves optimizing algorithms for energy efficiency to mitigate the “environmental impacts of digital maps” (Lecture Topic 11), ensuring that the tool used to monitor the planet does not inadvertently harm it.
- **Bridging the Digital Divide:** Efforts must be made to ensure the map is accessible in low-bandwidth environments or ”map deserts.” This could involve offline capabilities or community-led data collection drives (like Mapathons) to ensure that representation is equitable and not solely dependent on commercial infrastructure.