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The UCSB Guide to the Geographic Approach

Title

The UCSB Guide to the Geographic Approach GIS Ethical Case Study Examples

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GIS Ethics Case Study Ideas

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Introduction

This document provides 30 examples of ethics issues that could be developed into ethics lessons and ethics case studies for use in GIScience education. Each scenario includes a short description of the situation, which could be expanded into a full lesson or case. Each scenario also identifies the criteria of the Ethical Reasoning VALUE Rubric that the case highlights and the obligations of the GISCI Code of Ethics that are brought into conflict. Finally, a short description of a tension that exists in the scenario is presented.

If used in the development of educational content, these materials should be expanded and assessed. Depending on how the lesson and/or case study is further developed, numerous ethical issues may arise that can be coded to the GISCI Code of Ethics. For case studies, the **Case Study Template** can be used to structure the development.

Ethical Reasoning VALUE Rubric

The AAC&U identifies five criteria to structure the development of learning materials related to ethical reasoning. Those criteria, and the frequency at which they appear in the examples, are:

- **Ethical Issue Recognition** (24 scenarios)
 - Identifying complex, multilayered ethical problems and cross-relationships
- **Application of Ethical Perspectives/Concepts** (15 scenarios)
 - Applying professional codes and ethical frameworks to specific situations
- **Evaluation of Different Ethical Perspectives/Concepts** (14 scenarios)
 - Weighing competing ethical arguments and defending positions
- **Understanding Different Ethical Perspectives/Concepts** (5 scenarios)
 - Needed when conflicts involve fundamentally different ethical frameworks
- **Ethical Self-Awareness** (4 scenarios)
 - Required when personal values and core beliefs are central to the dilemma

GISCI Code of Ethics

GISCI identifies four levels of obligation that GIS learners and professionals should consider in their practice. The most common conflict among those obligations in the examples are:

- **Obligations to Society vs. II. Obligations to Employers and Funders** (15 scenarios)
 - Classic tension between public good and employer demands
 - Often involves pressure to falsify or minimize important findings
- **Obligations to Society vs. IV. Obligations to Individuals in Society** (7 scenarios)
 - Collective benefits vs. individual rights
 - Privacy, equity, and community displacement issues
- **Obligations to Individuals in Society vs. II. Obligations to Employers and Funders** (6 scenarios)

- Individual privacy/rights vs. commercial interests
 - Data misuse and consent violations
- **Obligations to Colleagues and the Profession vs. Obligations to Employers and Funders (2 scenarios)**
 - Professional integrity vs. business pressures
 - Intellectual property and ethical standards

Scenario 1: Emergency Response Data Sharing

A GIS analyst at a county emergency management office you receive a request from U.S. federal homeland security officials for detailed maps showing the locations of critical infrastructure, including water treatment plants, power substations, and communication towers. The request comes during a national security alert, but your supervisor is unavailable, and the data sharing agreement with infrastructure owners prohibits sharing without explicit consent. How should you respond to this urgent federal request?

Ethical Reasoning Criteria:

1. **Ethical Issue Recognition** - Recognizing competing ethical obligations in a time-sensitive emergency context with legal constraints
2. **Application of Ethical Perspectives/Concepts** - Applying professional codes and legal frameworks to balance public safety against contractual obligations

Primary Conflict:

I. Obligations to Society **vs.** II. Obligations to Employers and Funders

The Ethical Tension:

Your obligation to society demands protecting public safety during a national security emergency, potentially requiring immediate data sharing to prevent harm. However, your employer (the county) has contractual obligations to infrastructure owners who explicitly prohibited sharing without consent. You must choose between potential public safety needs and honoring existing legal agreements that protect critical infrastructure security.

This conflict is particularly challenging because it involves **time-sensitive decision-making without proper authorization** - a situation where following normal approval processes could delay critical emergency response, but acting independently could violate legal agreements and compromise long-term security relationships with infrastructure partners.

Scenario 2: Corporate Surveillance Mapping

Your company has been contracted by a large retailer to analyze customer movement patterns using anonymized mobile phone location data in shopping centers. During analysis, you discover the data isn't truly anonymous—you can identify individual shopping habits, including visits to sensitive locations like medical clinics and religious facilities. The client wants detailed demographic profiles. Do you proceed with the analysis as requested?

Ethical Reasoning Criteria:

1. **Ethical Issue Recognition** - Recognizing privacy violations and consent issues in supposedly anonymous data
2. **Evaluation of Different Ethical Perspectives/Concepts** - Weighing competing claims between contractual obligations and individual privacy rights

Primary Conflict:

II. Obligations to Employers and Funders vs. IV. Obligations to Individuals in Society

The Ethical Tension:

Your employer expects you to complete the contracted demographic analysis and deliver promised services to maintain professional relationships. However, doing so would violate individuals' reasonable expectation of privacy by using personal data beyond its intended purpose and potentially enabling targeting based on sensitive personal activities that individuals never consented to share.

This conflict is particularly challenging because it involves **re-identification of supposedly anonymous data** - a growing concern in the age of big data analytics where combining datasets can reveal personal information that individuals never intended to share.

Scenario 3: Gentrification Impact Analysis

A city planning department asks you to create maps showing property values, demographic changes, and development patterns for an affordable housing study. You realize your analysis clearly shows how certain neighborhoods are being rapidly gentrified, potentially displacing low-income residents. The mayor's office hints they want maps that support their development agenda rather than highlight displacement concerns. How do you handle this conflict between analytical integrity and political pressure?

Ethical Reasoning Criteria:

- **Ethical Self-Awareness** - Understanding your core beliefs about scientific objectivity and social responsibility
- **Application of Ethical Perspectives/Concepts** - Applying principles of analytical integrity versus political accommodation in public policy contexts

Primary Conflict:

I. Obligations to Society vs. II. Obligations to Employers and Funders

The Ethical Tension:

Society benefits from objective analysis that reveals the true impacts of gentrification on vulnerable communities, enabling informed policy decisions. However, your employer (the city) pressures you to present findings that support predetermined political agendas rather than analytical truth. You must choose between providing accurate information that serves the public good and maintaining employment by satisfying political expectations.

This conflict is particularly challenging because it involves **pressure to manipulate scientific analysis for political purposes** - a situation where maintaining analytical objectivity could threaten your career, while compromising scientific integrity undermines the very purpose of evidence-based policymaking that communities depend on.

Scenario 4: Indigenous Land Rights Documentation

An environmental consulting firm asks you to map traditional land use patterns for an indigenous community involved in a legal dispute with a mining company. The community has shared sensitive cultural and ceremonial site locations with you in confidence. The mining company's lawyers have subpoenaed all project data, including your GIS files. What are your obligations to protect indigenous intellectual property and sacred site information?

Ethical Reasoning Criteria:

- **Understanding Different Ethical Perspectives/Concepts** - Analyzing conflicts between Western legal frameworks and indigenous rights perspectives
- **Evaluation of Different Ethical Perspectives/Concepts** - Defending positions on cultural sovereignty versus legal compliance requirements

Primary Conflict:

IV. Obligations to Individuals in Society vs. II. Obligations to Employers and Funders

The Ethical Tension:

You have moral obligations to respect the indigenous community's cultural privacy and protect sacred site information shared in confidence, especially given historical exploitation of indigenous knowledge. However, legal compliance with subpoenas and maintaining professional relationships with your employer require full disclosure of project data. You must balance respect for indigenous rights against legal and professional obligations.

This conflict is particularly challenging because it involves **competing legal and moral frameworks** - where Western legal systems may not recognize indigenous intellectual property rights or the sacred nature of cultural sites, forcing you to choose between legal compliance and respecting indigenous sovereignty over traditional knowledge.

Scenario 5: Flood Risk Disclosure Dilemma

A suggested revision: Your flood risk analysis for a city planning department reveals that a proposed residential development site is at much higher flood risk than previously thought based on the newest climate projections. The department asks you to instead use an older climate model that shows lower risk levels, arguing that revealing the true numbers will discourage investment and harm the local tax base. The developers and future homebuyers are unaware of your findings.

Ethical Reasoning Criteria:

- **Ethical Issue Recognition** - Recognizing the cross-relationships between scientific accuracy, public safety, and economic impacts
- **Application of Ethical Perspectives/Concepts** - Applying professional scientific integrity principles to balance competing stakeholder interests

Primary Conflict:

I. Obligations to Society vs. II. Obligations to Employers and Funders

The Ethical Tension:

Society benefits from accurate flood risk information that protects public safety and enables informed decisions about property purchases and emergency planning. However, your employer (the insurance company) wants you to use less accurate models to protect their financial interests and avoid market disruption. You must choose between providing truthful analysis that serves public safety and satisfying client demands for financially favorable results.

This conflict is particularly challenging because it involves **climate change uncertainty exploitation** - where scientific uncertainty about future conditions is used to justify using outdated models, potentially putting lives at risk while avoiding short-term economic disruption to property markets and insurance profits.

Scenario 6: Predictive Policing Bias

A police department contracts your firm to develop predictive policing maps using historical crime data and demographic information. Your analysis reveals the algorithm disproportionately targets minority neighborhoods due to historically biased policing patterns in the data. The police chief dismisses your concerns, saying the maps are "just showing where crime happens." How do you address this perpetuation of systemic bias?

Ethical Reasoning Criteria:

- **Ethical Issue Recognition** - Recognizing algorithmic bias and systemic discrimination within complex, multilayered social contexts
- **Evaluation of Different Ethical Perspectives/Concepts** - Evaluating claims about data objectivity versus social justice perspectives on algorithmic fairness

Primary Conflict:

I. Obligations to Society vs. II. Obligations to Employers and Funders

The Ethical Tension:

Society benefits from policing systems that treat all communities fairly and don't perpetuate historical discrimination against minority populations. However, your client (the police department) dismisses bias concerns and expects delivery of the contracted predictive policing system. You must choose between contributing to potentially discriminatory policing practices and fulfilling professional obligations to your employer.

This conflict is particularly challenging because it involves **algorithmic bias disguised as objectivity** - where historical data containing discriminatory patterns is presented as neutral science, making it difficult to distinguish between legitimate crime prevention and perpetuation of systemic racism through technological tools.

Scenario 7: Border Wall Environmental Study

A federal agency hires you to conduct environmental impact mapping for proposed border infrastructure. Your analysis shows severe ecological damage to endangered species habitats and migration corridors. Agency officials ask you to minimize these findings in your report and exclude certain sensitive wildlife areas from your analysis. How do you balance your professional obligations with political pressures?

Ethical Reasoning Criteria:

- **Ethical Self-Awareness** - Examining core beliefs about environmental protection versus career security and political accommodation
- **Application of Ethical Perspectives/Concepts** - Applying scientific integrity and environmental ethics principles under political pressure

Primary Conflict:

I. Obligations to Society vs. II. Obligations to Employers and Funders

The Ethical Tension:

Society benefits from accurate environmental impact assessments that protect endangered species and ecosystems for future generations. However, your employer (the federal agency) pressures you to minimize environmental concerns to support predetermined policy decisions. You must choose between providing scientifically honest environmental analysis and satisfying political expectations that could harm ecological systems.

This conflict is particularly challenging because it involves **political interference in environmental science** - where predetermined policy decisions override scientific findings, forcing professionals to choose between career security and environmental protection responsibilities that transcend political cycles.

Scenario 8: Competitor Data Theft

Your supervisor asks you to incorporate detailed demographic and market analysis data into a client presentation. When you ask about the data source, you discover it was illegally obtained from a competitor's confidential client database by a colleague who recently left that company. The stolen data would significantly enhance your analysis and help win a major contract. What do you do?

Ethical Reasoning Criteria:

- **Ethical Issue Recognition** - Recognizing intellectual property theft and professional integrity violations in business competitive practices
- **Evaluation of Different Ethical Perspectives/Concepts** - Evaluating business success arguments against professional ethics and legal compliance

Primary Conflict:

III. Obligations to Colleagues and the Profession vs. II. Obligations to Employers and Funders

The Ethical Tension:

Professional integrity requires respecting intellectual property rights and maintaining ethical standards that preserve trust in the GIS profession. However, your employer expects you to use all available data to deliver competitive analysis and win contracts. You must choose between upholding professional ethics and participating in practices that could provide significant business advantages.

This conflict is particularly challenging because it involves **direct complicity in corporate espionage** - where using stolen data provides immediate competitive advantages but undermines the entire foundation of professional trust and legal business practices that the industry depends on.

Scenario 9: Electoral Redistricting Manipulation

You're hired to provide demographic and voting pattern analysis for legislative redistricting. Political party officials make it clear they want maps that maximize their electoral advantage through gerrymandering, even if it violates principles of fair representation. They argue "both parties do it" and threaten to terminate your contract if you don't comply. How do you maintain professional integrity while preserving your livelihood?

Ethical Reasoning Criteria:

- **Ethical Self-Awareness** - Examining core beliefs about democratic fairness versus economic security and professional survival
- **Evaluation of Different Ethical Perspectives/Concepts** - Evaluating democratic principles against pragmatic political realities and economic pressures

Primary Conflict:

I. Obligations to Society vs. II. Obligations to Employers and Funders

The Ethical Tension:

Democratic society benefits from fair electoral representation that gives all citizens equal voice in government. However, your employer (the political party) demands analysis that undermines democratic principles to gain partisan advantage, threatening your economic security if you refuse. You must choose between supporting democratic fairness and maintaining your professional livelihood.

Scenario 10: Oil Spill Cover-Up

An oil company contracts you to map environmental damage from a recent pipeline leak. Your analysis reveals contamination extending far beyond what the company has publicly acknowledged, affecting groundwater used by rural communities. Company executives ask you to redraw contamination boundaries to minimize their liability and cleanup costs. They remind you of your confidentiality agreement and threaten legal action if you share findings with regulators.

Ethical Reasoning Criteria:

- **Ethical Issue Recognition** - Recognizing public health threats concealed by corporate legal intimidation and confidentiality agreements
- **Application of Ethical Perspectives/Concepts** - Applying environmental protection and public health principles against legal and contractual constraints

Primary Conflict:

I. Obligations to Society vs. II. Obligations to Employers and Funders

The Ethical Tension:

Society, particularly affected rural communities, benefits from accurate contamination mapping that ensures proper cleanup and protects public health. However, your employer (the oil company) demands falsified analysis to limit financial liability, using legal threats to enforce compliance. You must choose between protecting public health and honoring contractual obligations under legal pressure.

This conflict is particularly challenging because it involves **corporate legal intimidation to suppress environmental evidence** - where contractual confidentiality agreements and threat of litigation are used to prevent disclosure of public health hazards, trapping professionals between legal vulnerability and moral responsibility.

Scenario 11: Hurricane Evacuation Route Analysis

Your hurricane evacuation modeling reveals that current evacuation routes will fail catastrophically for low-income neighborhoods with limited vehicle access. However, upgrading these routes would be expensive and delay evacuation plans already behind schedule. Emergency management officials ask you to revise your model assumptions to show current routes as adequate. A hurricane season is approaching.

Ethical Reasoning Criteria:

- **Ethical Issue Recognition** - Recognizing life-safety implications and environmental justice issues in emergency preparedness planning
- **Application of Ethical Perspectives/Concepts** - Applying duty-based ethics regarding life-safety versus administrative efficiency and budget constraints

Primary Conflict:

I. Obligations to Society vs. II. Obligations to Employers and Funders

The Ethical Tension:

Society, especially vulnerable low-income communities, benefits from accurate evacuation modeling that could save lives during hurricanes. However, your employer (emergency management) pressures you to falsify results to avoid expensive infrastructure improvements and schedule delays. You must choose between providing life-saving accurate analysis and satisfying administrative preferences for convenient results.

This conflict is particularly challenging because it involves **life-safety analysis under bureaucratic pressure** - where administrative convenience and budget constraints are prioritized over emergency preparedness that could determine survival rates in vulnerable communities during natural disasters.

Scenario 12: Agricultural Chemical Exposure Mapping

A law firm hires you to map pesticide application patterns and cancer clusters for a class-action lawsuit against an agricultural chemical company. Your analysis shows strong spatial correlations between chemical use and health impacts. The chemical company offers you a lucrative consulting contract for unrelated work, but you suspect they want to prevent you from testifying. Meanwhile, affected farming communities depend on your analysis for their legal case.

Ethical Reasoning Criteria:

- **Ethical Issue Recognition** - Recognizing conflicts of interest and attempted expert witness corruption in legal proceedings affecting public health
- **Evaluation of Different Ethical Perspectives/Concepts** - Evaluating professional independence requirements against economic incentives and community justice claims

Primary Conflict:

III. Obligations to Colleagues and the Profession vs. II. Obligations to Employers and Funders

The Ethical Tension:

Professional integrity requires avoiding conflicts of interest and maintaining independence in legal proceedings where your analysis affects public health outcomes. However, economic incentives from the chemical company could provide significant financial benefits while potentially compromising your ability to support your current client's case. You must choose between professional ethics and financial opportunities that could undermine your analytical independence.

This conflict is particularly challenging because it involves **attempted expert witness corruption** - where one party in litigation tries to compromise the independence of expert testimony through financial incentives, undermining the judicial system's dependence on objective scientific analysis.

Scenario 13: Drone Surveillance Authorization

Your consulting firm is developing flight path analysis for a police department's new drone surveillance program. The system would monitor protests, public gatherings, and "high-crime" areas. Your mapping reveals the surveillance disproportionately targets minority communities and political gatherings. Police officials argue the technology will improve public safety and officer response times. Civil liberties groups are unaware of the project's scope.

Ethical Reasoning Criteria:

- **Ethical Issue Recognition** - Recognizing discriminatory surveillance targeting and suppression of constitutional rights in public safety contexts
- **Application of Ethical Perspectives/Concepts** - Applying civil liberties and equal protection principles versus public safety utilitarian arguments

Primary Conflict:

I. Obligations to Society vs. IV. Obligations to Individuals in Society

The Ethical Tension:

Society could benefit from improved public safety and faster police response through drone surveillance technology. However, individuals have rights to privacy, freedom of assembly, and equal treatment, which are threatened by surveillance that disproportionately targets minority communities and political activities. You must balance collective security benefits against individual civil liberties and equal protection rights.

This conflict is particularly challenging because it involves **surveillance technology deployed with discriminatory targeting** - where legitimate public safety applications are undermined by implementation patterns that disproportionately monitor minority communities and political activities, violating equal protection principles.

Scenario 14: Climate Refugee Resettlement

An international aid organization asks you to map optimal resettlement locations for climate refugees using environmental, economic, and social data. Your analysis identifies suitable areas, but you realize that publishing these maps could lead to land speculation, increased costs, and reduced availability for actual refugees. The organization wants to share the maps with governments and other NGOs to coordinate efforts.

Ethical Reasoning Criteria:

- **Ethical Issue Recognition** - Recognizing cross-relationships between humanitarian coordination, market distortions, and unintended consequences
- **Application of Ethical Perspectives/Concepts** - Applying humanitarian assistance principles while considering economic impact and refugee welfare

Primary Conflict:

I. Obligations to Society vs. IV. Obligations to Individuals in Society

The Ethical Tension:

Society benefits from coordinated refugee resettlement efforts that efficiently allocate resources and improve humanitarian outcomes. However, individual climate refugees could be harmed if your analysis triggers land speculation that makes suitable locations unaffordable or unavailable. You must balance effective humanitarian coordination against unintended consequences that could harm the very people you're trying to help.

This conflict is particularly challenging because it involves **humanitarian analysis creating market distortions** - where publishing well-intentioned research to help refugees could trigger economic speculation that makes refugee resettlement more difficult, demonstrating how transparency can sometimes undermine its intended benefits.

Scenario 15: Corporate Acquisition Due Diligence

You're conducting environmental risk analysis for a corporate acquisition, mapping potential contamination, flood risks, and regulatory violations at target company facilities. Your analysis reveals significant undisclosed environmental liabilities that would affect the acquisition price. The acquiring company's executives ask you to minimize these findings in your report to avoid jeopardizing the deal, promising substantial future contracts if you cooperate.

Ethical Reasoning Criteria:

- **Ethical Issue Recognition** - Recognizing environmental due diligence corruption and potential public health implications in business transactions
- **Evaluation of Different Ethical Perspectives/Concepts** - Evaluating business relationship incentives against environmental disclosure and scientific integrity requirements

Primary Conflict:

I. Obligations to Society vs. II. Obligations to Employers and Funders

The Ethical Tension:

Society benefits from accurate environmental risk disclosure that prevents environmental damage and ensures proper cleanup of contaminated sites. However, your employer pressures you to minimize environmental findings to facilitate a profitable business transaction, offering future financial incentives for cooperation. You must choose between environmental protection and honesty versus economic benefits and client satisfaction.

This conflict is particularly challenging because it involves **environmental due diligence corruption** - where accurate risk assessment is suppressed to facilitate business transactions, potentially transferring environmental liabilities to unknowing parties and allowing contaminated sites to avoid proper remediation.

Scenario 16: School District Boundary Manipulation

A school district hires you to analyze demographic and academic performance data for potential boundary changes. Your analysis shows that proposed changes would increase racial segregation and concentrate poverty in certain schools. District officials argue the changes are necessary for budget reasons and better transportation efficiency. Parent groups from affected communities haven't been consulted about the proposed changes.

Ethical Reasoning Criteria:

- **Ethical Issue Recognition** - Recognizing educational equity and civil rights violations disguised as administrative efficiency measures
- **Application of Ethical Perspectives/Concepts** - Applying educational justice and equal protection principles against administrative and budgetary constraints

Primary Conflict:

I. Obligations to Society vs. II. Obligations to Employers and Funders

The Ethical Tension:

Society benefits from educational equity and integrated schools that provide equal opportunities for all students regardless of race or economic status. However, your employer (the school district) prioritizes budget efficiency and administrative convenience over equity concerns. You must choose between supporting educational justice and fulfilling administrative preferences that could perpetuate educational inequality.

This conflict is particularly challenging because it involves **using administrative efficiency to justify educational segregation** - where budget constraints and transportation logistics are used to rationalize boundary changes that increase racial and economic segregation, hiding discriminatory impacts behind seemingly neutral administrative concerns.

Scenario 17: Mining Impact on Indigenous Communities

You're mapping environmental and social impacts of a proposed mining operation near indigenous communities. Your analysis shows potential contamination of traditional fishing areas and sacred sites. The mining company pressures you to exclude certain cultural sites from your analysis, arguing they aren't "officially recognized." Meanwhile, community elders share traditional knowledge that your standard models don't capture and argue that knowledge should be included in your work.

Ethical Reasoning Criteria:

- **Understanding Different Ethical Perspectives/Concepts** - Analyzing Western scientific assessment frameworks versus indigenous knowledge systems and cultural values
- **Evaluation of Different Ethical Perspectives/Concepts** - Evaluating indigenous sovereignty and traditional ecological knowledge.

Primary Conflict:

IV. Obligations to Individuals in Society vs. II. Obligations to Employers and Funders

The Ethical Tension:

Indigenous communities have rights to protect their traditional lands, sacred sites, and cultural practices from environmental destruction. However, your employer (the mining company) pressures you to minimize cultural and environmental impacts to facilitate profitable resource extraction. You must choose between respecting indigenous rights and traditional knowledge versus satisfying client demands that dismiss indigenous concerns.

This conflict is particularly challenging because it involves **Western science versus indigenous knowledge systems** - where traditional ecological knowledge and cultural values are dismissed as unscientific or legally irrelevant, forcing professionals to choose between respecting indigenous sovereignty and meeting conventional impact assessment standards.

Scenario 18: Precision Agriculture Data Ownership

A technology company developing precision agriculture systems asks you to analyze farm productivity data collected from GPS-enabled equipment. Farmers provided this data thinking it would only be used to improve their operations, but the company plans to sell aggregated insights to commodity traders and insurance companies. Your analysis could affect crop prices and insurance rates. Who owns this data and how should it be used?

Ethical Reasoning Criteria:

- **Ethical Issue Recognition** - Recognizing data consent violations and cross-relationships between agricultural assistance and financial market exploitation
- **Understanding Different Ethical Perspectives/Concepts** - Analyzing data ownership frameworks and agricultural technology ethics in market contexts

Primary Conflict:

IV. Obligations to Individuals in Society vs. II. Obligations to Employers and Funders

The Ethical Tension:

Individual farmers have reasonable expectations that their operational data will only be used to benefit their farming operations, not sold to third parties who could use it against their economic interests. However, your employer (the technology company) expects you to analyze this data for profitable resale to financial markets. You must choose between protecting farmers' data rights and fulfilling contractual obligations that could economically harm the data providers.

This conflict is particularly challenging because it involves **agricultural data exploitation** - where farmers' trust in technology providers is violated by converting operational assistance data into market intelligence that could be used against farmers' economic interests by commodity traders and insurers.

Scenario 19: Facial Recognition in Public Spaces

A city contracts you to optimize the placement of facial recognition cameras in public spaces using pedestrian flow analysis and crime statistics. Your modeling shows maximum coverage efficiency, but the system would effectively eliminate anonymity in public spaces. City officials emphasize crime reduction benefits, while civil liberties groups are organizing opposition. How do you balance public safety with privacy rights?

Ethical Reasoning Criteria:

- **Ethical Issue Recognition** - Recognizing the fundamental transformation of public space and elimination of anonymity through surveillance technology
- **Evaluation of Different Ethical Perspectives/Concepts** - Evaluating public safety utilitarian benefits against privacy rights and democratic freedom of movement

Primary Conflict:

I. Obligations to Society vs. IV. Obligations to Individuals in Society

The Ethical Tension:

Society could benefit from reduced crime and improved public safety through comprehensive facial recognition surveillance. However, individuals have rights to privacy and anonymity in public spaces, and surveillance systems create potential for abuse and chilling effects on free expression. You must balance collective security benefits against individual privacy rights and democratic freedoms.

This conflict is particularly challenging because it involves **the elimination of public anonymity** - where facial recognition technology fundamentally changes the nature of public space by making anonymous movement impossible, potentially chilling free speech, assembly, and association rights that depend on privacy.

Scenario 20: Energy Infrastructure Vulnerability Assessment

A utility company asks you to map vulnerabilities in the electrical grid using climate projections, infrastructure age, and failure probability models. Your analysis reveals critical weaknesses that could cause widespread blackouts, but also shows that communities of color and low-income areas have the most vulnerable infrastructure and longest expected restoration times. The utility wants to classify your findings to prevent security threats but also avoid pressure for expensive equity improvements.

Ethical Reasoning Criteria:

- **Ethical Issue Recognition** - Recognizing cross-relationships between infrastructure security, environmental justice, and community transparency rights
- **Application of Ethical Perspectives/Concepts** - Applying infrastructure security requirements against equity disclosure and community empowerment principles

Primary Conflict:

I. Obligations to Society vs. IV. Obligations to Individuals in Society

The Ethical Tension:

Society benefits from grid security and protection of critical infrastructure from potential attacks or failures. However, vulnerable communities have rights to equitable infrastructure and deserve to know about disparities that affect their access to essential services. You must balance infrastructure security concerns against environmental justice and community transparency rights.

This conflict is particularly challenging because it involves **security classification hiding infrastructure inequity** - where legitimate security concerns about critical infrastructure are used to conceal environmental justice problems, preventing vulnerable communities from advocating for infrastructure improvements they need.

Scenario 21: Wildfire Risk Insurance Mapping

An insurance company contracts you to develop wildfire risk models for policy pricing in wildland-urban interface areas. Your analysis shows many existing policyholders live in areas too dangerous to insure profitably. The company plans to use your maps to cancel policies or dramatically increase rates for high-risk areas, potentially making homes uninsurable and unsellable. Homeowners purchased these properties based on previous risk assessments that didn't account for climate change.

Ethical Reasoning Criteria:

- **Ethical Issue Recognition** - Recognizing cross-relationships between climate science advancement, economic impacts, and retroactive risk disclosure
- **Evaluation of Different Ethical Perspectives/Concepts** - Evaluating accurate risk assessment principles against individual economic harm and housing security

Primary Conflict:

I. Obligations to Society vs. IV. Obligations to Individuals in Society

The Ethical Tension:

Society benefits from accurate risk assessment that reflects climate change realities and encourages safer development patterns. However, individual homeowners face financial devastation if their properties become uninsurable and unsellable based on risks that weren't disclosed when they purchased their homes. You must balance truthful risk assessment against economic harm to individual property owners.

This conflict is particularly challenging because it involves **retroactive climate risk assessment** - where improved scientific understanding of climate change creates financial hardship for homeowners who made decisions based on outdated risk information, raising questions about who bears the cost of improved climate knowledge.

Scenario 22: AI-Generated Map Symbolology Plagiarism

Your GIS consulting firm is using generative AI tools to create custom map symbols and cartographic designs for client projects. The AI-generated designs are visually appealing and save significant time, but you discover that some symbols closely resemble copyrighted designs from other cartographers and mapping companies. Your supervisor argues that AI-generated content is legally distinct from the original sources and that the symbols are "inspired by" rather than copied from existing work. A major client presentation is tomorrow, and manually recreating the symbols would require several days of work.

Ethical Reasoning Criteria:

- **Ethical Issue Recognition** - Recognizing AI-mediated intellectual property violations and professional integrity issues in time-sensitive business contexts
- **Evaluation of Different Ethical Perspectives/Concepts** - Evaluating AI-generated content against intellectual property rights and professional ethics standards

Primary Conflict:

III. Obligations to Colleagues and the Profession vs. II. Obligations to Employers and Funders

The Ethical Tension:

Professional integrity requires respecting intellectual property rights of other cartographers and maintaining ethical standards that preserve trust in the GIS profession. However, your employer demands efficient delivery of client work using AI tools that may violate copyright, with significant business consequences if the presentation is delayed. You must choose between upholding professional ethics and intellectual property rights versus meeting client expectations and business deadlines.

This conflict is particularly challenging because it involves **AI-mediated copyright infringement** - where generative AI tools create plausibly deniable intellectual property violations, making it difficult to determine when inspiration becomes plagiarism while business pressures demand rapid delivery regardless of copyright concerns.

Scenario 23: AI-Assisted Environmental Impact Fabrication

An environmental consulting firm asks you to use generative AI to help write environmental impact assessments for development projects. The AI can rapidly generate detailed technical reports by combining data from your GIS analysis with text from thousands of previous environmental studies. However, you notice the AI sometimes fabricates supporting evidence, creates plausible-sounding but false scientific citations, and generates overly optimistic impact projections when the actual data suggests significant environmental concerns. The client is impressed by the comprehensive reports and quick turnaround time.

Ethical Reasoning Criteria:

- **Ethical Issue Recognition** - Recognizing AI hallucination and scientific integrity violations in environmental assessment with potential ecological consequences
- **Application of Ethical Perspectives/Concepts** - Applying scientific accuracy and environmental protection principles against AI efficiency and client satisfaction demands

Primary Conflict:

I. Obligations to Society vs. II. Obligations to Employers and Funders

The Ethical Tension:

Society benefits from accurate environmental impact assessments that protect ecosystems and public health through honest scientific analysis. However, your employer values the efficiency and impressive presentation of AI-generated reports, even when they contain fabricated evidence and false conclusions. You must choose between maintaining scientific integrity and environmental protection versus satisfying client demands for rapid, comprehensive-looking reports regardless of accuracy.

This conflict is particularly challenging because it involves **AI hallucination in environmental assessment** - where generative AI creates convincing but false scientific evidence that could lead to environmental damage, while the efficiency gains make it difficult to resist using AI tools that undermine scientific accuracy.

Scenario 24: AI-Generated Property Valuations and Housing Discrimination

Your real estate technology startup uses generative AI to create automated property valuations by analyzing GIS data including neighborhood demographics, infrastructure, school districts, and environmental factors. The AI consistently generates lower property valuations for homes in predominantly minority neighborhoods, even when controlling for property characteristics. This affects mortgage approvals, insurance rates, and homeowners' wealth. When you raise concerns about potential discrimination, company executives argue the AI is simply reflecting "market realities" and that manual intervention would make valuations less accurate and efficient.

Ethical Reasoning Criteria:

Ethical Issue Recognition - Recognizing AI perpetuation of wealth inequality and housing discrimination disguised as market objectivity

Evaluation of Different Ethical Perspectives/Concepts - Evaluating fair housing and anti-discrimination principles against market efficiency and AI accuracy arguments

Primary Conflict:

I. Obligations to Society vs. IV. Obligations to Individuals in Society

The Ethical Tension:

Society benefits from fair housing practices that don't perpetuate racial discrimination in property values and wealth accumulation. However, individual homeowners in minority communities are economically harmed by AI systems that systematically undervalue their properties, affecting their ability to build wealth and access credit. You must address systemic discrimination while balancing the interests of all affected individuals and communities in equitable property valuation systems.

This conflict is particularly challenging because it involves **AI perpetuating wealth inequality through property valuation** - where machine learning systems trained on historically discriminatory market data continue to depress property values in minority communities, systematically undermining wealth accumulation while being defended as reflecting "market reality."

Scenario 25: Rapid Flood Risk Modeling & Infrastructure Equity

You work for a city using GIS to quickly prioritize flood infrastructure upgrades before funding deadlines. The model uses readily available data: elevation, rainfall history, storm drain locations, and past flood claims. To save time, it simplifies complex factors like soil variation and drain conditions. The model consistently recommends investing in wealthier areas with robust historical data. Lower-income neighborhoods (often historically marginalized) are deprioritized due to: (1) Incomplete drainage data in older areas; (2) Underreported past flood claims; and (3) Simplified modeling assumptions. When you raise equity concerns, leadership argues the model is "data-driven and efficient," and that delays for better data collection risk missing the funding window entirely.

Ethical Reasoning Criteria:

Ethical Issue Recognition - Recognizing that prioritizing speed and available data perpetuates environmental injustice by systematically deprioritizing vulnerable communities already at higher risk due to historical underinvestment.

Evaluation of Different Ethical Perspectives/Concepts - Evaluating the concept of Efficiency/Consequentialism against distributive justice and professional integrity

Primary Conflict:

I. Obligations to Society vs. IV. Obligations to Employers and Funders

The Ethical Tension:

Employers/Funders demand speed and efficiency using readily available data, arguing delaying for equity risks losing funding entirely. Society demands fair outcomes and corrective justice, arguing rushed models sacrifice vulnerable lives to false 'objectivity' and reinforce cycles of harm. This forces you to choose between: fulfilling institutional goals (secure funding quickly), or advocating for societal equity (demand better data/methods to protect marginalized communities).