A Letter from the Guest Editors

INTRODUCTION TO ETHICS IN CARTOGRAPHY

This special issue of *Cartographic Perspectives (CP)* focuses on ethics in cartography—a theme that has found its way into this publication a number of times since the inception of *CP*. The first *CP* article on ethics appeared in the seventh issue, in 1990, when Patrick McHaffie and his colleagues shared a roundtable commentary on "Ethical Problems in Cartography" from the perspectives of cartographers in government, the private sector, and academia. In the tenth issue, in 1991, Mark Monmonier wrote about "Ethics and Map Design," and Brian Harley asked, "Can There be a Cartographic Ethics?" In 1999, Michael Peterson wrote about "The Web and Ethics in Cartography," and Matthew McGranaghan wrote "The Web, Cartography and Trust." In 2006, Tom Koch explored "Ethics and Mapping as a Profession," and in 2008, a dialog between Mark Denil ("Manifestos") and Steven Holloway ("Response to Mark Denil's 'Manifestos'") focused on **Steven's 2007 poster**, "Right MAP Making," which outlined five fundamental principles of ethical mapmaking. We now tackle the subject again, this time in a full issue dedicated to ethics in cartography.

In this introduction, before describing what you can look forward to in this issue, we cover some general concepts about cartographic ethics, including its definition, importance, key themes, and stakeholders.

DEFINITION

The Merriam-Webster **dictionary defines** *ethics* as "the principles of conduct governing an individual or a profession." David DiBiase, in his article in this special issue, offers us this definition of *geospatial ethics*:

> "Ethics" refers here to questions of right and wrong that arise in applications of geospatial technology, data, and methods. "Ethical" geospatial professionals and organizations know how to respond to such questions with insight, empathy, and integrity.

The International Cartographic Association (ICA) **defines *cartography*** as "the discipline dealing with the art, science and technology of making and using maps." Combining this definition of cartography with the previous definitions of ethics, we can describe cartographic ethics as principles of conduct governing our response to ethical and moral questions of right and wrong that relate to the nature, creation, and use of cartographic data, methods, technologies, and products.

However, perhaps the bounds of cartography are not so clear as the ICA's wording might make it seem. We see cartography as an integrative field—one that draws from other fields to, **in the words of** Merriam-Webster, "form, coordinate, or blend into a functioning or unified whole." Those elements which it draws upon include models of practice from the arts (like critique) and sciences (like evidence-based rigor), and a focus on taking advantage of rapidly evolving tools and technology that we see in many technical and craft fields. Cartography is also integrative because its *practitioners* come to mapmaking from a wide variety of disciplines and industries. In practice, cartography integrates the thinking and doing of mapmakers who are formally trained in the subject (often within the academic discipline of geography) with the thinking and doing of people with a wide variety of other backgrounds—graphic design, software development, journalism, business management, surveying, military operations, urban planning, environmental management, and more.

As an integrative field, ethical issues in cartography must also interact with ethics in the fields of art, science, and technology, as well as graphics, communication, and others. This places cartography in a unique position of sharing values with its complementary fields while grounding those values in the fundamental form of cartographic expression—a map. For example, values of accuracy, neutrality, and reduction of distortion, which are relevant in communication and science, are also important ethical considerations in cartography. Ethical values in graphic arts, such as respect for intellectual property and authenticity, also relate to cartography. Ethics issues related to technology, like privacy, data protection, and security, are also pertinent to cartography. Furthermore, ethics in cartography are applicable not only to trained professionals, but anyone creating, using, publishing, preserving, archiving, and developing methods and software for maps.

IMPORTANCE

The issue of ethics in cartography is crucial for several reasons. Maps have a profound impact on how we perceive and interact with the world, and they can shape our understanding of myriad facets of our environment, like territories, boundaries, and cultural landscapes. Cartography plays a vital role in decision-making processes—governments, organizations, and individuals rely on maps to make informed choices about resource allocation, urban planning, disaster management, and more. When maps are created with attention to ethical issues, based on reliable information, and made with analytical integrity, decision makers have better tools to help them understand issues and find solutions.

Additionally, maps—either deliberately or inadvertently—have social, political, and economic implications. They can perpetuate existing power dynamics, reinforce stereotypes, or marginalize certain communities. Ethical cartography aims to challenge these biases and promote inclusivity, fairness, and social justice in map representation. By considering the diverse perspectives and needs of different communities, we can create maps that more accurately reflect the world we live in. In summary, ethics in cartography encourages important topics such as accuracy, reliability, fairness, and inclusivity to be considered in map creation and use. Cartographic ethics are essential for maintaining the integrity of maps, and, by extension, supporting informed decision making that benefits society.

KEY TOPICS

There are a range of principles and factors that guide ethical practice in cartography. Here, we describe some key topics. ***Privacy and security*** considerations aim to reduce the risks of exposing confidential, personal, or sensitive information in the collection, storage, and sharing of geospatial data. Disclosure and attribution of ***data sources and provenance*** allows mapmakers and map users to evaluate the reliability and accuracy of map data. ***Analytical integrity*** with regard to data quality, statistical validity, transparency, and reproducibility enable assessment of the reliability and accuracy of data handling and analysis. ***Inaccuracy and misrepresentation*** through distorted or falsified visual representation can lead to misinformation. Adhering to ethical standards and guidelines in all stages of data collection, analysis, and graphic representation are essential for ethical mapmaking.

Maps are models of the world that people use to guide their actions. While models can be powerful tools for understanding and predicting complex systems, it is essential to be aware of their limitations. For example, maps have the potential to perpetuate ***bias and stereotypes*** by selectively including or excluding features or using biased labeling or symbols. By striving to present information in a fair and unbiased way, cartographers can enhance the quality, accuracy, and fairness of maps. ***Cultural sensitivity*** should be considered because maps should respect the cultural values and sensitivities of different communities. This consideration is especially important in order to avoid misrepresentation, for example, of Indigenous and culturally significant places, which could have detrimental ramifications such as misappropriation of resources. Maps can also have an ***environmental impact***, such as promoting sustainable or unsustainable development or contributing to habitat preservation or destruction, depending on how complex phenomena are simplified and abstracted in a mapped representation.

Awareness of ***law and policy*** helps cartographers to avoid legal issues and potential liabilities related to data privacy, intellectual property rights, access and use restrictions on data, and more. Attention to ***workplace ethics*** promotes an environment in which cartographic professionals can uphold integrity, trust, and accountability in their work by emphasizing professional conduct, respect for diversity, conflict resolution, professional development, and confidentiality.

Technological advancements have had a significant impact on cartographic ethics. The ease of creating and disseminating maps through digital platforms has increased the risk of ***misinformation and manipulation***. Cartographers should be cautious about the accuracy and reliability of their data sources and ensure that their maps are not used to mislead or misinform readers. Technology has the potential to improve map ***accessibility*** for individuals with disabilities so they can access and use maps effectively; however, it also raises challenges in terms of ensuring equal access to maps for all users, including removing barriers to access and bridging skills gaps. The use of artificial intelligence in cartography raises issues of ***bias and fairness*** because AI algorithms can inadvertently introduce biases based on their training data, leading to unfair or discriminatory outcomes. For example, a mapping algorithm that relies on historical data that does not reflect current demographics in a particular area can lead to biased outcomes. Cartographers need to be aware of these biases and strive for fairness and inclusivity in their use of AI for mapping. The use of Al and automation in cartography also raises questions about the role of ***human judgment and expertise***. While these tools can enhance efficiency, it is essential to strike a balance between automated

processes and human decision making to ensure the accuracy and appropriateness of maps. It is crucial for cartographers to stay informed about emerging technologies, engage in ongoing discussions, and propose ethical guidelines to navigate these challenges responsibly.

STAKEHOLDERS

Ethics in cartography should be a concern for a variety of stakeholders, including cartographers, geographers, researchers, policymakers, educators, and the general public. ***Cartographers*** create maps to facilitate understanding, support navigation, visualize data, tell stories, and play a crucial role in various forms of communication across different contexts and disciplines. Attention to ethical practices promotes the integrity and credibility of the cartographer's work to support these map uses. Because ***geographers and researchers*** rely on maps as a fundamental tool in their research and analysis, ethical cartography increases the probability that their maps provide reliable and trustworthy information. When ***policymakers*** use maps to inform decision-making processes, such as urban planning, resource allocation, and disaster management, the products of ethical cartography help them make better-informed choices for the benefit of society. For ***educators*** teaching about cartography, instilling an understanding of the importance of ethics in map creation and interpretation helps students critically evaluate maps and consider their social, cultural, and other implications. Maps for the ***general public*** shape our perception of the world and influence how we navigate and interact with our surroundings. Ethical cartography aims to ensure that maps are fair, inclusive, and free from biases, benefiting everyone who uses them.

THIS ISSUE OF CP

As mentioned in the beginning, cartographers are practitioners in an integrative field that draws ideas, techniques, and practitioners from many other fields, and those other fields often have their own ethical principles and guidelines. Additionally, cartographers support different kinds of clients and end users, including urban and regional planning, teaching and research, environmental and conservation efforts, technological services (for example, geospatial services and software development), natural resource management (in forestry, agriculture, water resources, oil and gas, and other areas), telecommunications and navigation, health and epidemiology, tourism and recreation, and security and defense. Each of these audiences may also have associated ethical principles and guidelines.

Although those ethical principles and guidelines are important, and it would be illuminating to see an accounting of them, that was not the focus of this special issue of *CP*. Instead, we wanted to get a better sense of the kinds of ethical issues that cartographers encounter in their work—and how they grapple with them. In one of our many conversations about this special issue, Nat noted, "It's not the framing *per se* but the *use* of that framing" in which we are interested. We wanted to learn about how cartographers "respond to questions of right and wrong … with insight, empathy, and integrity," to borrow from David's definition of geospatial ethics.

To that end, we issued this call for contributions:

> We are looking for short (1000–3000 word; shorter if need be) texts that address ethical dilemmas you have encountered in the map world, and how they were or were not resolved. We are looking for variety in every dimension we can think of—what

> sector of the map world you work in, what kind of issues you are dealing, and the cultures the conflict comes out of.
>
> What we want is less theory and more practice: it's the wrestling with ethical quandaries we are interested in. We are just fine with describing conflicts that aren't resolved. Not all ethical issues are neat and simple—this is part of the point of view we are working from.

We hoped to learn about issues that people felt were related to their conception of cartographic principles, and how those issues aligned, intersected, or conflicted with other ethical issues. For example, how might ethical principles related to science conflict with ethical principles in communication, or how might principles of transparency conflict with principles of data privacy. These insights are important because few cartographers are bound by a formal code of professional ethics; our actions and decisions are governed by suggestions, guidelines, principles, and codes from a variety of other sources. And the practical nature of our work forces the issues because, in the end, there is a product that reflects the choices we made which can be scrutinized and judged. Part of that judgement can be passed on us, as ethical actors, but also on our profession, as the stage we act upon.

In response to our solicitation, we received a number of manuscripts, which we call "case studies," that constitute the majority of this special issue. These contributions were submitted by colleagues in government, academia, and the private sector; by students, teachers, and seasoned practitioners; and by people from different cultures and with different backgrounds. Taken together, we believe this collection provides a broad, though not exhaustive, range of ethical concerns and challenges encountered by people undertaking cartographic work. The case studies illustrate diverse challenges faced by these cartographers—and diverse responses. Some (like **Seda Şalap-Ayça** and **Daniel P. Huffman**) focus on personal actions and conscience. Others (like **Leo Dillon** and **Daniel E. Coe**) describe ethical challenges within the context of institutional systems. Some (like Leo) address issues we recognize to be grounded in cartography, including place names and disputed boundaries, or related disciplines, like graphic communication (in the anonymous graphics reporter's case study). Still others struggle with ethical issues that arise from the integration of cartography with other fields (such as linguistics and Indigenous cultures in **Kim Shortreed**'s case study; and conservation and biological anthropology, among others, in the case study by **Laura C. Loyola** and her colleagues). Still others (like **Lily Houtman** and their colleagues, and **Aaron Adams** and his colleagues) illuminate the challenges of making maps in an environment that did not have codified ethics to apply to their situation.

The stories shared with us also range from the technical, like Daniel Coe's and Lily's approaches to ethical solutions through symbology, to socially-oriented responses to situations, like Daniel Huffman's and Kim's thoughtful changes in their dealings with other people. Some cartographers shared reflections of inadequacies—**Caglar Koylu** and **Alice Bee Kasakoff** describe confronting "the inherent complexities and biases in [their] historical data collection," and **Mairéad de Róiste** recounts the lack of "soft skills" that would have allowed her to question "a task that should have required a pause for at least some ethical consideration." Others confess to shortcomings, like Laura and her colleagues, who divulge that their solutions "do not address the underlying ethical issues of how power can be embodied in place names." Others admitted occasional defeat, like Leo, who noted in the summary of one of his three "episodes" that, "Established practice and rule-based order, it seemed, would take

a back seat to optics. As a civil servant whose career was guided by professional ethics, that was a hard reality to swallow."

Many of the cartographers willingly imparted words to the wise or calls to action. Mairéad's experience led her to "advocate here for the importance of practical ethics in geospatial education." Daniel Huffman crafted "a sort of poem, or perhaps series of aphorisms" for critiquing with empathy. Daniel Coe reminds us to be "cognizant of how [mapped] information could be used in detrimental ways." Kim's map "strives to champion Indigenous toponymic resurgence and awareness." Lily and their colleagues commend "the impact of collaboration" that "combined and collective knowledge" brings to inclusive map design. Caglar and Ann conclude, "it's about shaping a more equitable and comprehensive understanding of history that honors the diversity of all its participants." Aaron and his colleagues share with us this parting observation: "We must also ensure that we do not contribute to the infodemic through poor cartographic decisions, which can only be achieved by working ethical strategies into our workflows from the beginning of a project."

As **Nat Case**'s following letter in this special issue recounts, we struggled with a number of submissions that were less about ethical problem solving, which was our focus for this special issue, and more about the emotional load of ethical issues that the authors did not feel empowered to address. Although we ultimately decided to not include these pieces, they emphasized for us how important "power" is within ethical discussions and how much our personal ethical instincts start with *feelings* of right and wrong, rather than codified principles. This supports our definition of ethics as "principles of conduct governing our response to ethical and moral questions of right and wrong" that relate to cartography, but it points to the need to take into consideration the impetus for ethics, which may not be so clearly codifiable.

We also solicited two peer-reviewed articles to include in this special issue's discussion of ethical issues in cartography—not to provide a set of ethical principles, but to structure and give more precise language to that discussion. As the orchestrator of the roundtable discussion that first broached the subject of ethics in this publication in 1991, then-editor of *CP* **David DiBiase** is perfectly positioned to reflect on the evolution of primary ethical concerns in cartography. He also describes a case study approach to teach ethics in a college-level cartographic and GIScience curriculum, and he demonstrates how the "cases" in this special issue can be adapted to help "hone geospatial professionals' and organizations' ethical problem-solving abilities." **Nat Case**, **Timothy J. Prestby**, and **Georg Gartner**'s paper grew out of informal discussions at the International Cartographic Conference in Cape Town in August 2023, where multiple speakers referred to the idea that "people trust maps." Struck by how little foundational work had been done on trust in maps, they developed their article by drawing from trust studies in a variety of other fields to formulate a basic language for continued discussion of trust in maps within the field of cartography.

Thomas Pingel's submission was an anomaly, fitting neither the case study nor peer-reviewed article categories. We were enthusiastic to include his article because it directly targeted the issue of objectivity—a principal tenet in scientific ethics—and subjectivity—a counterpoint in critical cartography. Thomas concludes, "The challenge before us is not to choose between objectivity and subjectivity, but to thoughtfully integrate both approaches in service of deeper understanding. By doing so, we can create spatial narratives and visual

stories that are both compelling and comprehensive, that acknowledge our individual perspectives while still reaching for broader truths."

CONCLUSION

As David notes in his article, "ethics is a multifaceted concept that tends to reflect the point of view of the person or group that's thinking about it. We should expect that different individual practitioners and groups within cartography and GIS will have different perspectives on ethics. If true, then the more practitioners and groups that are invited to reflect on ethics in cartography, the more kaleidoscopic the view is likely to become." He goes on to suggest that there is the "possibility that consensus may recede, rather than emerge, from inclusive conversations about ethics." Our introduction to this special issue, and indeed the contents of this issue, may seem to support David's speculations. Nonetheless, it is also evident that there are some key topics that repeatedly come up (bias, transparency, privacy, cultural sensitivity), and it is likely that there are some core principles that cartographers would agree are integral to ethical cartography (honesty, accountability, integrity). It is also likely that the majority of cartographers would be interested in preserving trust in maps so that their credibility is not eroded, as has been the case for so many other forms of information communication in the digital age. Although this special issue offers significantly less than a set of guiding principles or a code of ethics for cartography, perhaps it will serve as an important step in that direction.

It is our hope that this *CP* special issue can help to elevate ethical awareness in the education, training, and professional practice of cartographers and mapmakers. We also hope it highlights the enthusiasm that cartographers have for sharing their thoughts about and experiences with ethical issues relating to our work.

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We thank all the authors who contributed to this special issue, and the *CP* editors, Jim Thatcher and Daniel Huffman, for their tireless work in bringing this issue together. We recognize the accommodations the *CP* editors had to make for the case studies, which do not fit into one of the traditional section categories for this publication, and we appreciate the juggling they had to do to fit all this special issue's pieces into a single cohesive whole.

Aileen R. Buckley & Nat Case
Guest Editors

REFERENCES

Denil, Mark. 2008. "Manifestos." *Cartographic Perspectives* 60: 5–13. **https://doi.org/10.14714/CP60.228**.

Harley, J. B. 1991. "Can There Be a Cartographic Ethics?" *Cartographic Perspectives* 10: 9–16. **https://doi.org/10.14714/CP10.1053**.

Holloway, Steven R. 2008. " Just to Make Clear ' Where the Roots Come From': A Response to Mark Denil's 'Manifestos.'" *Cartographic Perspectives* 60: 14–21. **https://doi.org/10.14714/CP60.229**.

Koch, Tom. 2006. "'False Truths': Ethics and Mapping as a Profession." *Cartographic Perspectives* 54: 4–15. **https://doi.org/10.14714/CP54.343**.

McGranaghan, Matthew. 1999. "The Web, Cartography and Trust." *Cartographic Perspectives* 32: 3–5. **https://doi.org/10.14714/CP32.624**.

McHaffie, Patrick, Sona Karentz Andrews, Michael Dobson, Anonymous, and Anonymous. 1990. "Ethical Problems in Cartography: A Roundtable Commentary." *Cartographic Per*spectives 7: 3–13. **https://doi.org/10.14714/CP07.1095**.

Monmonier, Mark. 1991. "Ethics and Map Design: Six Strategies for Confronting the Traditional One-map Solution." *Cartographic Perspectives* 10: 3–8. **https://doi.org/10.14714/CP10.1052**.

Peterson, Michael. 1999. "Maps on Stone: The Web and Ethics in Cartography." *Cartographic Perspectives* 34: 5–8. **https://doi.org/10.14714/CP34.612**.