[GS-02-012] Ethics for Certified Geospatial Professionals

Abstract

This entry discusses ethics for certified geospatial professional, focusing on the Codes of Ethics for the American Society for Photogrammetry and Remote Sensing (ASPRS) and the GIS Certification Institute (GISCI). The entry begins by defining and discussing ethics, while providing some history of the evolution of ethics in the GIS community. It then compares and contrasts the ethical guidelines of GISCI and ASPRS, including sanctions that may be imposed upon individuals who have violated their codes of ethics. The entry concludes with a discussion of how certified professionals may address situations in which their codes of ethics may conflict with their employers' proprietary interests.

Keywords: code of ethics, ethical aspects, practical wisdom, professional ethics, virtue ethics

Author & citation

Obermeyer, N. J. (2021). Ethics for Certified Geospatial Professionals. The Geographic Information Science & Technology Body of Knowledge (2nd Quarter 2021 Edition), John P. Wilson (ed.). DOI: 10.22224/gistbok/2021.2.6.

This Topic is also available in the following editions:

DiBiase, D., DeMers, M., Johnson, A., Kemp, K., Luck, A. T., Plewe, B., and Wentz, E. (2006). Code of ethics for geospatial professionals. The Geographic Information Science & Technology Body of Knowledge. Washington, DC: Association of American Geographers.

Explanation

1. Definitions
2. Ethics in the GIS Community
3. Ethical Guidelines of GISCI and ASPRS
4. Potential GIS Code of Ethics Conflicts
5. Sanctions Imposed by ASPRS and GISCI
6. Conclusion

1. Definitions

Professional ethics: professional ethics are the accepted rules and values that guide the way a professional acts, behaves, and works (Crosswell 2009).

Code of ethics: a code of ethics addresses a range of moral norms; legal boundaries, compliance with organizational rules; personal traits of honesty, integrity, trust, and fairness; and professional competency (Crosswell 2009; Craig 1993)

Virtue ethics: virtue ethics emphasizes moral character and virtuous behavior; virtue

ethics goes beyond a written code of ethics because it does not tell professionals “what to do,” but rather seeks to guide them regarding “what to be” (Hursthouse 2007)

Practical wisdom: the knowledge or understanding that enables its possessor to “do the right thing” as through having internalized good intentions that lead to good and appropriate actions (Hursthouse 2007).

2. Ethics in the GIS Community

The GIS community began its discussion of professional competency, responsibility, and ethics in the first half of the 1990s (Linden 1991, Craig 1993; Crampton 1995; Curry 1995; Onsrud 1995). These discussions were spurred by the rapid growth in the use of geographic information systems and technology that was in turn fostered by the National Science Foundation’s creation of the National Center for Geographic Information and Analysis (NCGIA) in 1988, whose mission was to make this technology more widely available. Over the years, improvements that made software and hardware more available and easier to use, along with greater access to base maps and data, increased access to geographic information and expanded the number of people employed in the GIS profession. The GIS Certification Institute (GISCI) website notes that the U.S. Department of Labor predicted that by 2020, 675,000 geospatial professionals would be employed in the U.S. (https://www.gisci.org). As the GIS professional community grew and as the use of the technology expanded, concerns about ethical behavior also grew. “The GIS profession needs a code of ethics,” noted Craig (1993:13).

A code of ethics addresses a range of moral norms; legal boundaries, compliance with organizational rules; personal traits of honesty, integrity, trust, and fairness; and professional competency (Craig 1993; Crosswell 2009). DiBiase (2017) notes that a code of ethics “…stands as a defacto consensus of the special obligations of GIS professionals.” Furthermore, “To be most effective, a professional code of ethics should be tied to an organization that represents a large portion of members of that profession” (Crosswell 2009: 108). Crosswell also stresses the importance of oversight, reporting of violations and the potential for sanctions for ethics violations.

While a code of ethics and rules of conduct provide specific directions to professionals on a core set of principles, they cannot provide guidance for each and every challenge that a professional faces. In order to address specific ethical challenges, professionals (including GIS professionals) must also recognize the importance of virtue ethics, including practical ethics, as a complement to professional codes of ethics and rules of conduct (Bright et al. 2006; Chun 2005; Arjoon 2000; Harvey 2014).

Bright et al. (2006:250) explain the complementary nature of rules of conduct and practical wisdom through the perspective of a continuum. In this example, unethical behavior is on the left side of the continuum: at this end of the continuum the focus is on “prevention of wrong.” Codes of ethics and rules of conduct would be located in the middle, roughly equivalent to “what is merely expected in ethical conduct” (p. 250). At the right side of the continuum are “virtuous-driven behaviors,” emphasizing “promotion of good.” Together with codes of ethics and rules of conduct, virtue ethics and practical wisdom inform the behavior of professionals.

Having laid this groundwork, the next section of this entry discusses the codes of ethics for GIS professionals as adopted by the American Society for Photogrammetry and Remote Sensing (ASPRS) and the GIS Certification Institute (GISCI).

3. Ethical Guidelines of the GISCI and ASPRS

While there are multiple professional organizations for GIS professionals, this entry focuses on two of them. The American Society for Photogrammetry and Remote Sensing (ASPRS), founded in 1934 was chosen based on its longevity (nearly ninety years). The GIS Certification Institution was chosen because of the large number of professionals (more than 10,000) that it has certified. In addition, certified members of these professions hold professional assignments in a wide array of fields where GIS is used, rather than specializing in one single area.

(Another up-and-coming professional organization, the United States Geospatial Intelligence Foundation – USGIF – is "…dedicated to promoting the geospatial intelligence tradecraft," (USGIF 2021) an implementation of GIS that clearly has ethical ramifications. USGIF is building its membership and may be a candidate for inclusion in later iterations of this entry.)

Both ASPRS and GISCI offer certification to individuals specializing in any and all areas of GIS. In addition, as its name implies, ASPRS offers certification in several other specialties: photogrammetry; Lidar; remote sensing; and unmanned autonomous/aircraft systems (UAS). As of January 2021, GISCI had certified just over 10,000 GIS Professionals, while ASPRS has certified 500 professionals across all five categories within its domain (ASPRS 2021; GISCI 2021; Jordan 2021).

Both organizations identify ethics as an important part of their core missions. ASPRS specifies that its mission is "…to advance knowledge and improve understanding of mapping sciences to promote the responsible applications of photogrammetry, remote sensing, geographic information systems (GIS) and supporting technologies" (ASPRS 2019). GISCI states that "Ethics are extremely important to GISCI" and that it seeks "…to improve the ethics of GIS professionals by remaining vigilant and strong" (GISCI 2019).

In fact, certified professionals in both organizations must acknowledge their certifier's code of ethics in order to gain and retain certification. GISCI requires that new and re-certified professionals must read and sign an agreement to abide by the organization's code of ethics (GISCI.org 2021). The ASPRS asks those who apply for certification to respond to this question: "Which aspect of the code of ethics is most important to you? (Jordan 2021).

Not surprisingly, there are significant similarities in the codes of ethics of ASPRS and GISCI. For example, both organizations identify obligations to society, employers, colleagues and the profession of GI Science. Both organizations share similar foundations in their effort to promote ethical behavior among their members. And both organizations call on their members to perform ethically in multiple areas. This section describes these elements of the two organizations' codes of ethics.

It is worth mentioning that both organizations' codes of ethics are available on their respective websites. GISCI includes additional information on its website that includes its

Rules of Conduct, an extensive Ethics Manual (GISCI 2010), and an “Ethics Charge Submission Form” (GISCI 2021).

3.1 Ethical Obligations to Others

There is a great deal of overlap in the groups of people to whom members of ASPRS and GISCI have ethical obligations. The GIS Certification Institute identifies “Society as a whole” as the first group on its list; while ASPRS includes “Society at large,” this group is fourth on the list. At the top of the ASPRS list is the professional’s employer; GISCI puts employers (and funders) second on their list. ASPRS lists Clients as second on their list; GISCI does not specifically mention clients. Both organizations list “Colleagues” third on their lists. ASPRS describes them as “Colleagues and Associates,” while GISCI describes “Colleagues and the Profession.” The GIS Certification Institute also includes “Individuals in Society” as a focus of ethical obligations, while the American Society for Photogrammetry and Remote Sensing does not mention individuals in society (ASPRS 2021; GISCI 2021).

To summarize, both groups identify Society, Employers, and Colleagues as groups to which their members have an obligation to behave ethically. ASPRS includes Associates and Clients; while GISCI includes Funders, the GIS Profession, and Individuals in Society.

1. **3.2 Ethical Foundations**

In terms of the foundations of their requirements for ethical behavior, there are again many similarities between ASPRS and GISCI. For example, ASPRS stresses the importance of honesty, justice, and courtesy as foundations for moral philosophy and for the ethical behavior of its members. The organization emphasizes the importance of mutual interest among people. Similarly, GISCI calls on its members to “Always treat others with respect” and “never as a means to an end.” In addition, members are encouraged to show concern for others. These guidelines imply the importance of virtue ethics and practical wisdom, but do not go into specific details.

GISCI specifically calls on its members to commit themselves to ethical behavior and to take positive action, rather than merely to avoid specific negative acts. While the ASPRS code of ethics strongly implies this concept, it does not express it in a specific manner.

Both organizations specifically identify ethical areas that are unique to geographic information sciences and technology. In particular, both organizations encourage their members to exchange information and make their data and findings available to others. GISCI specifies that its certified professionals must also document the data, be actively involved in data retention and security, show respect for copyright, and display concern for sensitive data about individuals (GISCI 2021).

3.3 Ethical Guidelines

3.3.a Obligations to Society

In describing specific ethical actions, differences between ASPRS and GISCI become more apparent. For example, both organizations suggest that its members have an obligation to society. ASPRS (2021) suggests that its members must “…be guided in all professional activities by the highest standards.” GISCI (2021) calls on its members to “Do the best work possible” and “Strive to do what is right, not just what is legal.” In addition, GISCI (2021)

asks its members to “Contribute to the community to the extent possible, feasible, and advisable,” and to speak out about public issues related to the field. ASPRS has no similar guidelines.

3.3.b Obligations to Employers

With respect to obligations to employers (and funders or clients), both ASPRS (2021) and GISCI (2021) require that their members must be qualified for each and every project or assignment that they take on. Both organizations require that their members must keep current in the field and make the effort to improve their skills and knowledge throughout their careers. GISCI goes on to specify that its members must have a professional relationship with their employers or funders. This relationship requires that GISPs (GIS Professionals) maintain confidentiality on any proprietary information, which includes developing and implementing rules related to data security, backup, retention, recovery, and disposal (GISCI 2019). The ASPRS code of ethics does not include such specific language.

3.3.c Obligations to Colleagues

Both ASPRS and GISCI identify obligations to colleagues. (As noted above, ASPRS adds “associates” while GISCI adds “the profession” to this obligation.) Both organizations specify the need to respect the work of others and to properly recognize and cite the work of others. Specifically, ASPRS (2021) calls on its members to “Give appropriate credit to other persons and/or firms for their professional contributions” and to “Recognize proprietary, privacy, legal, and ethical interests and rights of others.” GISCI (2021) directs its members to cite the work of others and honor the intellectual property rights of others.

ASPRS speaks to another important issue: unfair competition with others in the geospatial profession. Specifically, ASPRS (2021) calls on its members to avoid “advertising in a self-laudatory manner.” Certified ASPRS professionals must also avoid monetarily exploiting one’s own employment position, and exercising undue influence or pressure or soliciting favors by offering monetary inducements. GISCI’s Rules of Conduct (2019) includes similar guidelines.

Both organizations discourage public criticism of other professionals working in the mapping sciences; however, GISCI specifically calls on its professionals to “Accept and provide fair critical comments on professional work.” The GISCI Rules of Conduct (2019) specifically require that if a GISP sees evidence of another GISP violating the GISCI Code of Ethics, s/he “…shall discuss ethical work practices with this other person.” If the issue is not resolved, the GISP is then required to bring the issue to the attention of the GISCI ethics officer (GISCI Rules of Conduct 2021). The ASPRS code of ethics does not include a similar requirement.

Both ASPRS and GISCI encourage members to help colleagues and others employed in geospatial sciences in their professional development. ASPRS (2021) specifically mentions persons under the supervision of the certified ASPRS professional. GISCI (2021) specifically suggests that “special attention should be given to underrepresented groups whose diverse backgrounds will add to the strength of the profession.”

3.3.d Obligations to Individuals in Society

As previously noted, GISCI calls on its certified professionals to uphold its obligations to individuals in society, while ASPRS does not refer specifically to individuals. Within this category of obligations, GISCI calls on its GISPs to protect individual privacy. This includes being careful "…with new information discovered about an individual through GIS-based manipulations such as geocoding or the combination of two or more databases" (GISCI 2021). GISPs are also required to allow individuals to withhold consent for being added to a database, to correct information about themselves within a database, and to remove themselves from a database. Again, the ASPRS code of ethics does not specifically address such issues.

4. Potential GIS Code of Ethics Conflicts

As noted above, while codes of ethics and rules of conduct provide useful guidelines for ethical professional behavior, they do not address every situation that arises for a GIS professional. These guidelines are not detailed enough, nor can they foresee the future. In fact, DiBiase (2017) notes that GISCI's very first rule of conduct states that "Some applications of GIS… may harm individuals… while advancing government policies that some citizens regard as morally objectionable. GIS professionals' participation in such applications is a matter of individual conscience" (GISCI 2007). So, while the codes of ethics and rules of conduct serve as a "prevention of wrong," it does not provide enough guidance to ensure the "promotion of good" (Bright et al. 2006).

This is where virtue ethics and practical wisdom come into play. Discussions with other members of the GIS profession, including mentors, and colleagues may be helpful to inform decision-making in this scenario. Seeking advice through ASPRS and GISCI may be useful, although neither organization specifically suggests this as an option.

5. Code of Ethics Sanctions

Both ASPRS and GISCI impose sanctions on their certified professionals who violate their code of ethics. One noticeable difference between these organizations is the transparency associated with reporting and imposing sanctions for ethics violations. ASPRS addresses its procedures in Article IX (Committees), Section 7 (Governance Committee), Subsection c (Professional Conduct) of its Bylaws (2019). The Governance Committee is comprised of five former past presidents of ASPRS, with the most recent past president heading the committee (Jordan 2021). Anyone -- even if they are not certified by ASPRS -- can bring legitimate charges against a certified ASPRS professional by filing a formal, written complaint. Complaints and the names of those who file complaints are kept anonymous.

Once a complaint is filed, the ASPRS Governance Committee discusses the charges. If there is no merit, the process ends. If the charges appear to have merit, the Committee presents a copy of the complaint to the person who has been charged. The process continues with further exploration, with the Committee ultimately making a decision. If the committee finds no wrongdoing, the complaint is dropped. If the Committee finds evidence of wrongdoing, the person charged has the right to appeal.

Sanctions for proven ethics violations of the ASPRS Code of Ethics include temporary or

permanent revocation of certification, depending on the severity of the violation. Furthermore, member information will be updated to say that certification has been revoked (Jordan 2021).

The GIS Certification Institute provides extensive information on its website about how to file an ethics complaint against a GISP, the steps in the process, and the potential sanctions. This includes an online complaint form. “Any person, whether a GISP or not, may file an ethics complaint against a GISP” (p. 7). Even before a complaint is filed, a concerned individual may request informal or formal advice from GISCI through its Ethics Communications Officer (GISCI Ethics Manual 2010). If concerns remain, the next step is to file a formal complaint. All complaints must be filed in writing using the form available on the GISP website. If, based on reviews by the Ethics Officer and the Ethics Committee, the GISP is determined to have violated the GISCI Code of Ethics, there are a variety of sanctions that increase in severity depending upon the nature of the violation (GISCI Ethics Manual, p. 4):

- Admonition, a caution or advisory against such activity by the Respondent.
- Private censure through notification of violation to the Respondent and the Complaining Party indicating that one or more rules of conduct have been violated.
- Public censure, which involves distribution of notice to the news media identifying the offender, the nature of the offense, and the seriousness of the sanction.
- Probation may be imposed for a specified time period, during which a subsequent ethics violation may result in the Ethics Committee levying a more severe sanction.
- Suspension of certification; i.e., temporary revocation of the GISP certification
- Termination of certification; i.e., immediate revocation of certification and a permanent bar to being a GISP.

While both ASPRS and GISCI have both had charges filed against one or more of their certified professional, in the interest of confidentiality, neither professional certification was able to provide specific details.

Below is a table comparing ASPRS and GISCI and their codes of ethics.

Table 1. ASPRS and GISCI Comparison with Regards to Ethics Information

	GISCI	ASPRS
Year Established	2004	1934
# of Individuals Certified (as of 2020)	10,800	500
Maintains Code of Ethics	Yes	Yes
Duty to Society	Yes	Yes
Duty to Employer	Yes	Yes
Duty to	Funder	Client
Duty to Colleagues	Colleagues & Profession	Colleagues & Associates
Duty to Individuals in Society	Yes	No
Cases brought?	Yes	Yes
Ethics info on website?	Yes	Yes, but requires search
Link to file charges on website?	Yes	No

	GISCI	ASPRS
Sanctions for ethics violations?	6 sanctions, depending on severity	Suspension or permanent revocation of certification

6. Conclusion

The American Society for Photogrammetry and Remote Sensing (ASPRS) and the GIS Certification Institute (GISCI) have a great deal in common when it comes to ethics for their members. As noted, the two organizations share obligations to the same entities (society, employers, colleagues, the profession). Their codes of ethics also share much in common as well.

Perhaps the biggest contrast between the two organizations is transparency in handling ethics complaints. The ASPRS codes of ethics and procedures for filing ethics complaints are nested within its Bylaws, while GISCI's website includes a clickable "Ethics" heading that provides a wealth of information about the code of ethics, filing ethics complaints, and details about potential sanctions. In spite of these differences, it is clear that both organizations are concerned about the ethical behavior of their members.

While the codes of ethics and rules of conduct provide valuable guidance for professionals certified by ASPRS and GISCI, discussions of virtue ethics and practical wisdom and presentation of relevant material – including case studies -- would also be beneficial.

In addition, DiBiase (2017) has noted that few college-level GIS courses include discussions of professional ethics. As several authors have noted (DiBiase 2017; Harvey 2014; Cinnamon 2020), the Ethics Education for Geographic Information Professionals project provides multiple cases online at gisethics.org.

References

Arjoon, S. (2000). Virtue Theory as a Dynamic Theory of Business. Journal of Business Ethics 28:159-178.

ASPRS (American Society for Photogrammetry and Remote Sensing). 2021. ASPRS Bylaws.

ASPRS. (n.d.) Code of Ethics of the American Society for Photogrammetry and Remote Sensing.

Bright, D. S., Cameron, K. S., and Caza, A. (2006). The amplifying and buffering effects of virtuousness in downsized organizations. Journal of Business Ethics 64:249-269.

Chun, R. (2005). Ethical character and virtue of organizations: an empirical assessment and strategic implications. Journal of Business Ethics 57:269-284.

Cinnamon, J. (2020). Geographic Information Systems: Ethics. International Encyclopedia of Human Geography, 2nd edition, volume 6.

Craig, W. J. (1993). A GIS Code of Ethics: What can we learn from other organizations? Journal of the Urban and Regional Information Systems Association, 5:2, 13-16.

Crampton, J. (1995). The Ethics of GIS. Cartography and Geographic Information Science 22(1):84-89.

Croswell, P. L. (2009). The GIS Management Handbook, 1st Edition. Frankfort, Kentucky: Kessy Dewitt Publications.

Curry, M. R. (1995). Rethinking Rights and Responsibilities in Geographic Information Systems: Beyond the Power of the Image. Cartography and Geographic Information Systems, 22(1), 58-69.

GIS Certification Institute (GISCI). (2010). Ethics Manual, Version 2.1. GIS Certification Institute.

GIS Certification Institute (GISCI). (2021). A GIS Code of Ethics. Accessed January 6, 2021.

Harvey, F. (2014). Values, choices, responsibilities: thinking beyond the scholarly place of ethics for the GIScience and technology profession and GIScience. Journal of Geography in Higher Education, 38(4): 500-510.

Hursthouse, R. (2007). Virtue Ethics. In: Stanford Encyclopedia of Philosophy.

Jordan, T. (2021). Personal communication: Interview via Zoom with Nancy Obermeyer, March 3, 2021.

Linden, D. S. (1991). Comments from the board: ethics and the GIS industry – are the terms contradictory? GIS World, 4 (4):17.

Onsrud, H. J. (1995). Identifying Unethical Conduct in the Use of GIS. Cartography and Geographic Information Systems, 22(1):90-97.

United States Geospatial Intelligence Foundation (USGIF). (n.d.). “Who we are.” Accessed 2021.