

## Chapter 2

# Geoethics: Reenvisioning Applied Philosophy

Ingrid Lemán Stefanovic

*Dean, Faculty of Environment, Simon Fraser University; Professor Emeritus, Department of Philosophy, University of Toronto, Canada*

### Chapter Outline

<b>Part I: The Place of Ethics</b>	<b>16</b>	<b>Part III: A New Role</b>	
<b>Part II: Geoethics, Risk</b>		<b>for Ethicists</b>	<b>21</b>
<b>Assessment, and Environmental</b>		<b>References</b>	<b>22</b>
<b>Decision Making</b>	<b>19</b>		

---

### Abstract

This chapter argues that values—often taken for granted—affect decision making in significant ways within the field of Earth sciences. At the same time, it also suggests that the relationship between ethics and the geosciences is reciprocal: a new role for ethicists emerges from this interdisciplinary conversation, just as new questions arise for geoscientists. I begin by introducing some key philosophical concepts, particularly as they are informed by the growing field of environmental ethics. Part I clarifies some basic philosophical terminologies and explores the role of philosophy as an “applied” discipline. Part II illustrates how different value systems affect scientific judgment calls and decision making, using examples from the fields of geology and risk assessment. Part III argues for a new role for ethics and ethicists that emerges from this interdisciplinary conversation between philosophy and the Earth sciences.

**Keywords:** Applied ethics; Environmental ethics; Philosophy.

---

*Our relationship to the Earth cannot be encompassed by science alone.*

Robert Frodeman, Geo-Logic

## PART I: THE PLACE OF ETHICS

Canada, my home, is internationally recognized as a resource-rich country. From forestry to mining industries, Earth scientists are playing a central role in advancing our understanding of the nature and scope of these environmental resources. Whether exploring water quality and quantity or mapping baseline scientific profiles of our landscapes, the fact is that the geosciences have an important role worldwide to play in the building of information databases and the development of environmental standards. From defining geographical boundaries in discussions of sovereign land rights to identifying new energy sources to assessing risks of environmental hazards, the Earth sciences are also increasingly involved in policy development, environmental planning, and even planetary climate change research and analysis.

In many respects, the Earth sciences emerge, therefore, as a preeminent example of interdisciplinary knowledge. Beyond the parameters of standard lab-based science, researchers are immediately drawn into the complexities of field work, as well as discussions of public policy, economics, and sociocultural matters. In the words of geologist and philosopher, Robert Frodeman, “defying categories, geologic insights today often function simultaneously as scientific statements, political truths, and poetic and metaphysical incantations” (Frodeman, 2003, p. 2).

To be sure, science seeks to empirically measure the availability of water or mineral resources; but what impact will shortages of such resources, here or abroad, have on foreign policy? How long will depleting aquifers sustain local communities and how does one plan longer term for the viability or reorganization of such communities? What is the likelihood of earthquakes or floods in parts of the country, and how does one minimize the risks to society through more informed adaptation and mitigation strategies?

And finally, as issues like these move us from science to the social sciences, the question emerges about what *ought* to be done in specific cases of environmental decision making. That prescriptive, rather than descriptive, moment moves us squarely into the humanities and indeed, into the field of ethics.

There are a number of ways in which one can discuss the role of ethics when it comes to the Earth sciences. To provide some context, let me begin with a *metaethical* discussion, addressing two major concerns. First, I consider how (and why) one might distinguish ethics from morality and why the distinction may or may not be important to the field of geoethics.

Second, I consider a common philosophical distinction between top-down and bottom-up approaches to questions of applied ethics. To take a “top-down” approach means that a general rule or moral principle is applied to a specific case to which the rule applies (Beauchamp, 2005, p. 7). On the other hand, “bottom-up” approaches focus primarily on the specific challenges of discrete, practical decisions. By listening to diverse narratives, “bottom-up” approaches avoid applying prescribed, theoretical principles in advance of a careful listening to the unique circumstances of each case (Beauchamp, 2005, p. 8).

Following that discussion, I want to argue for a more iterative approach between ethics and *praxis*, showing how values, ethical assumptions, and paradigms infuse decision making in the case of the geosciences—and how the geosciences can also influence unique philosophical reflections.

So then, let us begin with the question: how does “ethics” relate to questions of morality? Some believe that the distinction is important, particularly if one seeks to distinguish between “ethics” as a societal set of principles, on the one hand, and, on the other hand, one’s own, personal sense of morality. In some cases, for instance, one’s own *morals* may not coincide with a broader, explicitly articulated professional or *corporate ethic*. Sometimes, there is a sense that “morality” reflects one’s subjective values, whereas “ethics” points to a shared understanding of socially accepted objective rules of conduct.

Nevertheless, for others, the relation between ethics and morality signifies a distinction without a difference. For practical purposes, the terms are seen to overlap, since the field of ethics raises questions of moral principles, and morality is guided by ethical deliberation.

My own sense is that, while there is an important role for professional ethics for Earth scientists, the growing field of “geoethics” itself signifies something larger (Peppoloni and DiCapua, 2012). To be sure, the field certainly invites the possibility of explicitly articulated codes and principles. But the Greek origins of the term *ethos* point to the much broader question of how we dwell virtuously in our social and environmental relationships. In the words of Hans-Georg Gadamer (1900–2002), to raise ethical questions is to reflect on “right living” (Gadamer, 2013, p. 286).

Beyond developing explicit, universally recognized principles or codes of behavior, the field of “geoethics” should also acknowledge the importance of deciphering utilitarian arguments and balancing moral costs and benefits in each discrete case of decision making. And frankly, the description of a new area of study called “geoethics” similarly invites the possibility of exploring and justifying implicit, often hidden moral and ethical—understood synonymously—judgment calls that affect environmental decision making.

In short, while “ethics” and “morality” might be distinguished in certain cases, I would argue that the term “geoethics” indicates, in the broadest possible way, an emerging field of interest that encompasses formalized codes of behavior; diverse processes of moral reflection; and even the possibility of interpreting, analyzing, and justifying taken-for-granted values and assumptions that implicitly underlie and affect decision making in the geosciences as a whole (Frodeman, 2000).

This conversation about the relation between explicitly articulated codes of ethics and broader, sometimes taken-for-granted moral interpretations of our actions and ways of thinking, reflects a parallel differentiation between “top-down” and “bottom-up” philosophical approaches to understanding (Beauchamp, 2005).

On the one hand, some ethicists believe that the task for philosophers is to develop a clear, universally accepted, rational set of theoretical guidelines that can subsequently be “applied” top–down to specific cases of moral controversy. So, for instance, recognizing that the Greek “deon” means “duty,” one may choose to build a *deontological* moral theory, as did Immanuel Kant (1724–1804), whereby rational principles are seen to logically imply specific rights and responsible ways of acting (Kant, 1997, 2009). Or one may develop a *utilitarian* theoretical basis for decision making, explicitly arguing that right actions emerge by seeking “the greatest good for the greatest number” through an assessment of the consequences of a specific decision (Mill, 2007). In both cases, the “top–down” approach suggests that the way in which to “apply” ethics to particular cases of decision making is to clarify a rational set of theoretical guidelines and then put those guidelines into practice.

On the other hand, some point out that ethics can never have the precision of mathematics and that no universal consensus exists about which set of theoretical principles to in fact apply in all cases and unilaterally in a “top–down” fashion. Life is messy, critics argue, and the task for ethicists is to acknowledge this reality and learn from it, informing theory instead by way of a “bottom–up” approach, and on a case-by-case basis. The result is that rather than developing a single, monistic ethical theory that is universally accepted, philosophers should accept that plural theoretical frameworks can inform, and be informed by, a diversity of lived, practical challenges (Stone, 1988; Norton, 2005).

Many arguments in favor of such a “bottom–up” approach to ethical deliberation have emerged from applied fields, such as bioethics or environmental ethics. For example, no matter what kind of ethical principles or guidelines in favor of euthanasia one may argue for in the abstract, the fact is that, sitting at the bedside of a terminally ill patient and deliberately disengaging life support, invites a complexity of emotions, intellectual reasons, and human experiences that are often seen to exceed and be inadequately captured by simplistic theoretical arguments. Similarly in the environmental field, a utilitarian calculus of costs and benefits of building a shopping mall may never capture the full breadth of meaning of the land, held deeply through long tradition by local, indigenous communities. In that respect, ethicists suggest that “top–down” imposition of theoretical guidelines may miss the intricacies of the particular case at hand.

My own sense is that “top–down” application of a single set of theoretical principles is rarely sufficiently sensitive to the vagaries and complexities of decision making. Ethicists simply do not possess a single “how-to” manual because moral deliberation is simply more than a technical matter of unilaterally “applying” conclusively established and universally applicable theories to diverse, complex problems.

At the same time, to say that every practical situation uniquely informs theory “bottom–up” seems to deny the possibility of meaningful core values that may, implicitly or explicitly, guide decision making, despite changing circumstances. In other words, I see the field of ethics both informing and being

informed by the vagaries of unique experiences *as well as* the commonalities of informed, theoretical deliberation. Sometimes, specific cases stretch our theories but, equally, without some form of theoretical reflection, moral decision making remains rudderless and arbitrary.

How does this iterative relation between theory and practice play out in the real world? And how might this conversation impact the growing interest in the field of geoethics? I address these questions in the following section.

## **PART II: GEOETHICS, RISK ASSESSMENT, AND ENVIRONMENTAL DECISION MAKING**

My own approach to the field of ethics emerges from a lifelong interest in phenomenology and hermeneutics (Stefanovic, 2000, 1994). Without detracting from the purposes of this chapter with long-winded philosophical explanations, let me simply say that both the phenomenological and hermeneutic approaches recognize the importance of what Aristotle (384–322 BC) called in Book VI of his *Nicomachean Ethics*, “*phronesis*”—practical wisdom. The aim of the phenomenological method is, in the words of philosopher Martin Heidegger (1889–1976) to “lay bare” elements of lived experience that are so close, and thereby so taken for granted that we forget that they constitute the condition of the possibility of explicit theoretical calculation and deliberative thought (Heidegger, 1962; Stefanovic, 1994, 2000). Hermeneutics, as the art and theory of interpretation of linguistic and nonlinguistic texts, recognizes that understanding is rarely if ever value-free: rather, it emerges from within the background of larger, implicit, prethematic interpretive horizons, and contextual relations.

Phenomenologist and hermeneutic philosopher, Hans-Georg Gadamer explains (2013, p. 563) how:

*In the natural sciences, what are called facts are not arbitrary measurements but measurements that represent an answer to a question, a confirmation or refutation of a hypothesis. So also an experiment to measure certain quantities is not legitimated by the fact that these measurements are made with utmost exactitude, according to all the rules. It achieves legitimacy only through the context of research. Thus all science involves a hermeneutic component.*

All scientific questions, in other words, emerge from within a taken-for-granted interpretive context of lived experience, paradigms, perceptions, and values. The answers that we arrive at in our scientific experiments very much depend upon what kind of questions are asked in the first place, and those questions are determined by larger research priorities and assumptions that exceed the narrow boundaries of the specific scientific experiment. In this connection, the aim of phenomenological ethics, then, is to “lay bare,” to bring to attention and better understand those deeply embedded values that influence the decisions and interpretations that we make about a variety of factors, from how to orient ourselves within our daily lives to how we interpret and assign meaning to specific, scientific findings.

Consider, for instance, how the recent interest in the very term “geoethics” signifies a paradigm shift: while “ethics” has for centuries been interpreted in the Western world exclusively in terms of human and social concerns, “Geoethics” implicitly expands those parameters beyond narrow anthropocentric parameters to include a broader “ecocentric” awareness of the Earth and its nonhuman inhabitants. The value of a geological resource, for instance, in traditional interpretations, would be understood merely in terms of its mined use to human societies; and yet, a nonanthropocentric interpretive context often frames the discussion quite differently in terms of larger ecosystem impacts of mining, or in terms of the sacredness of the landscape for indigenous communities or even its “intrinsic” rather than merely “instrumental” value. The point is that the very language we use betrays hidden value systems and paradigms that frame the meanings that we assign to the external world.

Values and attitudes are taken for granted in other ways as well. Often, Earth scientists participate in risk assessments: burying nuclear waste (Hocke, 2015), for instance, requires understanding of geological conditions and those conditions are often open to interpretation. As philosopher and biologist, Kristin Shrader-Frechette, points out, the “period of interest” in assessing the risk of migration of radioactive waste (often called “radwaste”) can be tens of thousands of years “four orders of magnitude longer than any period of observation” (Shrader-Frechette, 2000, p. 16). Simulation models operate under certain assumptions, based upon incomplete scientific knowledge—which means that value judgments are made in order to both evaluate risks as well as to frame the models’ parameters. Because of these unknowns, a “serious difficulty with hydrogeological models is that scientists often do not agree on what would confirm them” (Shrader-Frechette, 2000, p. 18).

Of course, to recognize that models are not value-free does not imply that we should reject them. On the contrary, it is precisely because judgments are incorporated within the models that we are obliged to (1) explicate values and attitudes that may influence research parameters, (2) model from as large a variety of perspectives as possible, and (3) ensure that public discussion and transparency guide the decision-making process when it comes to controversial issues such as burying radwaste (Shrader-Frechette, 2000).

Similarly, ethical issues infuse a variety of other geological problems, such as those that arise through cases of acid mine drainage—contamination arising from abandoned mines. *Ought* those mines be restored and if so, to what level of safety? And who should rightly bear the costs of such restoration? (Frodeman, 2003, p. 20). Robert Frodeman (2003, p. 20). points out how philosophy’s role in these conversations is broad and varied, and includes “ethical, aesthetic, epistemological, metaphysical and theological dimensions that...are more central to our concerns with the environment than we often acknowledge”.

A final example: consider the problem of identifying an appropriate site for landfill disposal. It is clear that here, geological factors are clearly crucial but a number of ethical issues are imbedded in the siting decision as well. On the one hand, a utilitarian calculus may well favor a particular location, if estimates

show that benefits outweigh costs. On the other hand, a cost–benefit analysis that apparently maximizes the overall good may not be the end of the story. For instance, questions of environmental justice often arise, since it has been shown that toxic waste sites are disproportionately located in neighborhoods where low-income and/or nonwhite populations reside (Wenz, 1988). In that case, deontological priorities such as basic human rights, duties, and principles of fairness may be seen to legitimately override cost–benefit calculations.

In each of these cases and many more that are documented in this book, ethical issues arise within cases of environmental decision making and deserve attention by geoscientists. If we are drawn to such a conclusion, the next question is: what is the role of geoethicists in this conversation? I address this issue in the following section.

### **PART III: A NEW ROLE FOR ETHICISTS**

In his groundbreaking (no pun intended!) book, entitled *Geo-Logic*, Robert Frodeman suggests at least two roles for philosophers.

The first is to “provide an account of the specifically philosophical aspects of our environmental problems,” encompassing questions that range from the moral to the aesthetic (Frodeman, 2003, p. 20). My sense is that providing such an account means more than simply applying theory to practical problems; instead, just as much as philosophers can contribute to understanding moral problems that arise within the geosciences, those very problems invite philosophers to ask different kinds of questions themselves. In other words, the interdisciplinary conversation is two-way, requiring that scientists incorporate philosophical reflection into their work and that philosophers inform their reflections through genuine engagement with the geosciences.

The second role for philosophers described by Frodeman (2003, p. 20) is to “offer a synopsis of how the various disciplines relate within a given problem”. Encouraging interdisciplinary dialogue, philosophers have a responsibility to do more than simply engage in conversations among themselves but instead, to step into a different kind of collaboration that investigates relationships between the disciplines, engages in *praxis*, and redefines the meaning of “applied ethics.”

To use the words of German philosopher, Jürgen Habermas (1929–present), the role for philosophers and ethicists is less to stand back and fashion speculative theory than to serve as “stand-in interpreters,” assisting communities to identify, critically analyze, and justify value claims and norms as they relate to environmental decision making (Habermas, 1990). What are a community’s core values? Which values are negotiable? Which are peripheral to the conversation? Those kinds of questions are best addressed by ethicists who seek to “apply” their discipline in a responsible manner, in a diversity of ways (Morito, 2010). Complex problems require both the interpretation of different standpoints, as well as negotiation among competing interests. Deciding what is the

“right” or “fair” thing to do in such cases of competing interests, only benefits from the input of ethicists.

In that sense, philosophy and ethics are much more than merely of academic concern. If the field of geoethics is to do justice to both the findings of the Earth sciences as well as to a new vision of what constitutes genuine philosophical reflection, then ethicists themselves have to engage in different kinds of conversations. They need to speak less among themselves and more to the broader community as a whole. They need to learn to translate their discipline-based terminology to different audiences, in order to effectively impact upon the way in which our world is evolving. They need to do what Aristotle advocated, that is, insert themselves firmly into the lived center of the “agora”—the meeting place where practical decisions are actually made, rather than simply contemplated. In the process, philosophy will be transformed into a more meaningful discipline, just as it transforms the geosciences by inviting them to join in ethical reflection.

The field of geoethics is new and growing. As we move forward, the challenge is to find ways in which to engage in this interdisciplinary conversation in such a way that ethics informs science, as much as science informs philosophical practice. Only then are both the fields of geology and philosophy enhanced and strengthened.

## REFERENCES

- Beauchamp, T., 2005. The nature of applied ethics. In: Frey, R.G., Wellman, C.H. (Eds.), *A Companion to Applied Ethics*. Blackwell Publishing Ltd, Malden, MA, pp. 1–16.
- Frodeman, R. (Ed.), 2000. *Earth Matters: The Earth Sciences, Philosophy and the Claims of Community*. Prentice Hall, Upper Saddle River, NJ.
- Frodeman, R., 2003. *Geo-logic: Breaking Ground between Philosophy and the Earth Sciences*. State University of New York Press, Albany.
- Gadamer, H.G., 2013. *Truth and Method*. Bloomsbury Academic, London.
- Habermas, J., 1990. *Moral Consciousness and Communicative Action: Reason and the Rationalization of Society* (T. McCarthy, Trans.). Beacon Press, Boston.
- Heidegger, M., 1962. *Being and Time* (J. Macquarrie and E. Robinson, Trans.). Harper and Row, New York.
- Hocke, P., 2015. Nuclear waste repositories and ethical challenges. In: Wyss, M., Peppoloni, S. (Eds.), *Geoethics: Ethical Challenges and Case Studies in Earth Science*. Elsevier, Waltham, Massachusetts, pp. 359–367.
- Kant, I., 1997. *Critique of Practical Reason* (M.J. Gregor, Trans.). Cambridge University Press, New York.
- Kant, I., 2009. *Groundwork of the Metaphysics of Morals* (H.J. Paton, Trans.). Harper Collins, New York. First published in 1948.
- Mill, J.S., 2007. *Utilitarianism*. Dover Publications Inc., London. First published in 1871.
- Morito, B., 2010. Ethics of climate change: adopting an empirical approach to moral concern. *Hum. Ecol. Rev.* 17 (20), 106–116.
- Norton, B.G., 2005. Values in nature: a pluralistic approach. In: Cohen, A.I., Wellman, C.H. (Eds.), *Contemporary Debates in Applied Ethics*. Blackwell Publishing Ltd, Malden, MA.



- Peppoloni, S., DiCapua, G. (Eds.), 2012. Geoethics and Geological Culture. Reflections from the Geoitalia Conference 2011. *Annals of Geophysics*, vol. 55, No. 3 at: <http://www.annalsofgeophysics.eu/index.php/annals/issue/view/482>. accessed 02.04.14.
- Shrader-Frechette, K., 2000. Reading the riddle of nuclear waste. In: Frodeman, R. (Ed.), *Earth Matters: The Earth Sciences, Philosophy and the Claims of Community*. Prentice Hall, Upper Saddle River, NJ, pp. 11–24.
- Stefanovic, I.L., 2000. Safeguarding Our Common Future: Rethinking Sustainable Development. State University of New York Press, Albany, NJ.
- Stefanovic, I.L., Spring 1994. What is phenomenology? In: *Brock Review*, vol. 3, No. 1, pp. 57–77.
- Stone, C., 1988. *Earth and Other Ethics: The Case for Moral Pluralism*. Harper Collins, New York.
- Wenz, P., 1988. *Environmental Justice*. State University of New York Press, Albany.