**Semester Course on Public Deliberation about Gene Editing in the Wild**

**Course Description**

Emerging technologies for the genetic modification of organisms present unprecedented opportunities to alter wild populations of organisms, from microbes to mammals, and consequently to change interspecies dynamics and reshape ecosystems. With these opportunities come perplexing governance challenges. Most commentators maintain that decision-making about whether, when, and how to use these technologies should include public engagement activities through which the public can learn about the science, researchers and their funders can learn about the public’s values, and final decisions can be shaped by a range of inputs. In its strongest form, the argument for public engagement holds that proceeding with a proposal to modify a wild population requires the public’s authorization. In this course syllabus, we discuss how to draw on interdisciplinary scholarship in bioethics, political science, and public administration to teach a class or deliver individual lectures that explore this knot of conceptual, normative, and practical problems. We review several key issues and questions. What is gene editing in the wild? What are the ethical and political questions raised by these technologies? When is broad public deliberation about gene editing in the wild necessary? And when it is required, how should it be done? These questions lead to a suite of further questions about, for example, the rationale and goals of deliberation, the features of these technologies that make public deliberation appropriate or inappropriate, the criteria by which “stakeholders” and “relevant publics” for these uses might be identified, how different approaches to public deliberation map onto the challenges posed by the technologies, how the topic to be deliberated upon should be framed, and how the outcomes of public deliberation can be meaningfully connected to policy-making.

**Course Learning Objectives**

By the end of this course, you will be able to

(1) Define gene editing in the wild

(2) Identify the values questions raised by attempts to genetically modify the shared environment

(2) Assess the value of using public deliberation to address gene editing in the wild

(3) Explain and assess the factors that can influence the success of a public deliberation about gene editing in the wild

**Detailed Class Schedule and Readings**

**Session 1: Introduction: Overview of Gene Editing in the Wild**

*Objectives: Explain what gene editing in the wild involves; identify the values choices raised by gene editing in the wild technologies; assess the value of public deliberation about gene editing in the wild*

Barnhill-Dilling, S. Kathleen, Adam Kokotovich, and Jason A. Delborne, “The Decision Phases Framework for Public Engagement: Engaging Stakeholders about Gene Editing in the Wild,” in *Gene Editing in the Wild: Shaping Decisions through Broad Public Deliberation*, ed. Michael K. Gusmano et al., *Hastings Center Report* 51, no. 2 supplement (2021): S48–S61. DOI: 10.1002/hast.1320

Gusmano, Michael K., Kaebnick, Gregory E., Maschke, Karen J., Neuhaus, Carolyn P., and Wills, Ben Curran, “Public Deliberation about Gene Editing in the Wild,” in *Gene Editing in the Wild: Shaping Decisions through Broad Public Deliberation*, ed. Michael K. Gusmano et al., *Hastings Center Report* 51, no. 2 supplement (2021): S2–S10. DOI: [10.1002/hast.1314](https://doi.org/10.1002/hast.1314)

Kaebnick, Gregory E., “Does Gene Editing in the Wild Require Broad Public Deliberation?,” in *Gene Editing in the Wild: Shaping Decisions through Broad Public Deliberation*, ed. Michael K. Gusmano et al., *Hastings Center Report* 51, no. 2 supplement (2021): S34–S41. DOI: 10.1002/hast.1318

**Session 2: Values and the Shared Environment**

*Objectives: Identify the values that may be at stake when considering changes to the shared environment; assess strategies for balancing conflicting values*

Kaebnick, Gregory E. and Gusmano, Michael K., “CBA and Precaution: Policy-Making about Emerging Technologies,” in *Governance of Emerging Technologies: Aligning Policy Analysis with the Public's Values*, ed. Gregory E. Kaebnick et al., *Hastings Center Report* 48, no. 1 supplement (2018): S88–S96. DOI: 10.1002/hast.824

Larrère, Catherine, "Environmental ethics: Respect and responsibility," *Rethinking Nature*. Routledge, (2017), 15–26.

[Wilbanks,](https://onlinelibrary.wiley.com/doi/10.1002/hast.1315) [[Rebecca](https://onlinelibrary.wiley.com/doi/10.1002/hast.1315)](https://onlinelibrary.wiley.com/action/doSearch?ContribAuthorRaw=Wilbanks%2C+Rebecca)[, “Genetic Control in Historical Perspective: The Legacy of India's Genetic Control of Mosquitoes Unit,” in](https://onlinelibrary.wiley.com/doi/10.1002/hast.1315) *[Gene Editing in the Wild: Shaping Decisions through Broad Public Deliberation](https://onlinelibrary.wiley.com/doi/10.1002/hast.1315)*[, ed. Michael K. Gusmano et al.,](https://onlinelibrary.wiley.com/doi/10.1002/hast.1315) *[Hastings Center Report](https://onlinelibrary.wiley.com/doi/10.1002/hast.1315)*(2021): 51, no. 2 supplement: S11–S18.

**Session 3: Adversarial, Participatory, and Deliberative Democracy**

*Objectives: Describe and explain the differences among adversarial, participatory, and deliberative democracy*

Mansbridge, Jane, “Does Participation Make Better Citizens?” *The Good Society* 5, no. 2 (1995): 4–7.

Pateman, Carole, “Participatory Democracy Revisited,” *Perspectives on Politics* 10, no. 1 (2012): 7–19.

Curato, Nicole; John S. Dryzek, Selen A. Ercan, Carolyn M. Hendriks, and Simon Niemeyer. “Twelve Key Findings in Deliberative Democracy Research,” *Deadalus* 146, no. 3 (2017): 28–35.

**Session 4: Democratic Deliberation**

*Objectives: Articulate the political philosophical bases for public deliberation*

Habermas, Jürgen, “Three Normative Models of Democracy,” *Constellations* 1, no. 1 (1994): 1–10.

Chambers, Simone, “The Philosophic Origins of Deliberative Ideals,” in *The Oxford Handbook of Deliberative Democracy*, ed. André Bächtiger, John S. Dryzek, Jane Mansbridge, and Mark E. Warren, Oxford: Oxford University Press, 2018.

Mansbridge, Jane, et al., “A Systemic Approach to Deliberative Democracy,” in *Deliberative Systems: Deliberative Democracy at the Large Scale,* ed. John Parkinson and Jane Mansbridge,Cambridge: Cambridge University Press, 2012.

**Session 5: Types of Public Deliberation**

*Objectives: Identify and assess different approaches to broad public deliberation*

Delli Carpini, Michael X., Fay Lomax Cook, and Lawrence R. Jacobs, “Public Deliberation, Discursive Participation, and Citizen Engagement: A Review of the Empirical Literature,” *Annual Review of Political Science* 7 (2004): 315–44.

Mitton, C., N. Smith, S. Peacock, B. Evoy, and J. Abelson, “Public Participation in Health Care Priority Setting: A Scoping Review, *Health Policy* 91, no. 3 (2009): 219–28.

Rowe, G., and L. Frewer, “A Typology of Public Engagement Mechanisms,” *Science Technology Human Values* 30, no. 2 (2005): 251–90.

**Session 6: De-extinction Cases: the Passenger Pigeon The American Chestnut and**

*Objectives: Evaluate the role of public deliberation in real world cases*

*The Hastings Center Public Deliberation on Gene Editing in the Wild Cases:*

1. *The American chestnut*
2. *“De-extinction” of the passenger pigeon*

***Session 7: Midterm Exam***

**Session 8: Public Deliberation and Representation**

*Objective: Evaluate the criteria by which “stakeholders” and “relevant publics” are identified for broad public deliberation*

Fishkin, James S., “Deliberative Public Consultation via Deliberative Polling: Criteria and Methods,” in *Gene Editing in the Wild: Shaping Decisions through Broad Public Deliberation*, ed. Michael K. Gusmano et al., *Hastings Center Report* 51, no. 2 supplement (2021): S19–S24. DOI: 10.1002/hast.1316.

Kofler, Natalie, and Colleen M. Grogan, “Giving Voice to the Voiceless in Environmental Gene Editing,” in *Gene Editing in the Wild: Shaping Decisions through Broad Public Deliberation*, ed. Michael K. Gusmano et al., *Hastings Center Report* 51, no. 2 supplement (2021): S66–S73. DOI: 10.1002/hast.1322.

Taitingfong, Riley, and Anika Ullah, “Empowering Indigenous Knowledge in Deliberations on Gene Editing in the Wild,” in *Gene Editing in the Wild: Shaping Decisions through Broad Public Deliberation*, ed. Michael K. Gusmano et al., *Hastings Center Report* 51, no. 2 supplement (2021): S74–S84. DOI: 10.1002/hast.1323.

**Session 9: Climate Change Cases: Coral and CO2**

*Objectives: Evaluate the role of public deliberation in real world cases*

*The Hastings Center Public Deliberation on Gene Editing in the Wild Cases:*

1. *Warm temperature-tolerant coral*
2. *Phytoplankton or other plants modified to pull CO2 out of the atmosphere*

**Session 10: Public Deliberation and the Role of Narrative**

*Objectives: Explain the role of narratives in public deliberation; evaluate the potential benefits and dangers associated with the use of narrative in deliberation*

Chen, Kaiping, and Michael M. Burgess, “Narratives in Public Deliberation: Empowering Gene Editing Debate with Storytelling,” in *Gene Editing in the Wild: Shaping Decisions through Broad Public Deliberation*, ed. Michael K. Gusmano et al., *Hastings Center Report* 51, no. 2 supplement (2021): S85–S91. DOI: 10.1002/hast.1324.

Wills, Ben Curran, Michael K. Gusmano, and Mark Schlesinger, “Envisioning Complex Futures: Collective Narratives and Reasoning in Deliberations over Gene Editing in the Wild,” in *Gene Editing in the Wild: Shaping Decisions through Broad Public Deliberation*, ed. Michael K. Gusmano et al., *Hastings Center Report* 51, no. 2 supplement (2021): S92–S100. DOI: 10.1002/hast.1325

**Session 11: Public Health Cases: Genetic Modification of Mosquitos**

*Objectives: Evaluate the role of public deliberation in real world cases*

*The Hastings Center Public Deliberation on Gene Editing in the Wild Cases:*

1. *Oxitec mosquito*
2. *Gene drive to reduce populations of malaria-carrying mosquitos*

**Session 12: Public Deliberation and Regulatory Policy Making**

*Objectives: Explain how the outcomes of public deliberation can be meaningfully connected to policy-making*

Kuzma, Jennifer, “Deficits of Public Deliberation in U.S. Oversight for Gene Edited Organisms,” in *Gene Editing in the Wild: Shaping Decisions through Broad Public Deliberation*, ed. Michael K. Gusmano et al., *Hastings Center Report* 51, no. 2 supplement (2021): S25–S33. DOI: 10.1002/hast.1317.

Maschke, Karen J. and Michael K. Gusmano, “Regulating Gene Editing in the Wild: Building Regulatory Capacity to Incorporate Deliberative Democracy,” in *Gene Editing in the Wild: Shaping Decisions through Broad Public Deliberation*, ed. Michael K. Gusmano et al., *Hastings Center Report* 51, no. 2 supplement (2021): S42–S47. DOI: 10.1002/hast.1319.

Williams, Teshanee, “Restructuring Deliberation Using a Cultural Theory Lens,” in *Gene Editing in the Wild: Shaping Decisions through Broad Public Deliberation*, ed. Michael K. Gusmano et al., *Hastings Center Report* 51, no. 2 supplement (2021): S62–S65. DOI: 10.1002/hast.1321.

**Session 13: Genetic Modification of Animals: Vertebrates, Mice, and Moths**

*Objectives: Evaluate the role of public deliberation in real world cases*

*The Hastings Center Public Deliberation on Gene Editing in the Wild Cases:*

1. *Use of a daisy drive to control invasive vertebrates in New Zealand*
2. *Non-native island mice*

**Session 14: Genetic Modification of Plans**

*Objectives: Evaluate the role of public deliberation in real world cases*

*The Hastings Center Public Deliberation on Gene Editing in the Wild Cases:*

1. *The glowing A. thalania*
2. *Control of Palmer amaranth (pigweed)*

***Final Exam***