Bombshelltoe Policy x Arts Collective

ATOMIC TERRAIN

CONVERSATIONS

2023 - 2024

Bombshelltoe Policy x Arts Collective

Bombshelltoe Policy x Arts Collective incubates and presents creative research projects around nuclear disarmament, nonproliferation, and arms control that speaks to everyday people and aligns with their political and cultural views.

It brings nuclear policy experts and artists together to present nuclear-related topics through insightful and beautiful modes of art and narrative. By combining nuclear expertise and artistic expression, Bombshelltoe helps non-nuclear experts find entry points into the nuclear policy discussion.

Learn more: www.bombshelltoe.com

In the summer of 2023, a group of scientists made a monumental announcement about the Earth's slow unfolding history.

They had just proposed what will represent the *Anthropocene*, the current geological timeframe aptly named after the profound and irrevocable impact of humankind on the planet. To formalize this period, they examined places that contained unique geochemical properties — potent traces of dust, plastics, fly ash and other pollutants produced by human activity — that could serve as the Anthropocene's official timestamp. After looking at a dozen sites, from bleached coral reefs to thinning Antarctic glaciers, the scientists agreed on one location: a deep meromictic lake in the southernmost region of Canada (*Kionywarihwaen* in Wendat First Nations language; also known as Crawford Lake), with shimmering waters surrounded by limestone cliffs and cedar pines.[1] Sediments found on the lakebed tell a story of a drastically altered landscape over the course of centuries. Out of the multitude of materials embedded in the sediment, one man-made element stands out: substantial presence of plutonium, originating from the flurry of nuclear weapons tests conducted between the 1940s through the 60s.[2]

To assign the definitive marker of the Anthropocene to a lake laced with radioactive fallout underscores the ways in which the nuclear age disrupted and redefined life on this planet.

1 - The surface and deep water layers of a meromictic lake do not mix, preserving unique properties and environments within these layers.
2- Between 1945 through 1963, 601 tests were conducted by the United States, Russia, Britain, and France. Nuclear weapons tests, especially atmospheric detonations, peaked in 1962 and drastically decreased in 1963 upon the ratification of the Limited Test Ban Treaty, which prohibited all test detonations of nuclear weapons except for those conducted underground. This spike and drop-off are reflected in the radionuclides found in the lake's core samples. For more information about the number of nuclear tests conducted worldwide, please see: https://www.armscontrol.org/factsheets/nucleartesttally
3 - Atomic Terrain is inspired by Bombshelltoe's earlier project "Ways of Knowing" focused on uranium mining in Navajoland, as well as other interdisciplinary projects such as Feral Atlas and the Anthropocene Curriculum that examine the impact of nuclear technologies / infrastructure on the greater environment.

The lake, while geologically special, is far from being the only place tainted by the atom bomb. There are countless landscapes — steppes, plateaus, atolls — around the world that have been and continue to be destroyed, contaminated, and occupied in the process of developing and maintaining nuclear weapons. But the bond between nuclear weapons and the environment not only manifests in radioactive locales. It is embedded in our collective imagination; the idea of nuclear apocalypse naturally conjures visions of a charred, uninhabitable Earth. And lest we forget, nuclear phenomena is an intrinsic part of the natural world. Radioactivity is ever-present in the Earth's crust, a process inherent in our own bodies.

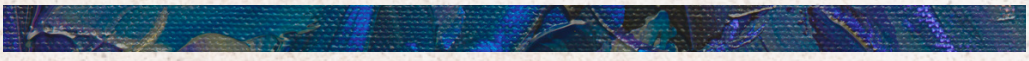
Yet, knowledge and policies produced around and about these two issues remain far apart. When they are mentioned side by side in activist or policy discourse, it is often in the context of competition — is nuclear threat more urgent than climate change, or vice versa? Which should receive financial and public attention, given that both are finite resources? — or to critique the insufficient response in redressing environmental harms from nuclear weapons-related activities. As anxieties about the climate crisis grow and as more people condemn the world's reliance on fossil-fuels, a different association between the nuclear and the environmental has risen to the fore: nuclear power for environmental good. But nuclear power is bedeviled by distrust and fear rooted in histories of accidents and the intractable problems associated with storing nuclear waste.

The nuclear policy and environmental policy constituencies are so rich and varied with intersecting viewpoints and practices, but a chasm exists between them. **A sincere attempt to make sense of these complex entanglements — bombs, science, ecologies, health, politics — requires an expansive set of expertise that do not neatly fit the current construct of what nuclear policy and environmental work should be.** Instead, it must entail humility and imagination: the ability to know the limits and gaps of one's knowledge, confront points of disagreement and tension, while remaining open to finding common ground.

This is the spirit of Atomic Terrain —

a network of individuals representing nuclear policy, environmental / ecology studies, health sciences, anthropology, and artistic disciplines who share knowledge and ideas to bring nuclear policy and environmental stewardship closer together. Atomic Terrain offers a model of collaboration where people can share resources, skills, pedagogies, activism strategies, and policy expertise, all done with mutual respect, eagerness for experimentation, and a desire to protect the world.

CORE QUESTION



To activate this network, Atomic Terrain hosted a series of creative workshops (June - July 2023) and policy roundtable meetings (July - September 2023) among selected individuals representing creative, environmental, anthropology, and nuclear policy fields. Participants considered a broad opening question:

How can we create scholarship frameworks and systems of support to better connect nuclear policy and environmentalism?

The intention is not to answer this question comprehensively, as it is impossible to do so. Rather, it is an invitation to wander into open terrain together — to stumble into intellectual roadblocks, but also find new paths of understanding and collaboration. Atomic Terrain believes that a meaningful intersectional approach to nuclear policy and environmentalism should forge kinship (respecting and appreciating each other's expertise despite disagreements), rather than partaking in transactional or extractive research.

The following pages feature insights from Atomic Terrain participants during one-on-one conversations, as well Atomic Terrain creative workshops and roundtable meetings in response to the question above. Select quotes from Atomic Terrain participants have been edited and condensed for clarity. When appropriate, additional readings have been included for further exploration.

4 - The term "nuclear policy" is broadly defined, encompassing work that contributes to nuclear arms control, nonproliferation, and disarmament. The "nuclear policy field" is the community of scholars, activists, and policy practitioners engaged in this work. "Environmentalism" is defined as efforts to protect the Earth, especially from human activity. Hence, the definition encompasses the study of environmental history, environmental science, and ecology. In several areas of discussion, Atomic Terrain specifically draws from the science of ecology — the study of relationships among organisms and their environments — to understand how individual organisms and species (including humans) interact with one another at a systems level, which is a helpful model to compare to that of international relations. This is not the first time ecology and international relations were brought together; for more information, please see: Clemens, Walter C. "Ecology and International Relations." International Journal 28, No. 1 (1972): 1–27. https://doi.org/10.2307/40201090.

5 - "Extractive" research is used to describe academic conduct that takes knowledge from different fields of study/communities (often in marginalized or "under-researched" communities) without considering proper context, engagement, and experience. Many Indigenous communities affected by nuclear legacies have encountered extractive research practices when engaging in nuclear policy issues, including atomic tourism. For more on extractive research, please see: Gaudry, Adam J.P. "Insurgent Research." Wicazo Sa Review 26, no. 1 (2011): 113–36. https://doi.org/10.5749/wicazosareview.26.1.0113.

6 - Indigenous scholars who have articulated kinship and relationality as essential aspects of research include Linda Tuhiwai Smith; Kyle White; Leslie Marmon Silko ; Shawn Wilson ; among others.

2023 - 2024 PARTICIPANTS

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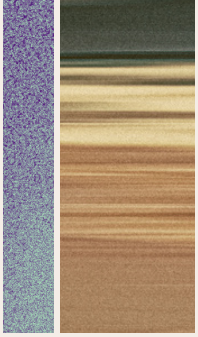


INITIAL IMPRESSIONS: "SECURITY"

Atomic Terrain participants shared several definitions of "security" in the context of nuclear policy (preventing the spread of nuclear weapons and reducing the risk of nuclear conflict), as well as environmental studies (protecting living organisms, their relationship with each other, and their habitats from threats).

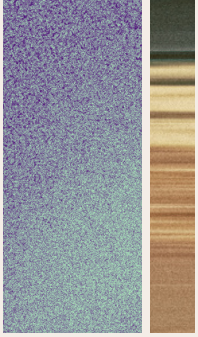
These interpretations do not neatly line up, and in some cases are in direct opposition of each other (e.g., achieving nuclear policy through militarization, which then contributes to more environmental harms), revealing just how much "security" can be socially constructed, reflecting the values, politics, and priorities of a specific constituency and their approach to kno through militarization, which then contributes to more environmental harms), revealing just how much "security" can be socially constructed, reflecting the values, politics, and priorities of a specific constituency and their approach to knowledge.wledge. A given definition orients everything else — the framing of the threat, the available set of options and resources to respond to it — which ultimately influences what is considered an effective course of action or solution.

McDonald, Matt. Ecological Security: Climate Change and the Construction of Security. Cambridge: Cambridge University Press, (2021). https://doi:10.1017/9781009024495.

Identifying misalignments in the varied meanings of "security" is a useful exercise in interrogating commonly-held assumptions about who or what is being secured; who or what constitutes a threat; and the means of achieving a sense of security. While it is impossible to agree on a singular definition that perfectly harmonizes the goals of nuclear policy and environmentalism, there is great value in recognizing points of friction, and in this process, locating openings for mutual understanding and negotiation.

We considered other terminologies adjacent to security such as "safety," and how might "stewardship," "protection," and "care" — expressions common in environmental discourse — can be included in nuclear policy work. This raised questions whether it is possible to borrow from the holistic approach in ecology to better acknowledge the impact of nuclear weapons beyond the nation-state, and connect it to larger systems encompassing non-human interests and the biosphere.

Odum, Eugene P. The Emergence of Ecology as a New Integrative Discipline. Science. 195,1289-1293, (1977). https//doi:10.1126/science.195.4284.1289.

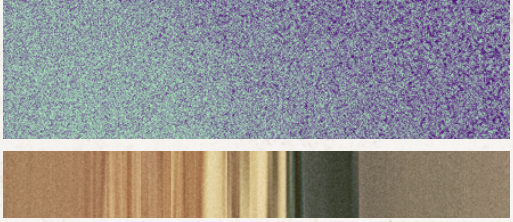


Doing so requires a different way of understanding the concept of hierarchies where units are *nested and intertwined,* rather than *ranked* to appreciate the flow or interconnectedness of life (i.e., communities and ecologies are equally important as they are part of the larger whole).

Ecology and nuclear weapons already share a unique, if not fraught connection through the founding of radioecology, a subfield within ecology that examines the impact of radiation on the environment. Primarily funded by the U.S. Atomic Energy Commission during its inception in the 1950s, radioecology as a discipline prioritized human health above all other life forms. It focused on models that tracked how contamination traveled through the environment, rather than the impact on the environment itself. Revisiting this connection today, is it then possible to rework it such that the goals are less anthropocentric, and find intrinsic value in the natural world?

Hinton, Thomas. "On the Evolution of Radioecology -- and Why We Lost Ecology Along the Way" Powerpoint slides. Institute of Environmental Radioactivity Fukushima University Japan.

Rothschild, Rachel. "Environmental Awareness in the Atomic Age: Radioecologists and Nuclear Technology." Historical Studies in the Natural Sciences 43, no. 4 (2013): 492–530. https://doi.org/10.1525/hsns.2013.43.4.492.



“[Within the nuclear policy field] we make distinctions between security and safety. I understand security as an active attempt to protect a country from very discreet, largely external threats. Safety refers to the protection from not only external threats, but also internal and inadvertent situations like accidents, or miscalculations that aren't necessarily from an external aggressor. When we share all of this outside the nuclear policy field, the default term is “security” since so much of nuclear weapons policy revolves around deterring [other countries]... by focusing on security rather than safety or other alternative terminologies, perhaps we miss the possibility that nuclear catastrophe could come from actions at home, or situations that cannot be deterred in a traditional sense.”

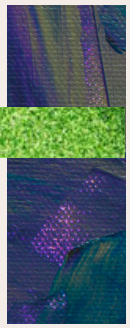
> “[As a non-nuclear expert] it is really interesting to hear these distinctions in jargon. Is it done intentionally? Framing security exclusively to address an outside force is not a holistic picture of conflict, especially concerning the creation of nuclear weapons. There is no room to think about and address the health of the people and land where [these facilities] are situated.”

“As a public health researcher, I've often thought of security in simpler terms: the right to health and wellbeing. Working closely with the nuclear policy community now, there is little consideration for health and wellbeing, given that countries have bombed their own peoples to achieve nuclear capability in the name of national security.”

> “The nuclear policy field currently does not encompass the elements of care and protection...what does it mean to integrate this into the field? Part of the problem is scope: at the international level, the experiences of individuals are not prioritized, making them invisible. It doesn’t necessarily mean the field has to radically change its focus, but rather expand to allow for [other expressions of] security that includes human beings and ecologies, not just governments.

“The way in which nuclear engineers think about [security] is primarily from the standpoint of the systems they design and the material in those systems. So the question becomes: is the nuclear material secure? Is the system secure or safe? It's a very technocentric way of thinking about what safety and security means, which is disconnected from the realities of people and places that live near these systems or sites.”

INTERPLAY OF SPACE TIME KNOWLEDGE



SPACE

HOW SHOULD WE VIEW THE WORLD WE ARE TRYING TO SECURE?

While different frameworks can be applied to the study of nuclear weapons, it is predominantly viewed from a systems level of analysis: relationships among countries and how the absence or acquisition of nuclear weapons capabilities change power dynamics within the global order. Spatial dimension through this level of analysis is narrow and flat, such that only the "national" or "international" exist as monolithic spaces frozen in time. Traditional tools and practices common in the nuclear policy field can inadvertently reinforce this flattening: tabletop exercises and war games often feature abstracted spaces that use government profiles as signifiers (e.g., Country A with traits of American, Russian, or other real world governments). When geographic elements are considered, it is often in context of utility or service to governmental or military objectives. Imagery from aerial surveys and other mapping exercises for military means also provide a flat perspective; rather than presenting a given space, say a desert area, with ecological vibrance, it is seen as empty from up above. This perceived emptiness has historically justified actions under "national" or "international" interests, may that be uranium mining, or nuclear testing. This leaves little room to understand space outside the construct of nation-states or geopolitics.

Agnew, John. "Still Trapped in Territory?" Geopolitics. 15:4, (2010): 779-784, https://doi:10.1080/14650041003717558.

Lambach, Daniel. "Space, Scale, and Global Politics: Towards a Critical Approach to Space in International Relations." Review of International Studies 48, no. 2 (2022): 282–300.https://doi:10.1017/S026021052100036X.

Taking inspiration from disciplines like ecology or anthropology, it may be useful for the nuclear policy field to also think about space in context of landscapes (spaces made up of interrelated ecosystems) and places (spaces that embody culture, constructs, and identities). This would allow "zooming in" on spaces that are typically invisible at the systems level of analysis, including military landscapes — geographies that have been touched by militarism abroad and at home. For nuclear policy, this could include exploring the environmental and social dimensions of former and active nuclear sites, specifically the ways in which humans, through military activity, have come to control and transform a given space. Through this framework, one can begin to appreciate land as a central character or a unit of analysis, rather than a backdrop of conflict.

Woodward, Rachel. Military Geographies Malden, Mass.: Blackwell Publishing (2004).

TIME

HOW DOES NUCLEAR THINKING MOVE THROUGH TIME?

Nuclear policy operates across many temporal scales that are difficult to comprehend all at once. Depending on the focus of work, nuclear weapons issues can be framed as imminent and urgent: nuclear weapons are necessary to deter *future* action; the world is at the brink of nuclear conflict, so nuclear weapons must be controlled or eliminated *now*). It can also be slow and incremental: nuclear modernization plans take decades to complete; nuclear contamination has already happened, and will continue to happen in Indigenous lands, affecting environmental and public health for generations; and decontamination can be equally slow, even stalled depending on availability of technology / political will. External timelines also affect how nuclear policies are studied and developed: presidential cycles, grant deadlines, technological improvements, fiscal year planning, and other factors can accelerate or impede the ability to consider alternative temporalities. Moreover, there are no "quick fixes" in nuclear policy; finding and implementing solutions within the nuclear policy field (e.g., has enough political will, is technologically feasible, etc.) can be frustratingly slow, despite the framing of urgency. There is no right way to conceptualize time, but it is important to be mindful of how nuclear p work maps onto an environmental timeline that spans generations (deep time), and how "slow violence" or delayed destruction caused by radioactivity and toxicity can be easily overshadowed by time-bound national or geopolitical interests.

Nixon, Rob. Slow Violence and the Environmentalism of the Poor. Cambridge, Massachusetts, Harvard University Press. (2011).

One way to break free from a myopic vision of time focused on the present moment is to pursue projects that transcend traditional timelines that view world problems exclusively as contemporary crises, and assume that the current (inter)national institutions are best positioned to represent people in the future. This could take the form of programs, policies, and technologies designed with long-term environmental collectivism and sustainability in mind, including off-ramps such that future generations can modify or dismantle if they no longer serve needs and interests. Governance models that include intergenerational input are already gaining support, particularly calls for global, intergenerational institutions to tackle climate change. This approach is more radical and challenging to implement on foreign policy, let alone nuclear policy given the fundamental incompatibility of environmental time and political time, but academics, artists, and non-governmental institutions are best positioned to experiment possibilities.

Bjornerud, Marcia, Timefulness: How Thinking Like a Geologist Can Help Save the World. Princeton, Princeton University Press. (2018).

Gardiner, Stephen M. "On the Scope of Institutions for Future Generations: Defending an Expansive Global Constitutional Convention That Protects against Squandering Generations." Ethics & International Affairs 36, no. 2 (2022): 157–78. https://doi.org/10.1017/S089267942200017X.

KNOWLEDGE

WHAT IS CONSIDERED "NUCLEAR" AND WHO DECIDES?

The nuclear policy field uses and generates a wide range of information (e.g., satellite imagery, military environmental assessments, number of nuclear forces worldwide, etc.), most of which revolve around distinct nuclear things, the obvious being nuclear materials and weapons, as well as corollary objects such as missiles, air force bases, nuclear treaties, among others. Inspired by historian Gabrielle Hecht's work on "nuclearity" (the degree to which an entity is designated as "nuclear" and considered to be of value by governments, academics, scientists, etc.), participants discussed what places, objects, and ideas they believe belong in the nuclear domain and constitute nuclear knowledge.

Hecht, Gabrielle. Being Nuclear: Africans and the Global Uranium Trade. Cambridge, Mass.: MIT Press. 2012.

This led to hard, but illuminating conversations about the epistemological and ontological barriers in the nuclear policy field, mainly the line that separates matters related to nuclear weapons (military use of nuclear technology) and nuclear energy (considered as a peaceful application of nuclear technology). Such boundary does not exist in the context of environmental impact because both nuclear weapons development and the nuclear fuel cycle for energy purposes have contributed to community displacement, environmental extraction, and contamination.

This separation has led to marginalizing the experiences of "downwinders" and "downstreamers" more recently affected by nuclear energy (some of which is ongoing, including the recent license approval to move 1 million cubic yards of uranium tailings waste closer to the Red Water Pond Road community in Navajo Nation) since it is outside the traditional scope of nuclear p. In this sense, nuclear weapons and nuclear energy must reckon with their role in the extractivism economy. If the nuclear policy community is genuinely invested in exploring how it overlaps with environmental issues, it should not only focus on the ways environmental risk, most notably climate change, impact nuclear weapons issues, but also how nuclear weapons – and extractive practices of nuclear activities more broadly – contributes to environmental risk and the acceleration of climate change. economy.

Global Extractivism and Racial Equality, Report of the Special Rapporteur, United Nations Human Rights Council, April 2019, A/HRC/41/54.

Dalby, Simon. Rethinking Geopolitics: Climate Security in the Anthropocene. Glob Policy, 5:(2014). 1-9. https://doi.org/10.1111/1758-5899.12074.

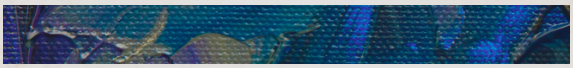
Meaningful intersections between nuclear policy and environmentalism will organically open avenues to knowledge unfamiliar to the nuclear policy field: environmental analysis, hyperlocal anecdotes and other testimonials, Indigenous histories, research processes that are aligned with natural law respected by tribal communities etc. Nuclear policy experts may not have the skills, expertise, or permission to obtain, handle, and study these types of data, especially materials that require relationship-building, community engagement, and cultural awareness. There is already an abundance of knowledge about nuclear legacy sites, but they do not adhere to the conventional format or methodological approach expected of nuclear policy work. It is important to cultivate partnerships outside the nuclear policy field by sharing funding, public platforms, and other resources to learn from these different spheres of knowledge and support their contributions to nuclear history and policy. In pursuing these partnerships, it is important to identify and address power dynamics such that all expertise is duly respected, credited, and compensated rather than co-opted (e.g., Indigenous ways of knowing are seen as legitimate as government or academic experience). While the environmental field is more likely to recognize non-Western research methodologies than the nuclear policy field, it still has a long way to go in giving Indigenous traditional ecological knowledge its overdue credit as a significant contributor and source of inspiration for environmental policy.

Rock, Tommy, Ingram Jani C. Traditional Ecological Knowledge Policy Considerations for Abandoned Uranium Mines on Navajo Nation. Hum Biol. 2020 Nov 17;92(1):19-26. doi:10.13110/humanbiology.92.1.01.

Albuquerque, U.P., Ludwig, D., Feitosa, I.S. et al. Integrating traditional ecological knowledge into academic research at local and global scales. Reg Environ Change 21, 45 (2021). https://doi.org/10.1007/s10113-021-01774-2

When one approaches the issue solely from a nuclear policy perspective, one tends to think about the impact through a narrow set of criteria, for example, whether there is a release of radiation or not, which then molds our understanding [according to Gabriella Hecht] of what is and what is not considered "nuclear." The criteria are guided by specific scientific or security determination, which in turn frames the policy: how to protect individual citizens from being exposed, which groups to compensate, which groups don't qualify [for compensation] etc. There is no room to frame this as a community issue at all – there is no space to think about the impact of nuclear weapons culturally, environmentally, and historically.

AN ACT OF CARE



In the summer of 2023, Bombshelltoe Policy x Arts collaborated with artists Gabriella Hirst (Berlin / Sydney), curator Warren Harper (Toronto / London), Tammy Nguyen (New York), and youth educator Jacklyn Waight (Los Angeles) to bring Atomic Terrain to the general public in the form of art-and-gardening workshops. During these events, they presented plants touched by nuclear catastrophe and diplomacy, with special attention to Hirst's *Rosa Floribunda "Atom Bomb"* — a rare species of garden rose developed in 1953 by German rose breeder Reimer Kordes.

The team hosted intimate workshops in New York, Washington, DC, and Los Angeles, reaching over 250 people with varying lived experiences: some remember the Cold War and worry about growing apathy towards nuclear issues, while others who do not think about nuclear weapons at all and are more concerned about climate change.

Hirst, Gabriella. "'How to make a bomb', https://gabriellahirst.com/How-To-Make-A-Bomb.

Using plant life as a familiar point of reference helped anchor productive conversations about the relationship between nuclear and environmental violence, which traditionally is too overwhelming to process for citizens who already feel tired, helpless, and disempowered. To graft an Atom Bomb rose — to touch the soil, tend to flowers, listen to stories about landscapes, places, and nuclear conflict — is a small yet surprisingly powerful act of care that re-energized workshop participants, and encouraged them to include these issues as part of their political awareness and activism.

Atomic Terrain public programming will return in the Spring of 2024 as a week-long exhibition at the forthcoming New York Art Book Fair (April 25 - 28) — one of the largest and most prominent book fairs in the world.

GAINING PUBLIC TRUST

Both the nuclear policy and environmental fields are eager to engage different facets of the general public with the hope of creating enough pressure on governments to address their respective concerns. These efforts enjoy varying degrees of success: while nuclear issues received renewed public attention due to fears of Russia using nuclear weapons on Ukraine, the threat of nuclear weapons generally trails behind climate change as an urgent issue today. While there is still much to be done worldwide to mitigate the impending effects of climate change, targeted public pressure in recent years contributed to significant climate-relevant rule-making in countries like the United States, as well as members of the European Union. The same cannot be said about nuclear p; a recent survey found that most Americans have limited familiarity with nuclear weapons issues and are not inclined to get involved beyond voting (e.g., attending protests or writing to a public official), although there is interest to learn more. Atomic Terrain participants considered the role of cultural products, especially the success of Christopher Nolan's *Oppenheimer* film, in facilitating public conversations about the impact of nuclear weapons. Of particular interest are the ways in which *Oppenheimer* triggered a public debate around what was sacrificed and erased while scientists built and tested the first nuclear weapon in Los Alamos: the health, cultural, and environmental wellbeing of the Pajarito Plateau and local communities including Nuevo Mexicanos and Pueblo peoples.

Albeit indirectly, *Oppenheimer* opened opportunities for Indigenous and other frontline scholars to talk about land displacement and contamination on their terms, which nuclear policy experts and environmental scholars can amplify and support. The public critique on what *Oppenheimer* omits shows the powerful potential of narratives to acknowledge local and environmental dimensions of nuclear weapons, especially at a time when a subset of the public (typically younger and progressive-leaning) is eager to exercise an environmental and social justice-oriented consciousness on foreign policy. That said, there are ways to leverage and expand the narrative, including a more concerted effort to publicly explain and name which government entities are responsible for maintaining and ultimately cleaning up contaminated legacy sites (e.g., the role of the Department of Energy and national laboratories), or how the U.S. government's current multi-year nuclear modernization project will further alter the environments of so-called "nuclear sponge" states (Colorado, Montana, North Dakota, Nebraska, and Wyoming).

Judge-Lord, Devin. Making Policy About Climate The Climate Movement's Impact on Agency Rulemaking. https://judgelord.github.io/cj/cj.pdf

European Commission. "Citizen Support for Climate Action, 2023 Surveys." https://climate.ec.europa.eu/citizens/citizen-support-climate-action_en

Smeltz, Dina et al. "Majority in US Want to Learn More about Nuclear Policy" The Chicago Council on Foreign Affairs. Public Opinion Survey, July 2023.

Gomez, Myrriah. Nuclear Nuevo Mexico Tucson : The University of Arizona Press, 2022.

Korda, Matt. White, Tricia. "Nuclear Weapons: ICBM Information Project" March 2023, https://fas.org/initiative/icbm-information-project/

Missiles on Our Land, Princeton University www.missilesonourland.org

Atomic Terrain participants debated the type of communication and education the public should receive about nuclear legacy sites, may it be contaminated (Church Rock) or officially remediated (Rocky Flats): How did the contamination happen? How will it manifest for years, if not decades? What should people expect from the government moving forward? What would be a reasonable "cleaned" state (to the extent it can be cleaned) for these places? One obstacle is acquiring raw data related to contamination, particularly those considered confidential or proprietary information by the companies or the government. According to one participant, in some cases, only the results of exposure studies are shared, but the data used for analysis are not made publicly available.

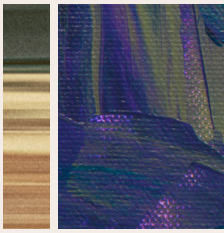
As communities living near these sites shift and grow over time, it can be hard to maintain collective memory and track accountability around nuclear exposure over the course of decades. This is especially evident in the layered narratives of Rocky Flats, Colorado, where the U.S. government remediated a disused nuclear weapons production facility, including the transformation of a 4,000-acre buffer zone separating the central contaminated site into a wildlife refuge. Although often cited as a successful example of "weapons to wildlife" model, environmental activists and concerned citizens worry that the refuge erases the toxic history of the place, in particular the wilful neglect and irresponsibility that resulted in significant plutonium contamination. Some Atomic Terrain participants familiar with the area shared how new homeowners do not know about the "pre-refuge" history of Rocky Flats. Even as the refuge thrives, there are uncertainties around future ecological changes – the presence of invasive weeds or the larger impact of climate change – and how this would alter the risk of exposure for humans and non-humans alike. Today, environmentalists question plans to build an 8-mile recreational pathway in Rocky Flats without a thorough health and environmental evaluation. In general, any effort to redress the environmental impact of nuclear weapons must wrestle with how non-humans and humans coexist in contaminated spaces: is it possible to champion natural biodiversity and human health at the same time?

Coates, Peter. From hazard to habitat (or hazardous habitat): The lively and lethal afterlife of Rocky Flats, Colorado. Progress in Physical Geography: Earth and Environment, 38:3,(2014), 286-300. https://doi.org/10.1177/0309133313513296

Physicians for Social Responsibility, "PSR leads lawsuit against proposed Rocky Flats trail" January 2024, https://psr.org/psr-leads-lawsuit-against-proposed-rocky-flats-trail/.

Lastly, Atomic Terrain participants touched on the ways language can make or break trust, particularly in introducing initiatives such as "consent-based siting," which aims to engage the needs and concerns of local communities in determining future locations of nuclear sites, including nuclear waste storage. Some participants pointed out concerns with the phrase "consent" given that the value of consent has not historically existed between government entities and communities (especially Indigenous communities), and in most cases has been deliberately forced removal. To take "consent" in good faith, these initiatives must be simultaneously matched with demonstrable work to repair broken relationships and seriously address existing contaminated sites.

National Parks Service, Manhattan Project National Park. "Stories of Displacement" https://www.nps.gov/mapr/learn/historyculture/displacement.htm



THE FUTURE: DOING MULTI-SCALAR WORK

It can be difficult to view the world from different vantage points (ecological, local, national, global) simultaneously, or apply an environmental or intergenerational timeline into nuclear policy especially when nuclear threats demand immediate attention and action. It runs the risk of having too broad a scope or lacking parameters that yield specific policy solutions. But business as usual — nuclear policies that make little to no room for environmental considerations — runs the risk of sacrificing something greater: the ability to see beyond the narrow bounds of national or international interests.

"Multi-scalar" thinking — delving into relationships across spatial contexts and/or time scales — is an opportunity to expand the definition of "nuclear" policy in a way that considers all life forms, with the understanding that the well-being of the planet is connected to humanity's own. Multi-scalar work may not be standard practice or seldom referred to in the realm of nuclear policy, but it is emergent in the anthropology and ecological disciplines, and is at the heart of Indigenous scholarship.

At a practical level, Atomic Terrain participants also noted that multi-scalar work encourages "translating" nuclear policy for different audiences: what matters at the international level may not resonate at the local level, thus analysis that looks at various scales could have the advantage of appealing to a range of stakeholders. Within the nuclear policy field, there is already a growing body of work investigating how the inevitable consequences of climate change impact nuclear weapons facilities and policies. While this is a critical area of research, it is not the only prism through which the field views the intersection of nuclear weapons and the environment.

Kwong, Jamie. "How Climate Change Challenges the U.S. Nuclear Deterrent," Carnegie Endowment for International Peace, 2023. https://carnegieendowment.org/files/Kwong-Climate_Change_and_Nuclear_Weapons.pdf

It is equally important to ask how the current structures and systems that constitute nuclear policy (including nonproliferation, arms control, and disarmament) impede or contribute to environmental good. This ventures into new lines of inquiry:

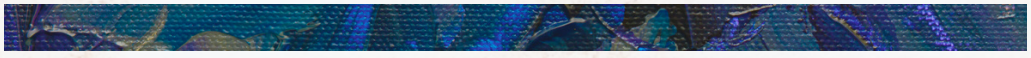
Is it possible to include environmental commitments (e.g., repurposing or remediating former nuclear sites) as part of future nuclear arms control initiatives?

How can existing international instruments (the Comprehensive Test Ban Treaty and the International Monitoring Stations) contribute to climate studies?

What does responsible land management of nuclear-specific military landscapes look like, especially taking into consideration security / safety risk posed by climate change?

What are some ways to integrate "deep time" thinking — considering geologic timescales that stretch across millennia — in nuclear policy-making, especially how we tackle nuclear waste?

Pursuing these questions requires new expertise that can appreciate a mosaic of data — from soil samples to community anecdotes to national policies — that enriches how the nuclear field integrates environmental work. This could also lead to new branches of nuclear policy scholarship that propose a framework of security that is not exclusively tethered to country interests and instead recognizes local and ecological considerations. Doing so can make space for policy options that encourage collective international action rather than dominance. While this may seem impossible when international relations are predominantly seen through the prism of power, the age of the Anthropocene behooves us to entertain a new kind of security thinking, one that sees the value of connectivity rather than competition because the threat of the Anthropocene — may it be an unhinged, uncontrollable nuclear escalation or the gradual pounding of the climate crisis — know no borders and is a threat to us all.



The work of Atomic Terrain — a group of nuclear experts, environmentalists, anthropologists, and artists working together to build cross-disciplinary programs and knowledge about nuclear weapons and the environment — was made possible by the generous support from **Ploughshares Fund, Equity Rises initiative.**

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