

Landscape Medicine: Ciphers of Vulnerability Within Landscapes of Risk

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With climate change, increasing fires, ethnic polarization, rising chronic disease, and a shifting economy towards healthcare and chronic disease management; hotspots (network nodes) come to embody points of vulnerability, crisis, and potential structural change. In California, hotspots of risk often coalesce edge conditions of creek, wetland, and oak woodland; populated by marginalized communities including illegal aliens, migrant farm workers, indigenous groups, and displaced people. These communities take on embodied risk, physicalizing large scale socio-economic and ecological patterns, raising questions of subaltern power dynamics and confidentiality. By deploying remote sensing methods framed by psychosocial participant mapping techniques in these hotspots, confidential data streams associated with risk and prevention can be developed. By looking at food stewardship through traditional ecological knowledge, the psychosocial is married to physical ecological indicators in place through process. I propose to research an adaptive management based mapping methodology that highlights these hotspots and their finely tuned levers of risk reduction in real time.

Anthropocene, the Age of Landscape Medicine

In 2017, The US GDP was derived 18% percent from health care; a \$3.5 trillion industry, of which three quarters is in chronic disease - lifestyle - management.¹ In 2009, healthcare surpassed manufacturing in total jobs and in 2017 healthcare surpassed retail as the nation's largest employer.² This indicates an anthropocene shift from a resource extraction economy based in "land" and "its resources" and "products,³" to a human system in which human beings are both the resource to be extracted,⁴⁵ the site of manufacture,^{6 7} and the product to be sold.^{8 9} We are the environment;¹⁰ and we also own the means of our own production.^{11 12 13}

However, in this system, not all people carry the same economic value potential, and not all places carry the same people. A single homeless individual can make the system hundreds of thousands of dollars each year in procedures.¹⁴ Some locations cluster people with many co-morbidities,¹⁵ in which socio-ecological flows have embodied greater risk;^{16 17} a gold mine for late capitalist economies of health.^{18 19} The nation's largest private health insurer, UnitedHealth, just pledged \$400+ million to create housing for the most vulnerable in 30 markets by 2020.²⁰ These are the landscapes of risk, hotspots of constant crisis and conflict where economic and legal systems are constantly made actionable.^{21 22}

These network nodes²³ are the landscapes²⁴ most likely to burn, sink, be displaced, and also to cause civic and social unrest.^{25 26} They are high risk.

Methods: Mapping Risk with Ecological Models

By layering maps, it's possible to assess landscapes of collective health risk:^{27 28 29} the most likely to burn, and cost insurance companies. These locations intersect social and economic factors, physical factors, and psychosocial frameworks.³⁰ It will be essential to research how to physically and socially map these hotspot locations in more detail.^{31 32 33 34}

Within the hotspot, psychosocial mapping with high risk individuals themselves frames the key levers of change and value.^{35 36} This is particularly important because of the convergence of landscape and human beings³⁷ in the anthropocene, in which social and economic embodiment plays out extremely differently based on how people see their own environment.^{38 39} Open systems theory, cybernetics, and artificial intelligence⁴⁰ all point to the importance of network nodes for constant feedback and framing in self organizing systems.^{41 42}

As people living in tent cities, labor camps, and other hotspot locations describe their environment; what physical indices they signify become key frames in their shared cybernetic embodiment of risk.^{43 44 45} This inside perspective is essential for understanding the levers of actionability within the landscape of risk, and creating adaptive management on a system scale.⁴⁶ It's also essential to understand what are the most heavily weighted factors - in terms of risk embodiment - to map out using imagery.^{47 48 49 50}

Physical indices - patterns of use embodied in plants, paths, roadways, settlement patterns, tents, treated and untreated sewage, trash, water quality - can be mapped with satellite imagery, remote sensing devices, phyto forensics, and drones to provide detailed maps to help us understand how inside frameworks of meaning and understanding fit into large scale ecosystems of risk.^{51 52 53 54 55 56 57} We need to understand which plants are the closest physical indicators of shared psychosocial value,⁵⁸ whether consciously articulated by the community or not.^{59 60 61 62 63}

As we come to understand very finely detailed maps of risk, in terms of their indices of risk - aging infrastructure, topographic grade, soil quality, plants present, trash objects, scent, seasonal change, population movement, insects, birds and other animals present within the hotspot^{64 65} - we can begin to pinpoint locations where we can propose projects to make structural change to reduce risk⁶⁶ on an ecosystem level.^{67 68 69} There are also relevant considerations of how risk may play out in terms of ecosystem change.^{70 71 72 73 74 75} What I aim

to research is how to connect this kind of large scale imagery of landscape data with the psychosocially relevant data set within the network node^{76 77} - to affect the flow of risk with an adaptive management approach.^{78 79 80 81}

Making this feedback loop tighter and closer to real time, also means developing methodologies in which the mapping process is simultaneously seen and framed at a human scale⁸², and acquired and related to the larger scale of the hotspot and the context of the landscape.^{83 84} This work builds on neuroscience photo feedback studies⁸⁵ and also the relationship between interpretation of data streams and patterns in the brain and the larger landscape^{86 87 88 89}

Risk mapping falls into a long tradition in sociology and insurance; including redlining, and needs to be duly criticized.^{90 91 92} It also falls into a tradition of engagement, greenwashing and redwashing, in which high risk communities become spokespeople of neoliberal development and, often, their own removal.^{93 94 95}

The agency of healthcare changes this legacy only slightly, perhaps for the economy of 21st century health crisis, rather than the manufacturing economy of the 20th century.^{96 97 98 99} However, knowing this legacy of exploitation makes it essential to work out new methodologies of social critique and also confidentiality and cryptography within this space.^{100 101}

Cipher cryptography

The cipher (sometimes written “cypher”) a cryptographic black box,^{102 103} is a space of physicalization of risk,^{104 105 106 107 108 109} often found within sites of marginalization, social ecotones.^{110 111 112 113 114 115 116 117 118 119} There is a long tradition of ciphers in intercultural African American led design.^{120 121 122 123 124 125 126 127} Although cryptographic cipher systems recently have taken on an economic token quality with the spread of online blockchain use,¹²⁸ many examples of confidentiality around landscape data systems can be found in use in indigenous communities.^{129 130 131 132 133}

As indigenous communities are often marginalized by mainstream grid systems, these communities find themselves carrying the weight of socio-economic marginalization.^{134 135 136 137 138 139} 19th century and 20th century policies place an inordinate onus of resource extraction risk on Native American people.^{140 141 142 143} Many communities can attest to this in California and around the West.¹⁴⁴

Social risks become embodied much more highly in native communities and today in rural communities in general within spaces of marginalization.^{145 146} The risk of suicide runs high;¹⁴⁷ many times higher than the US homicide rate;¹⁴⁸ and the Native American risk of being shot by the police (in the US) is even higher than that for African Africans.¹⁴⁹ Half of American Indian women have been sexually assaulted,¹⁵⁰ more than double that of the US average.¹⁵¹

These are all reasons why sovereignty, and government agency in general, is called into question and is constantly reinterpreted within these spaces.^{152 153 154} It is exactly this shifting legal landscape that does not just call into question and shift local Indian law, but also federal, state law, and subsequent environmental policy.¹⁵⁵

Therefore, ciphers of confidentiality and imagination that can be maintained within spaces of traditional ecological knowledge are far more adaptive and resilient than top down colonial grid structures of environmental management.^{156 157 158 159 160} While the grid structures changes through “technology,” and it’s “progress” model;¹⁶¹ traditional ecological knowledge and ecosystem stewardship is adapted and maintained through connection with a confidential cipher - a black box of imagination that is kept within the community.^{162 163 164 165 166 167 168 169 170 171 172}

The Columbia River treaty tribes are an extremely powerful example of this.¹⁷³ A population of about 40,000 people over a few dozen traditional communities in the Pacific Northwest have

been able to not just influence the ecosystem restoration of a vast territory - about one fourteenth the area of the lower 48 states, with about 5 million people - the treaty tribes have been able to actually force ecosystem restoration to be legalized and implemented through the Fish Accords, a settlement resulting from decades of legal battles.^{174 175 176 177 178} On the surface, this appears to be a purely legal win. However, the power of the treaty tribes does not reside purely in the law as decided in 1855, it resides within the continued practice of the “usual and accustomed” legal rights set aside in the federal treaty of 1855.^{179 180 181 182} In other words, it’s the day by day lived experience of this population that makes this law enforceable.¹⁸³

More so, the lived experience - the locations of usual and accustomed sites of digging roots, fishing, hunting - is confidential within the community. It’s not owned by any particular agency of one tribe, or one group of map makers.^{184 185 186} It’s open to a process of constant remembering by people themselves as we make meaning in our own lives.

Hotspots

All along the West Coast, hotspots are shifting as infrastructure breaks down and spaces of risk move.¹⁸⁷ What remains constant is that vulnerable populations remain within these spaces, and lived experiences form black box ciphers of adaptive management for ecosystem change and risk reduction.

Particularly in California, our points of vulnerability are similar to the northwest, but not identical. While Pacific Northwest treaty tribes have managed to secure legal rights through a cipher of lived experience; in California, treaties were not ratified,¹⁸⁸ indigenous groups were killed by the state in programs of ethnic cleansing,^{189 190 191 192 193} enslaved on private estates,^{194 195} and removed en masse in the early 20th century,^{196 197} only to return often as illegal aliens.¹⁹⁸ Here in California, indigeneity is often about alienation and lack of recognition,¹⁹⁹ creating a gray area of intercultural exchange in which a variety of people in spaces of marginalization can lead the way for ecosystem stewardship.²⁰⁰ Hotspots often appear at internalized locations of conflict of identity,²⁰¹ where shifting systems require rearrangement.^{202 203}

Hotspots also appear at locations where infrastructure breaks down. Sparks from the aging PG&E electric grid caused the massive disastrous Paradise Camp Fire and Kincade Fire and triggered preventative power outages throughout the state.^{204 205} The effect on hillside and suburban real estate values remains to be seen, but both Paradise and Kincade happened in exurban locations with high populations of retirees, elders, and native communities among oak woodlands. The relationship between aging property ownership systems and aging electric and utility infrastructure needs to be explored.

In terms of developing a model around prevention, these populations would do well to learn from examples of indigenous management within similar spaces of risk.

Traditional foods as innovative approach

In recent years, food has been a key element of programs of adaptive management. The Columbia River intertribal model stands as a strong precedent.^{206 207 208 209} In California too, resource management plans have been developed around traditional ecological knowledge.^{210 211 212 213} There is extensive research around the traditional use of fire^{214 215 216 217 218 219 220 221} in the management of basketry,^{222 223 224 225} native grassland,^{226 227 228 229 230 231 232 233} and the management of oak populations for the traditional consumption of acorn as food.^{234 235 236 237 238 239 240 241 242} There are also resiliency studies around relationships between health of populations at risk and traditional foods^{243 244} such as salmon,^{245 246 247} as well as locally based indigenous led climate change adaptation,²⁴⁸ and the stewardship of traditional sites.^{249 250 251}

In researching a landscape adaptive management approach to reduce risk in terms of disastrous fires in California,^{252 253 254} it will be essential to also consider how traditional ecological models maintain an effective black box cipher for confidential adaptation within the community.

Therefore there are several directions of research that meet here in the agency of traditional foods. One is mapping, from the outside-in, these hotspots of risk which coalesce at edge conditions. The other is the mapping, from the inside-out, from the perspective of people within communities that occupy these hotspot edge conditions of risk. Where the two directions meet is a confidential space in which traditional ecological knowledge is produced through lived experience of risk and management in real time.

Research plan

I am proposing a course of research here in ecosystem adaptive management through hotspots of physical vulnerability in health in which I look deeply into precedents of environmental planning that emphasize traditional ecological knowledge and lived experience.

1. Map out hotspots, locations of ecological vulnerability in aging infrastructure, social and economic edge conditions, and physical indices in plant populations
2. In hotspots, deploy methods of participant observation and ethnographic fieldwork to assess frameworks of confidential psychosocial feedback.
3. Use ethnographic fieldwork methods to document ciphers of confidential psychosocial feedback and use remote sensing methods to map these hotspots' shifting material extents evident in landscape plant and animal populations.
4. Discuss how understanding and mapping these kinds of community led programs of adaptive management can come to be an effective method of disaster prevention and health improvement in the 21st century.

Anthropocene, the Age of Landscape Medicine:

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