URBANISM AS ISLAND LIVING

SEAN CONNELLY

I am from Oʻahu. Growing up, all I knew about watersheds was that the stream near my house in Kāneʻohe was a tunnel that went to the sewage plant. At my Filipino Grandma's house in Kalihi, the stream was down the hill at the end of the street, but too dirty to swim in so I never went. When I'd go around Honolulu, I remember thinking how ugly the buildings were. I would think, if only someone would design better buildings, maybe we could better protect Oʻahu's natural beauty. So I decided to study architecture and urban design in college. I explored everything that interested me, like fractals, ecology, political economy, decolonization, sustainability. I learned aesthetics alone wasn't going to make Hawaiʻi a better place. I questioned what "better" even meant. I dreamed of more than a "war on ugliness." That buildings, like schools, didn't just need to be beautiful, but should also grow food, generate energy, and harvest rainwater for their surrounding neighborhoods.

An important influence was learning about traditional Hawaiian resource management, and how Hawaiians invented the ahupuaʻa to grow more food in a smaller area of land to support growing populations. That traditionally, Kāneʻohe had more than just a fertile bay. It also had a beach, because the land was organized to ensure access to resources from mountain to ocean. As I learned more about the watershed and its streams—natural, channelized, or hidden away—I realized how little a presence they had in the places I lived growing up. Even though I lived in Kāneʻohe for most of my life, it wasn't until recently that I actually got to see where the stream meets the bay—one of the most important parts of the watershed—because the shoreline today is mostly privately owned. It began to feel like I didn't even know my home, anymore. . . .

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Urbanism, or the way of living in urban areas, is like a foul word in Hawaiʻi. In many ways, it represents everything we hate about this place—traffic, sprawl, overcrowding. Historically, urbanization, or the growth and development of

urban areas, has caused many of our problems. Our dependence on imported toxic energy and industrialized food resources, the contamination of our streams and beaches, and overall environmental degradation can be linked in some way to the process of Hawai'i becoming an urban place. Waikīkī, Salt Lake, Enchanted Lake, and now Ho'opili, Koa Ridge, and Kaka'ako, exemplify Hawai'i's conflicted relationship with urbanism. O'ahu, once the most fertile of the islands, is now among the most polluted, congested, import-dependent metropolises in the United States.

Yet, with 91.6 percent of Hawai'i's total population currently living in an urban area—98.4 percent on O'ahu, 58.5 percent on Hawai'i Island, 81.3 percent on Kauai, 87.5 percent on Maui—urbanism is an unavoidable part of our future.[1] Whether we like it or not, "island living" is a predominantly urban condition. How can we protect our already jeopardized environment and unique island lifestyle in an urbanized world? The urgency of this conditon is astounding considering that, before western contact over two centuries ago, Hawaiians once supported almost the same population—sustainably—on the islands.[2]

What if we redefine urbanism as island living? A form of ecological urbanism, as a way of life that is rooted in Hawai'i's history, culture, and ecology? An urbanism that reaches beyond the imagery of palm trees, pineapples. suburban homes, and condo towers, and restores watersheds—the forests, streams, and beaches that capture and filter all of our freshwater—as the foundation of our politics, economics, and built-environment (the buildings and infrastructure that make up the places we live, work, play, grow food, and obtain other resources).

To summarize a future vision for an urban island living: Hawai'i is a place where healthy neighborhoods raise resilient communities on clean, renewable energies and locally-grown organic foods and materials, with less congestion and lots of open space. A place where our robust economy supports innovative local businesses and artists, and provides fulfilling jobs for everyone, with opportunities to invent new kinds of jobs for those who choose to pursue them. Where political districts reflect the hydrology of the watershed. A place where everyone has access to well-funded public schools that generate electricity, harvest rainwater, grow food, and host weekly farmers markets, and all of the activities are also integrated in students' curriculum. Where everyone has access to quality housing options for multigenerational families, with rooftop and community gardens. A place with less traffic, and safer, more comfortable streets for bicyclists and pedestrians. A place where streams have been reclaimed and restored as publically accessible nature resources. A place where watersheds, sacred places, and other natural resources are protected, restored, and flourishing with native wildlife and Hawaiian culture. This vision relates to a larger problem of survival: how to provide enough food, clothing,

and shelter for a growing population to live healthy, abundant lives, while still protecting the environment.

But so what? While it is easy to speak generally about a broad vision, it is difficult to choose the details of what that vision could or should actually look like, and how to make it reality. Some believe the solution is to return to a completely rural way of living, with plantation-style homes scattered among agricultural fields. Others think we need to completely urbanize, and live in shiny towers to preserve open space. The best solution most likely rests somewhere in the middle of these extremes. This debate is frustrating. How do we design our buildings, streets, neighborhoods, and infrastructure in a way to remake urbanism as island living? Thankfully, we have a starting point with traditional Hawaiian resource management—the collective knowledge of how to live on an island, how people coexist with their watersheds.

TRADITIONAL HAWAIIAN URBANISM

The conventional western perception of traditional Hawaiian society as agricultural and rural goes back to 1778. When Captain Cook arrived in Hawai'i, he did not fully understand what he saw: "The houses are scattered about, without any order, either with respect to their distances from each other, or their position in any particular direction."[3]

Although the houses he saw were scattered, they were far from disorderly. Since the pre-capitalist Hawaiian economy relied upon reciprocity and gift giving in an environment that provided everything needed within a close proximity, the dwellings did not need to organize around markets in the same centralized settlement patterns as villages in Europe. Hawaiians consciously dispersed their kauhale among a field of food and other material resources, according to access, adjacency, and alignment with these resources.

What if traditional Hawaiian resource management was reframed as traditional Hawaiian urbanism? Traditionally, Hawaiians were an urban civilization. This is a powerful perspective shift that creates new possibilities for what it can mean to be urban in Hawai'i. By "urbanism," I don't mean the images of what we consider urban today: buildings, streets, power lines, congestion. I mean a way of life organized around a physical infrastructure engineered to distribute resources, a political structure that manages it, and a concentrated population generating and consuming resources within a density of mixed land-uses that correspond to economic functions. Hawaiians had all of these aspects of an urban system. Their urbanism just looked different because it was unique to the ecology of an island, not a continent.[4]

To offer a reinterpretation: traditional Hawaiian urbanism emerged in response to environmental crisis, and the challenge of providing enough food, clothing, and shelter for people to live healthy, abundant, and thriving lives

without completely destroying the environments that supply the materials and resources needed. Twelve to fifteen hundred years ago, when the first peoples arrived to Hawai'i, they burned the forests and brushlands to clear land for agriculture.[5] Over time, the slash-and-burn technique could no longer support the demands of the growing population, as the consumption of natural resources exceeded the environment's capacity to replenish itself. Ecosystems began to collapse and many species became endangered or went extinct.[6] However, around 1100 AD, things began to shift. A new way of island living capable of supporting the growing population in proportion to the carrying capacities of each watershed began to develop. By 1200 AD, roughly around the reign of Mā'ilikūkahi, the chief who is said to have established the dominance of the ahupua'a system, evidence of slash-and-burn vanished, not reappearing again until after western contact. During these hundred years of transition, Hawaiians co-evolved with the land, searching for the insight to live intelligently and compassionately on Earth's most isolated, fragile environment. Hawaiians began to urbanize.[7]

The catalyst for traditional urbanization was the innovation of a large-scale infrastructure that distributed freshwater to lo'i kalo and loko i'a (taro patches and fish ponds) via a network of 'auwai (irrigation ditches).[8] This system was engineered to plug into the hydrology of the watershed, and designed to assist the natural flow of water, reinforcing the relationships between forests that attract and capture the rains, the streams and wetlands that filter it, and the shorelines that eventually receive it. This system was so effective, it intensified the cultivation of food by 100 times the previous amount.[9] Over time, this system became ingrained in the natural hydrology, and transformed the watershed itself into an advanced technology—a tool to intensify the production of food and other resources. The system was so advanced, specific names were given to the unique winds and rains of each area, allowing Hawaiians to relate culturally to the technical inputs and outputs of their watersheds.

To manage this technology, land was organized into a hierarchy of political land-use districts that linked government and economy to the unique geology and ecology of each watershed, taking into account resources like elevation, water flow, weather, wildlife, and other spiritual phenomena. The most well known of these land-use districts was the ahupua'a.[10] Areas with more freshwater were made smaller because more leaders were needed to manage the distribution of water, while areas with less water were made larger to provide enough land for dry-land farming, which requires land to lay fallow between crops. This ensured equal access to the range of resources available from mountain to ocean. The ahupua'a, in many ways, was the Hawaiian version of a city or town. Hawaiians thus lived among the places where they grew food and obtained resources, sharing surplus resources with other ahupua'a.

FRAGMENTATION OF THE WATERSHED

Over the past two centuries, the relationship between urbanism and the watershed has changed drastically. Traditionally, urbanism was organized around a unified process that related the infrastructure and political economy back to water, designed to maintain access to the watershed as a continuous system of resources from mountain to ocean. Urbanism in Hawai'i today, however, is organized around fragmented economic, political, and social processes that destroy the connection between mountain and ocean, causing an overall decline of the watershed as a healthy productive system. This change reflects the fact that we no longer directly depend on our watersheds for food. We ship almost everything in. The current fragmentation of the watershed can easily be observed, graphically, in relation to our infrastructure, zoning, and political districts.[11]

STREAM CHANNELIZATION

The reengineering of meandering rocky streambeds into flat, straight, concrete channels disrupts the natural hydrology of the watershed and its ability to filter and absorb fresh rainwater, and produce food (see Figure 1). Without rain, the flat surface of the channel spreads water into a thin veneer, becoming too hot in the sun to sustain wildlife. When there is rain, the flat surface causes a dangerous surge of water that carries harmful effluents—fertilizers, pesticides, oil, and other pollutants from nearby urban and agriculture areas—into the ocean.

SINGLE-USE LAND-USE DISTRICTS

The size and functions of contemporary land-use districts are based on arbitrary economic functions rather than the vegetation, rainfall, weather patterns, and soil types of each watershed. In 1961, all the land in Hawai'i was classified into one of three districts: urban, agricultural, and conservation (in 1963, a rural district was added). At the time, this was considered very innovative because Hawai'i was among the first governments in the nation to implement a statewide zoning measure in efforts to limit development and protect the environment. Despite these intentions, aspects of this zoning framework actually contribute to the destruction of our watersheds. Typically, only mountain areas are zoned for conservation while the rest of the land areas are zoned for urban and agriculture developments. This absence of conservation areas along streams makes it impossible to maintain the stream as the most important ecological link between mountain and ocean. In urban areas, the overdevelopment of the stream area with houses, shopping centers, and gas stations prevents access to the stream as a public natural resource, undermining cultural connections between the public and the watershed. The

Figure 1. This image shows a USGS aerial photo of Mōʻiliʻili overlaid with the traditional ʻauwai system, in black. The solid patches to the left indicate ponds, while the thick band to the right is the original stream, which is now channelized (dashed line)

physical separation of urban and agriculture zones separates where people live and grow food, eroding cultural relationships with ʻāina. These negative effects are exacerbated by the disconnection between land-use and land tenure; the ownership of agriculture lands are unevenly distributed between large corporate entities and local people (see Figure 2).

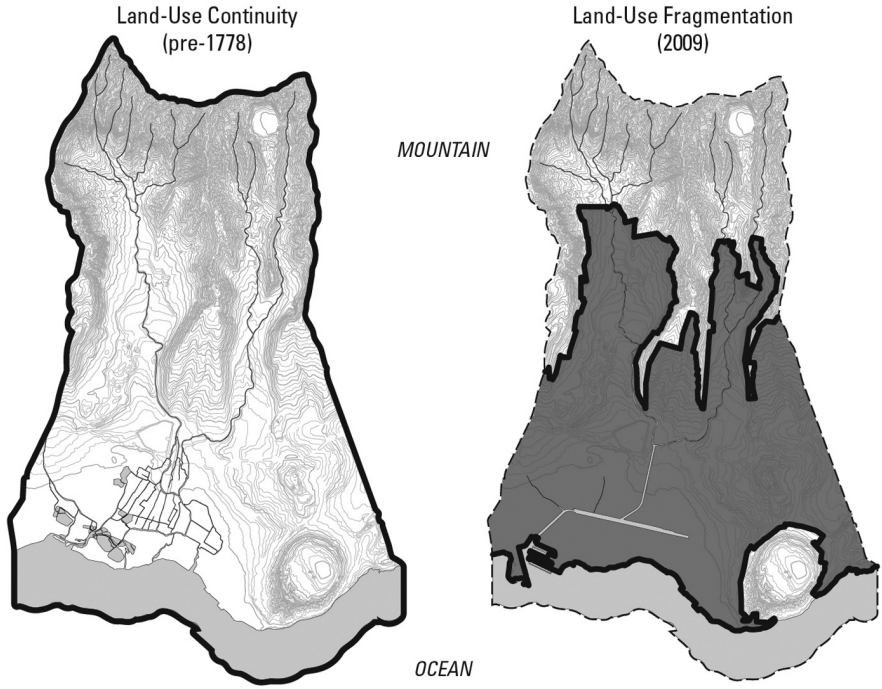

Figure 2. This image of the Waikīkī watershed shows its current fragmentation (right) caused by the zoning of the urban land-use district (grey) between the mountain and ocean, compared to the traditional treatment of the watershed as a continuous area (left).

POPULATION-BASED POLITICAL DISTRICTS

Today the size and boundaries of Hawai'i's political districts are based on population demographics rather than the geological features and ecological capacities of each watershed. This disconnects leadership and their constituents from the capacities of their respected watersheds. Typically, the different jurisdictions of government—City Council, State Senate, House of Representatives—do not align, creating unnecessary complications and inefficiencies in the political system. In highly populated areas, like Waikīkī, it becomes difficult to manage a single watershed as a cooperative unit, while in less populated areas, too many watersheds are lumped into a single political district that may lack adequate political support to properly manage the resources (see Figure 3).

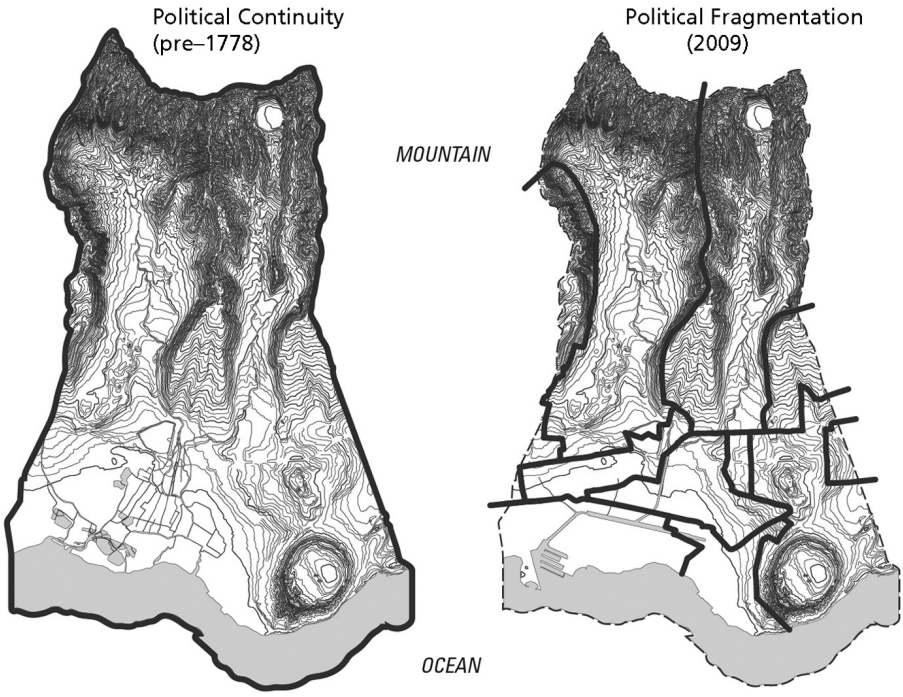

Figure 3. This image of the Waikīkī watershed shows its current fragmentation caused by the division of many political districts between city and state, compared to the traditional treatment of the watershed as a continuous unit.

RECLAIMING HAWAIIAN URBANISM[12]

The fragmentation of the watershed is a major, but often overlooked, contributing factor to our current environmental crisis. This essay is not meant to solve this crisis, but rather to highlight several connecting points that get us thinking about urbanism from a more Hawai'i-grounded perspective. How will changing our perceptions of urbanism help our community rebuild relationships to land, water, ecologies, and histories that sustain us? What will the visions mentioned at the beginning of this essay actually look like in relation to our watershed? These are important questions because urbanism in Hawai'i is rapidly changing, again, in ways that impact almost everything about our lives—from the design of our homes, streets, and neighborhoods, to the kinds of relationships we have with our friends, family, and environments. The positive aspects of this change are that people are talking about renewable energy, recycling more, installing solar panels and solar water heating on their rooftops, cycling, composting, restoring streams, and supporting

more local farmers and local businesses. On the other hand, agriculture lands are being developed for housing. Billions are about to be spent on rail. Building heights are being raised to twice the current limit. We need to find a way to fit all this scattered progressive activity together as a coherent and refined theory for urbanism in Hawai'i, designed to reclaim our island watershed as a more necessary part of our politics, economy, and everyday life. Urbanism, when done correctly, will help us create a built-environment that maintains the overall continuity of the watershed, just as Hawaiians were able to achieve.

What kind of physical changes to our current built-environment would be necessary to make Hawai'i more sustainable over the next hundred years? Some general starting points:

- *Public reclamation of the properties along the stream edge over the course of several generations.*

  The urbanized land along streams should, over time, be returned to the watershed as a publically accessible resource, maintained as something of a public land trust. These spaces would serve as ecological corridors to maintain the health of the watershed, adapt to fluctuations in water cycles (i.e., flooding), provide recreational and educational access to the stream, mountains, and ocean, and reintroduce space for traditional food and cultural production. Committing to the idea of the stream as a foundational organizing element of Hawai'i's built environment, I believe, is enough to catalyze a completely different conception of urbanism in Hawai'i (see Figure 4).

- *Reinterpret city blocks to generate, process, reuse, and manage shared resources, with building heights and densities that correspond to the natural geology and proximity to the stream, forests, and shoreline.*

  Require city blocks to have access to common farming areas, which would promote integrated urban and agriculture land uses within every neighborhood. Rooftop areas can be used for aquaponics food production, clean alternative energy, or water harvesting. The focus on the city block as a productive resource unit would make it integral to the function of the economy in more ways than generating a property tax.

- *Create interdependent economic relationships between the different areas of each watershed.*

  For example, create systems where houses in the valley would harvest rainwater, and houses along the shore would generate electricity. This would create an additional economic flow of resources (in addition to water) that would make the continuity of the watershed more relevant to the local economy. Schools, markets, libraries, and other civic structures could help to facilitate the exchange of these resources. For example, the energy or water generated by the various dwellings and city blocks would be collected at their nearest school or market, which would distribute those resources to other parts of the watershed, or island, as necessary (see Figure 5).

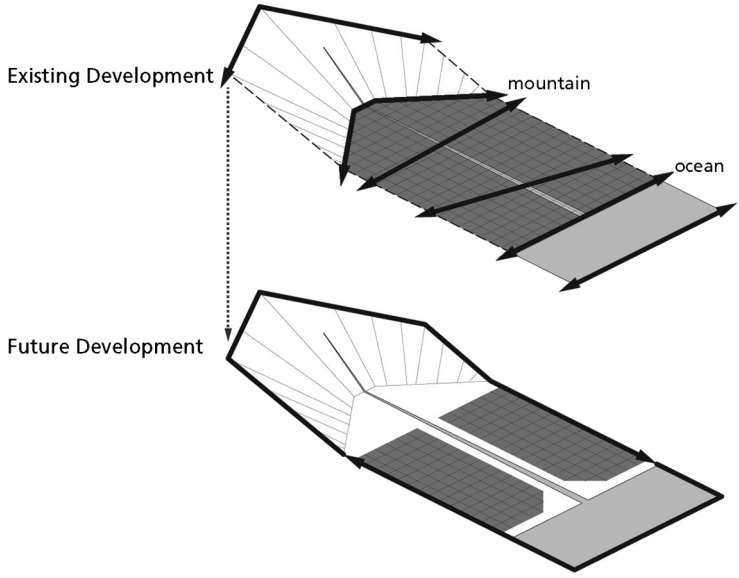

Figure 4. This diagram of the watershed conceptually outlines the current fragmented conditions (top), and a future scenario for development that would enforce a maximum development footprint within each watershed, while the stream is maintained as a publicly accessible resource (bottom).

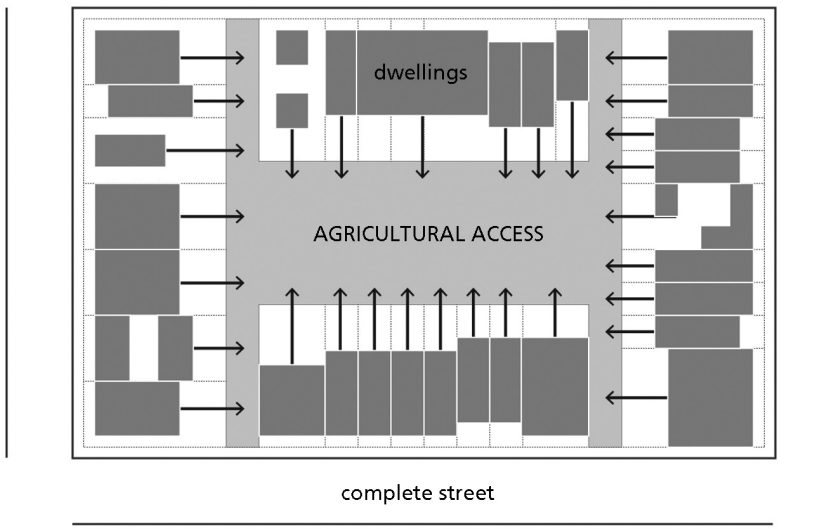

Figure 5. This diagram of a city block shows a conceptual arrangement of zero-lot line dwellings organized around a commonly accessible agricultural common.

These are only a few of the many possible starting points for a framework for a future Hawaiian urbanism. All this would require major top-down policy changes and public debate, lots of money and time, and slow changes over generations. Reclaiming Hawaiian urbanism is a powerful way to localize our economy and reestablish a government, land-use system, education system, water and energy system, and food and resource system whose core processes are aligned with the ecology of the watershed. The places we live are the physical and emotional records of the political, economic, and cultural processes that shape our lives. The only way to change positively these processes and take ownership over them is to change positively the ways we understand and implement urbanism.

NOTES

1. Globally, 50 percent of the world lives in an urban area, with an estimated increase to 70 percent by 2050. The urban demographic in Hawai'i reached the 50 percent mark between 1920 and 1930. Department of Business, Economic Development & Tourism, "Table 1.02—Characteristics of the Population: 1831 to 2010," *2011 State of Hawaii Data Book* (Web, 2011), http://files.hawaii.gov/dbedt/economic/databook/db2011/section01.pdf
2. Lilikalā Kame'eleihiwa, "Traditional Hawaiian Metaphors," *Native Lands and Foreign Desires: Pahea lā e Pono ai?* (Honolulu: Bishop Museum, 1992).
3. E. S. Craighill Handy and Elizabeth Green Handy, *Native Planters: Their Life, Lore, and Environment* (Honolulu: Bishop Museum, 1972): 482. I have not yet learned to read Hawaiian, so the most influential texts I draw upon in this research are often English-language texts. The most important resource for me over the past several years for Hawai'i has been talking story with Hawaiians. Other great people I've talked to have often been active in sustainability, urbanism, and art, or are people who are just frustrated with the current state of environmental degradation in Hawai'i.
4. Urban settlement patterns are classically acknowledged to feature a population density centralized around markets. Because Hawaiian settlement patterns do not exhibit the same centralization around a market, they were written off as a non-urban system. However, I disagree, especially now that the western perception of what constitutes a city or urban area has changed over the past decade, particularly in reference to decentralized or informal approaches to urbanism.
5. Soil samples dating back to 800 AD contain high levels of charcoal particulates, suggesting periods of slash-and-burn agriculture and wildfire. See John L. Culliney, *Islands in a Far Sea: The Fate of Nature in Hawai'i* (Honolulu: U of Hawai'i P, 2006).
6. This kind of theory about societies is forwarded by scholars like Jared Diamond, *Collapse: How Societies Choose to Fail or Succeed* (New York: Penguin Books, 2005).
7. The earliest evidence of 'auwai and lo'i development so far has been dated back to around 1100 AD. See John Culliney, *Islands in a Far Sea.*
8. According to some sources, cities and agriculture developed simultaneously; agricultural processes are created by urbanization, and urbanization by agricultural. Therefore,

they cannot be separated, or thought of as separate, as our current urban-agricultural dichotomy makes us believe. Rather, they are integrated and part of the same congruent system. See Jane Jacobs, *The Economy of Cities,* in the Resources for this essay.

9. Marion Kelly, "Dynamics of Production Intensification in Pre-contact Hawai'i," *What's New? A Closer Look at the Process of Innovation,* eds. Sander Van der Leeuw and Robin Torrence (London: Unwin Hyman, 1989): 82–106.
10. Larger divisions included 'okana and moku, which were managed by ali'i. Within the ahupua'a, land was further divided into 'ili, which were managed by families over generations. While many scholars refer to this as a feudal system, it was not. Families were free to settle in other ahupua'a. While the boundaries varied according to season, the 'ili remained steady, providing a system that was flexible, yet still grounding for the people who lived within that system. See David Malo, *Hawaiian Antiquities (Mo'olelo Hawai'i)* (Honolulu: Bishop Museum, 1951).
11. A graphic analysis comparing traditional and contemporary maps, constructed from geographic information and other data made available to the public online, is a valuable way to express the spatial dynamics of this problem. I chose to look at Waikīkī for both anthropological and personal reasons. It's the most urbanized area, being among the first to be transformed by industrial agriculture, then tourism. I also spent a lot of time in the area, growing up in the Kapahulu area until I was around four, spending endless summers surfing and bodyboarding, and then studying here.
12. This note is just to acknowledge respectfully that I am not genealogically Hawaiian, but that my worldview on urbanism is founded in the knowledge of Hawaiian resource management, and shaped by the specificities that make Hawai'i's environment unique.

RESOURCES FOR FURTHER INFORMATION AND INSPIRATION

1. This essay is based on my research, which I have made publically available online at http://www.hawaii-futures.com. If you have more questions or comments, please contact me through the contact page there..
2. A critical text that shares the history of land use in Hawai'i is by George Cooper and Gavan Daws, *Land and Power in Hawaii: The Democratic Years* (Honolulu: Benchmark Books, 1985). Since I grew up in Hawai'i and did not leave the state until I was eighteen, when I read non-Hawai'i texts, the only way for me to understand them is to rework their messages into a Hawai'i context. This has been a very compelling and enlightening process. Several resources that have been influential for me in this regard, in addition to those referenced in the essay, include:

   Manuel De Landa, *A Thousand Years of Nonlinear History* (New York: Zone Books, 2000).

   William Mitchell, *Cities of Bits: Space, Place, and the Infobahn* (Boston: MIT P, 1996).

   Benoit B. Mandelbrot, *The Fractal Geometry of Nature* (San Francisco: W. H. Freeman, 1977).

   Jane Jacobs, *The Death and Life of Great American Cities* (New York: Random House, 1961).