Climate Change and the Language of Geographic Place

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The Premise

As the scientific reality of global warming sets in across the planet, government agencies, non-governmental organizations and corporations at all levels are responding with ideas for projects, programs and policies which will reduce our carbon emissions. Policy strategies are being debated at the highest levels of government[1] and in many international forums, such as the United Nations Climate Change Conference in Copenhagen in 2009. All federal agencies, including the Departments of Energy, Interior, Agriculture and the Environmental Protection Agency have policies addressing global climate change and are actively adjusting their field programs.

The Union of Concerned Scientists in 2009 issued a report of their "blueprint" for addressing global climate change.[2] It sets forth policies designed to meet a variety of targets for the reduction of greenhouse gases. Missing is the social component, a critical aspect of any policy process that recognizes the current practices of everyday citizens in dealing with climate change. The social component that recognizes citizen based stewardship as necessary to addressing climate change consistently appears to be "beyond the scope" of works such as this 2009 report, as well as the many federal programs that only recognize a top down solution to be considered. This top down bias ignores the essential success that a bottom up approach can provide.[3]

Sensitivity to local geographic living conditions and to place-based language people use to describe their current individual practices to increase carbon-free livability is vital to increasing citizen participation in these large-scale policy initiatives. A central challenge for a new approach to global warming is the creation and integration of scientifically-valid and

[1] Lizza, Ryan "As the World Burns: How the Senate and White House Missed Their Best Chance to Deal with Climate Change, The New Yorker, October 11, 2010, pp. 70-83.
[2] Union of Concerned Scientists, "Climate 2030: A National Blueprint for a Clean Energy Economy," May, 2009.
[3] Although key officials in Virginia dispute climate change information and resist climate change policies, residents in Norfolk, at the mouth of the Chesapeake Bay, routinely struggle with and work against rising tidal streams on three sides ("Front-Line City in Virginia Tackles rise in Sea" New York Times, Science Section, November 26, 2010)

culturally-appropriate policy strategies for addressing carbon emissions. If we as a global society are unable to link the formal institutions with the informal systems of communities concerned with survival and caretaking, the policy choices will by default become regulatory, draconian in their consequences, high in political and monetary costs, and limited in their effectiveness.

In this chapter, a human geographic issue management system is described to honor what people are already doing in their local areas to address climate change. Building programs and policies from a human geographic perspective as a means to enhance success is illustrated through a unique mapping technique. We discuss the limits of top-down initiatives and how honoring and using the language of place is the key to implementing a grassroots initiative. An implementation model that has been successful in other settings is discussed through illustrating the six scales of human geographic mapping that can be used to aggregate action from the neighborhood to the global level. Also discussed is why initiatives that build on action begun at a local level permits successful aggregation to higher levels in order to create healthier societies and a healthier planet. Finally the conceptual framework and methodology of applied social change is presented as capable of fostering citizen-based ecological stewardship that leads to empowerment and mobilization to participate in the changes embodied in emerging carbon-free policies.

The Limits and Risks of Top-Down Initiatives and the Importance of the Language of Place

Just as the energy picture varies by geographic region[4] in terms of energy demand and development choices, so the solutions to global climate change are also geographically-based. Accounting for cultural factors in designing climate change policies means that policies will be unique in each human geographic region. For example, in an effort to reduce air emissions, Mexico City in 1989 copied U.S. strategies including "no drive days" determined by the last digit of the license plates. While the policy was intended to encourage people to take the Metro, instead wealthy people bought older second cars to drive on restricted days. These cars were usually more polluting, thus adding to the air emission problems.[5] Instead of importing programs from elsewhere, policy makers should learn the local issues and how they are managed by citizens in order to incorporate these cultural practices into policy directives to avoid unintended consequences.

The current crop of global climate change initiatives derives from a failure to understand how social change actually takes place. To understand social change, two systems in society are recognized: the formal and the informal. The formal world is made up of organizations and self-interest groups that are politically, ideologically and economically oriented, while the informal world is made up of individuals and families who must survive on a day-to-day basis, take care of each other, and maintain their culture in a geographically-defined area.

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[4] Lizza, ibid, p. 72

[5] Bohren, Lenora, "Car Culture and Decision-Making: Choice and Climate Change," IN Anthropology and Climate Change: From Encounters to Actions, Crate, Susan A. and Mark Nuttall (eds), Walnut Creek, CA: Left Coast Press, 2009, pp. 370-379.

Al Gore's internationally-acclaimed research and presentation of the documentary, An Inconvenient Truth, pulled the disparate parts of various quantitative and qualitative sources of information on the warming of the globe into a comprehensive package generating a consolidated focus. Advocates were then trained to take the package to go and sell the idea of climate change to the masses. At some point in that selling process, a shift needed to occur, a shift from just a centralized approach of imposing the idea of climate change, generally using scare tactics, to a decentralized, more balanced face-to-face human scale approach. The decentralized approach could have engaged citizens to discover the elements in their own lives and environments that were of specific concern to them regarding the effects of the warming of the atmosphere. A base would have been built as people discovered what they were currently doing individually in their daily lives that affected the issue of climate change. Because this shift did not occur where citizens could become involved from their own experiences, and defend their experiences to a wider public, the door was open to skepticism and suspicion about the scientific validity of climate change generated by particular political interests at the national level. Had citizens owned the climate change issue by that point, the subsequent disinformation campaign would not have been nearly so successful.

A shift of major proportions will soon have to take place in the centralized narrative and organizational structure to one of engaging the American people in addressing their "self-interest" in this issue at the neighborhood, village and community levels of society. For instance a McClatchy-Ipsos poll in December of 2009 indicates the following:

- 70% of Americans think global warming is real;
- 61% think that it is happening because of the burning of fossil fuels;
- 69% support Cap and Trade legislation, even if it costs them $10 a month more, as long as it creates a "significant" number of American jobs.[6]

Note the language in this poll that taps one of the informal grassroots issues: *"creates a significant number of American jobs."* Policy makers engaged in formal "top-down" approaches do not seem capable of recognizing the ability to grow an issue from the bottom-up. American jobs are the central focus of the citizens and that has been lost in arguing the ideology of cap and trade.

Explanatory science often is a trap to social action because it is based on "imposed rational" thinking. Imposed rational thinking is recognition by the scientist that the truth has been found and, since it is true, then the recipient should recognize it as such and act accordingly. Thus communication is conceived as one-way: If the scientific facts are known, it is assumed that people will act accordingly and change their behavior to align with the facts. By only using a formal approach where there is no interface with the language and geography of a community allows for the issue to be polarized at very high levels, where dueling scientists and political pundits take ideological control of the issue.

[6] "Poll: Most Americans Support Climate Change if it Creates Jobs," McClatchy-Ipsos Poll, December 10, 2009, Dallas Morning News.

The Food Industry and the Grassroots Movement

A good example of a movement where a shift has taken place is with the food industry and the grassroots citizen demands that the food industry change its ways of producing poultry, beef and pork. Citizens began their movement with a central theme of "factory farms," which was a grounded, more effective way of tapping into and using local language than "climate change." Using the term "factory farms" allowed a contrast with the term "family farm," a visual image with which ordinary Americans could identify— a pastoral image of family farms and the lifestyles of farmers as exhibiting solid American values of hard work and taking care of family, neighbors and community. The visual image of "factory" is one of mass production, and with a few well-placed pictures and statements, the image of "factory farms" began to include meanings of inhumane treatment of animals and unhealthy outcomes for humans.[7]

From this beginning, the movement concentrated on geographic areas where factory farms were prominent and could easily be viewed and documented. Local individuals could be engaged in making the discoveries of the unhealthy conditions of these so-called farms. Once individuals were engaged in documenting the conditions, they spread the word of their activity through their own informal networks.

Communication within informal networks moves horizontally and is highly reliable and effective since peers are communicating about their experiences. Over time this physical manifestation of the factory farm began to take hold in the public mind. Because of this geographic grounding, the issue began to push upward. In the meantime, organic farming and organic farm produce outlets began an exponential growth curve, with farmers markets and local entrepreneurs leading the way, culminating in the Whole Foods phenomenon of profitable corporate respectability. The issue was now grounded in hundreds of geographic settings nationwide. Once an issue is embedded in the culture, it has its own life and momentum and needs little advocacy to continue to grow. It just "is."[8] In December of 2010 the congress passed a law that enables the Food and Drug Administration to order recalls of contaminated food items instead of having to rely on the good will of the producers.

In 2009, the documentary Food, Inc. came out and had a revolutionary impact on the public because an up-from-the-bottom cultural movement aligned with the scientific facts gathered in the formal systems. The confluence that took place when the informal met the formal is having profound implications.[9] It had this impact because the citizen ecological stewardship base of the movement had become concerned with the issue through their own discoveries, aided by their own ability to network with their neighbors and friends, over their own specific discoveries. The thousands of farmers markets became the main gathering places

[7] "Pollution" is a word that the American people have come to understand as dangerous and damaging to one's health and livability. It is a well-grounded word in almost all geographic language uses, yet it did not find a core use to be built upon by climate change advocates.

[8] The "is" theory was first expounded by Ed Ricketts, owner of the Pacific Biological Laboratory in a discussion about "breaking through." It is documented in the book by John Steinbeck, The Log from the Sea of Cortez, "About Ed Ricketts", page xii.

[9] Farmers and Activists Lean to a Truce on Animals' Confinement, The New York Times, Thursday August 12, 2010

where empowering information changed hands effortlessly every week. It is this explosion of farmers markets as a national phenomenon that is addressing one part of climate change. This provides a solid base from which to build from the ground-up a "cooling of the globe" movement.

Local language use in a geographic context is critical for citizens to mobilize in their own self-interest. Had the movie Food Inc. come out in the manner that Gore's film did, it would have had less impact because the people at the grassroots would not have had their own experiences, their own ownership, in their own language and geography, to connect with the issue.

The Missing Ingredients for a Social Movement

Climate change advocates have missed this important stage in constructing a social movement. To be successful any movement must eventually come from the "bottom-up" with people identifying and solving their own issues. With the "factory farms" case, there was eventually an aggregation of these thousands of multiple issues that matured into a national demand that the way our beef, pork and eggs are produced had to change. A threshold has been passed and the trend is now solidly towards more natural and local products and away from factory farms. What was discovered is that price was not the real issue, as argued by the factory farms. The real issues were the inhumane treatment of animals and food handling that makes one sick such as the salmonella egg recall in August of 2010.[10] This was aided by the consumers' respect for our small-scale family-centered rural heritage, and by direct association, with growers through farmers markets. Price was only a theme used for political purposes and ultimately it was not tied to citizen interests and was ineffective in blunting this movement.

This bottom-up movement materialized this year in the Food Safety Modernization Act that passed congress and was signed into law December 2010 by President Obama. This bill, fueled by massive grassroots support, is a major overhaul of the food-safety system giving the Food and Drug Administration (FDA) the authority to mandate recalls of tainted food the moment they are discovered. Before this act was passed the recall was voluntary on the producer's part. The bill also has many other provisions concerning food-safety plans, increases inspections of domestic and foreign food facilities, and required record keeping for farms and processors.

The fact of climate change and how it is viewed has to be modified in a thousand ways at the grassroots level in order to create the movement needed to be effective in addressing the warming of our planet. To understand how a grass roots level of action is supported, it is useful to visit a process that has been developed over the last 40 years known as Human Geographic Issue Management Systems (HGIMS). This process has been successfully applied to situations of social change in response to government and corporate change

[10] "Recall Expands to More than a Billion Eggs," Associated Press, August 20, 2010. The Food Safety Moderniazation Act's passing was aided by the serious outbreaks of E. coli and salmonella poisoning in eggs, peanuts and produce in recent years.

initiatives in numerous settings.[11] Fundamental to the approach is the proposition that the most effective way of fostering the sustainability and livability of communities is to align the beliefs, stories, traditions and practices that make up culture at informal local levels of society with the goals, the science, and the legal framework represented by the formal institutions which serve us.

An Implementation Model for Program and Policy Development Regarding Global Climate Change

The Human Geographic Issue Management System (HGIMS) is part of a well-developed theory and methodology of applied social change called Social Ecology.[12] Its full conceptual framework will not be outlined here. However, the heart of the system is four principles of Social Ecology:

Four Principles of Social Ecology

1. Social meanings of local language: As described above, geographic, cultural language is essential to connect with the social meanings of local people on the ground whose behavior is adaptive and already changing to meet the challenges of a warming globe. Capture the language that people are already using to address their self-interest in building and living healthier lives, and it will foster change in behavior as it affects climate change. Language reflects the culture of a geographic area and how people in that culture interpret the world. People are attuned to "pollution" and "fossil fuel independence" and are acting accordingly. When you talk to people in their gathering places you often hear them comparing notes on "more miles per gallon", how the weather seems to be getting warmer or colder, talk about how their gardens are doing and how great it is to eat their own vegetables, who has just bought a Prius—all language uses to build on.

2. Human Geographic Mapping: Human geographic mapping reflects the ways that human populations actually adapt and relate to their landscape. The section below details the rationale and the application of this concept in building a global movement of change in addressing climate issues.

3. The Social Capital of Sustainability: Informal network systems of communication and caretaking form the social capital by which communities sustain themselves. A truism of applied social change programs is that the programs must align with the culture to be

[11] Some examples include: 1) Development of a Social Impact Management System (SIMS) for the City and County of Honolulu, 1979-1983, population approximately 900,000. 2) Human Geographic Issue Management System for natural resource managers in the southern Willamette Valley, Oregon, 2001, population approximately 800,000. 3) A Regional Social Assessment of eastern Washington for the Spokane District of the Bureau of Land Management, 2010, approximate population of 700,000. 4) Building support for the Denver International Airport in Adams County, Colorado through the Discovery Process in a complex permitting environment, 1989. 5) Town of Basalt, Colorado, Governance by Social Capital as operating principle for town government, 2005-09. 6) Washoe County, Nevada, an Issue Management Program, 1990-1991.

[12] Preister, Kevin and James A. Kent, "Social Ecology: A New Pathway to Watershed Restoration." in Watershed Restoration: Principles and Practices, by Jack E. Williams, Michael P. Dombeck and Christopher A. Wood, Editors. Bethesda, Md.: The American Fisheries Society, 1997.

effective. Public initiatives designed to mobilize people to participate in solutions must work within these informal systems in order to reach people through their own cultural mechanisms.

4. Emerging Issues: Citizen issues develop from the adaptation of individuals to a changing environment and they represent actionable opportunities for agencies in collaborative relationships. Citizen issues are statements individuals at the grass roots make which are actionable. They predict the sources of social action at the informal level of society. In contrast, management concerns derive from formal institutions. While they are equally legitimate, it is the citizen issues which are often missed because informal systems are usually invisible to advocacy or special interest groups.

Discovering and Learning Community

The central methodological tool of HGIMS is The Discovery Process.™ The Discovery Process is a qualitative research method to understand an area as local people do by entering the routines of the community and describing it directly, with no preconceived filters, biases or assumptions—what we call a disciplined stranger. It involves using seven Cultural Descriptors to provide a holistic and comprehensive view of community life—settlement patterns, publics, networks, work routines, support services, recreational activities, and geographic features.[13] Description is a critical step and one which is either missed or implemented too late by organizations which are tempted to rely on shortcuts, such as census information or interviews with local elected officials. If change agents do not understand how residents in a community currently function, how individuals maintain their culture, and solve life's challenges, they cannot foster change that makes sense to everyday people. In this case, formal initiatives will be treated as outsider imposition and resisted by citizens, even though authority figures may say the initiative is in their own best interest, a term often associated with colonial control over a population.

To gain this perspective of learning community, a descriptive approach is pursued where the observer participates in daily routines of citizens in their geographic setting, asking naïve questions to elicit stories of place, assessing how communication occurs and who is well-regarded among their peers. The cultural mechanisms by which people come together and accomplish projects for the common good, and the current citizen issues with which people are grappling, are identified.

As part of the Discovery Process, human geographic mapping identifies the natural borders within which the various cultural elements of society function, whether it is a neighborhood in Boston or villages in the Sudan. People everywhere develop an attachment to a geographic place, characterized by a set of natural boundaries created by physical, biological, social, cultural and economic systems. This is called a Bio-Social Ecosystem. The term was created in 1991 by James Kent and Dan Baharav to integrate social ecology and biology in

[13] Kent, James A. and Kevin Preister, "Methods for the Development of Human Geographic Boundaries and Their Uses", in partial completion of Cooperative Agreement No. 1422-P850-A8-0015 between James Kent Associates and the U.S. Department of the Interior, Bureau of Land Management (BLM), Task Order No. 001, 1999.

addressing watershed issues with people being a recognized part of the landscape.[14] Unique beliefs, traditions, practices and stories tie people to a specific place, to the land, and to social/kinship networks, the reflection and function of which is called culture.

The Six Scales of Human Geography

Six different scales of human geography have been discovered, as shown in Figure One.[15] Operating at the proper scale brings optimum efficiency and productivity to projects, programs, marketing, policy formation and other actions by working within the appropriate social and cultural context. The chart begins with the individual in the center and moves outward from there through various aggregations from the neighborhood level and ending in a global unit.

1. Neighborhood Resource Unit (NRU)
2. Community Resource Unit (CRU)
3. Human Resource Unit (HRU)
4. Social Resource Unit (SRU)
5. Cultural Resource Unit (CuRU)
6. Global Resource Unit (GRU)

Human geographic mapping allows the cultural elements present in each area to be brought to bear to foster action on the ground. It allows, first of all, a recognition that there will be regional differences in the policies and programs designed to ameliorate global climate change. The heavily-forested regions of the Pacific Northwest will contribute in different ways to climate change initiatives than the deserts of the Sahara, the jungles of Borneo, or the outback of Australia. However, this point applies to the very local level as well. That is, successful climate change policies depend on having healthy action at the individual, neighborhood, community scales on up to the global scale. Action is thus aggregated from local to global, all anchored to appropriate cultural approaches at each scale.

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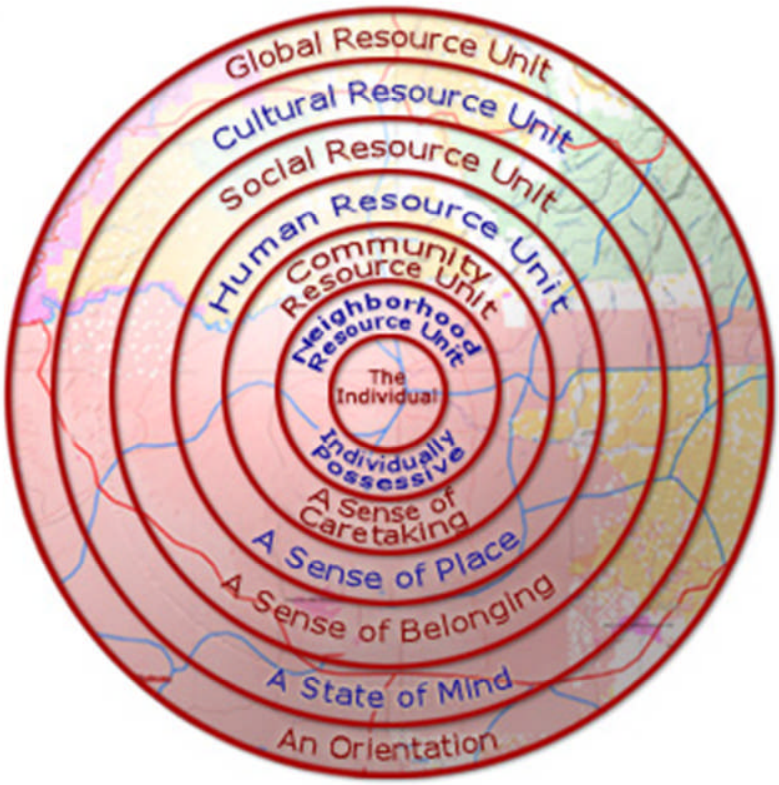
[14] Kent, James A., "Eco-Mapping: Planning and Management of Bio-Social Ecosystems." Boulder, CO: Thorn Ecological Institute (with Dan Baharav), 1991. The first Human Geographic Maps (HGMs) came into existence in the late 1970s and early 1980s as part of JKA's work with the US Forest Service, Region 2, Forest Planning process. The USFS was looking for new and creative ways to assist citizens to empower themselves in using forest planning to ensure the health of the lands and their communities. The HGMs were published as an integral part of the Forest Plan implementation. This was followed in 1986 by a contract with the US West (now Quest) Corporation to map the 14 states that made up their service area in order to launch their cell phone business based on cultural word-of-mouth and natural boundary systems. In 1995, the Bureau of Land Management (BLM) signed a thirty-year license agreement for the use of human geographic maps for planning and management purposes. Subsequently the HGMs have been used by communities, businesses, corporations, governments and citizens to improve relationships, make trend projections, develop market segments, and to understand emerging patterns in order to improve the way government and business is conducted.

[15] Quinkert, Anthony K., James A. Kent, and Donald C. Taylor, "The Technical Basis for Delineation of Human Geographic Units, Project Working Paper for USDA/SBIR Project Grant #85-SBIR-8—0069, April, 1986. Available at: http://www.naturalborders.com/Docs/Technical-Basis-for-Delineation-of-Human-Geographic.pdf. This research, supported by the National Science Foundation, sought to find quantitative counterparts such as zip codes or phone calling areas, to the qualitative Cultural Descriptors outlined in this paper but strong correlates were not found. Hence, shortcuts are unlikely, requiring policy makers to employ a descriptive approach in understanding the cultural lifeways of people affected by their policies.

Figure One:
Six Scales of Human Geography



Second, because the maps represent the ways in which people actually relate with and use their landscape, any initiatives that match the boundaries will be more effective than initiatives that are laid over the landscape according to political jurisdictions. Change programs that "match the culture" are incorporated into everyday routines of people in their communities and they are effective. Programs which do not grow from the culture are interpreted locally as being imposed from the outside and are resisted by citizens regardless of their scientific merit. This is the trap of imposed rational thinking.

A cultural approach in developing policies and programs intended to address global warming permits decision-makers to avoid the dangers of a strictly regulatory approach. It is not that regulation will not be part of the response to global warming but it should not be the first policy choice, nor is it applied universally but is targeted by geographic area according to local conditions. When the State of Oregon salmon recovery plan was developed in the 1990s, it explicitly recognized the fiscal and political limits of regulation. Then-Governor Kitzhaber made public statements that if Oregon residents did not voluntarily want to restore salmon habitat to enhance salmon's numbers, no amount of regulation would accomplish the objective. Rather, it is the behavior of individuals, families, and institutions that change voluntarily because they are aware of the issues and they want better conditions for their environment and their community. Policies have to recognize cultural elements and

create incentives for people to change behaviors at the local level. In the following pages, we will show how citizen action is maintained at each scale of human geography, pointing to the way that climate change policies in the future can be effectively implemented.

The Application of Human Geography to Climate Change

The individual at the center of the bull's eye in Figure One is the main adaptive unit of society. The individual acts in an empowered way, that is, desires to participate in, predict and control his or her environment in a manner that does not exploit others.[16] It is at this level where people make commitments to create a livable and healthy environment which includes the use of alternative energy, gardens, Growing Domes (geodesic domes within which to grow food)[17], creating pedestrian-centered communities, insulating homes and retrofitting them to reduce dependence on fossil fuels.

To the degree that the smaller circle is healthy and creative is the degree that aggregation will work at the next level, that is, action can move outward to the Neighborhood Resource Unit where caretaking of each other and sharing through informal networks take place. This phenomenon is both measurable and a way to direct social action. The next level is the Community Resource Unit which is an aggregation of the action at the neighborhood levels. Action at this scale creates project level self-sufficiency programs that benefit the whole community and builds towards a "tipping point" that a cultural shift from fossil fuels to alternative energy is taking place. Community Units aggregate to the Human Resource Units which are larger cultural zones including several communities. At the Social Resource Unit level are the several Human Resource Units that make up the sense of belonging at this larger scale of interaction. From aggregation of the Social Resource Units is created the regional Cultural Resource Unit and from there is created the Global Resource Unit.

To illustrate the above discussion, we will use the community of Carbondale, Colorado to show how healthy activity at each scale of human geography generates "grounded" action at higher scales.

The Neighborhood Resource Units of Carbondale, Colorado

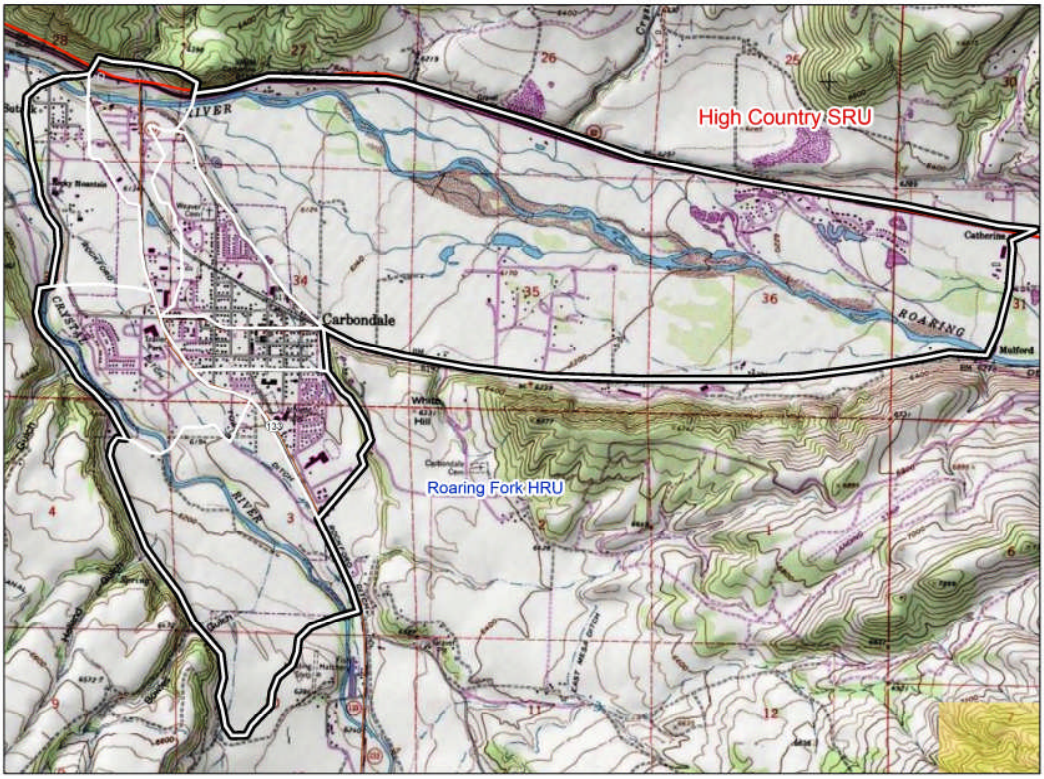
Figure Two shows the Neighborhood Resource Units (NRUs, shown in white) in the Community Resource Unit of Carbondale, Colorado. At the neighborhood level, the use of composting, growing organic gardens, xeriscape lawns and individual solar collectors is evident. Over the past three years, 8-12 dozen buildings in Carbondale have installed photo-voltaic (PV) or Solar Thermal collectors. This has been facilitated by State Amendment 37 which requires investor-owned utilities to produce 10% of their electricity from renewable

[16] Preister, Kevin and James A. Kent, "Clinical Sociological Perspectives on Social Impacts: From Assessment to Management, Clinical Sociological Review, Vol. 2, pp. 120-132, 1984, p. 125.

[17] One of the main reasons Puja Dhyan Parsons and her husband Udgar Parsons started Growing Domes™ 20 years ago was to support others who want to live sustainable, healthy lives. The company's innovative growing domes demonstrate a solar self-sufficiency that keeps fresh food on the table, even within the challenge of environmental and economic changes. In 1995, the company relocated to Pagosa Springs, Colorado where they remain today. In 2010 they won the Colorado Business Award as one of the top 50 companies to watch.

sources by the year 2015.[18] Utility and local rebates and tax credits have considerably reduced the retail cost of purchase and installation. Small businesses are emerging to meet this demand. There are many early adapters among the citizens who began their "energy independence" journey during the Carter Administration and they have flourished and assisted their neighbors in adapting to being more self-sufficient in becoming free of oil dependence.

Figure Two
Neighborhood Resource Units (NRUs) within the
Carbondale Community Resource Unit (CRU)[19]



Community Resource Units of Carbondale, Colorado

The Carbondale CRU (black lines in Figure Two above) is an aggregation of the NRUs. It is at this level that a confluence of energy takes place where neighborhood efforts are optimized to the broader community. Carbondale is known for a number of citizen and town government actions related to climate change and sustainable ecology. Many of the informal leaders in the social, economic and cultural conversion of Carbondale to reduced fossil fuel dependence got their start with the renewable energy programs of the President Carter administration in the 1970s. This has created an intergenerational absorption process

[18] "This is the first time in the Nation's history that a renewable energy portfolio standard was put directly before the voters rather than processed through a state legislature." Jesse Broehl, Editor, Renewable Energy.com, November 3, 2004, "Colorado Voters Pass Renewable Energy Standard."
[19] Human geographic maps provided by Monteverde Associates, Portland, Oregon, tavomonte@gmail.com.

where from these early starts a full-blown cultural phenomenon addressing the warming of the globe has taken place over the last 40 years.

The following are several of the actions that have been and are taking place:

- Third Street Center: Two members of the Board of Trustees for the Town of Carbondale initiated community discussions to brainstorm about the idea of converting a soon to be abandoned elementary school into a non-profit/arts center. Community members supported the idea and the Board of Trustees over two years negotiated a land trade with the school district to secure the elementary school building. Once the building was secured, a local team of citizens produced a strategy for redeveloping the school into a sustainable home for local non-profits and artists. The town contributed $150,000, and the citizen team secured $1.7 million from public and private entities. With a local bank participating that acted in the community's interest, the stage was set for the development team to transform the elementary school into the Third Street Center, which has energy efficiency improvements throughout the building, including the use of natural light, a variety of efficiency measures in mechanical and utility systems, and a 50kw photo-voltaic (PV) array on the roof of the structure. Currently, it is home to a variety of non-profits, including energy and environmental groups, artists and human service organizations.

- Power Purchase Agreements (PPA's) have allowed third parties to invest in PV arrays – a 50kw system on Town of Carbondale Recreation Center building and a 150kw array on property owned by the Colorado Rocky Mountain School, an internationally-known private school with a community focus for its curriculum. At the time of completion, this was the largest array in Western Colorado and at the opening ceremonies several state and national political figures, including the Governor, Senators and House of Representative members spoke and praised the effort.

- A budding grassroots effort of local activists, called Carbondale Economic Localization (CEL), are endeavoring to identify measures that can be taken to re-localize the Carbondale economy in the face of "Peak Oil" and the end of the cheap energy economy.

- Grassroots efforts are promoting organic gardening throughout the community. Residents developed a plan to create 200 garden plots on town-owned land. The existing community garden plots are so popular that it is said that someone has to die in order for a new person to get a plot. The citizens are expanding the plots for next year. A local restaurant, called "689" was one of the first in the nation to grow their own vegetables and other edibles that were incorporated into the seasonally- based menu. This restaurant is ranked in the top 100 in the nation.

- A grassroots group is centered on organic food, teaching life skills and building community. This budding group is raising funds to build an outdoor, community accessible, wood-fired bread oven at the Third Street Center in 2011. The idea it to have people learn to bake for themselves once again.

- The Carbondale Energy and Climate Protection Plan, available for review on the town's website (www.carbondale.com), sets aggressive goals for the direction of the community. This is only possible to succeed because of the absorption and adaption to healthier lives at the Neighborhood Resource Unit level.

It is clear that citizens at this level are empowered and see the next steps they need to take to improve their situation. Absent from local language is talk of global climate change. Instead the language of change is focused on taking care of their kids, making their community energy independent, the warming of Carbondale, changes in weather patterns that affect skiing and the Carbondale economy, and taking care of the senior people.

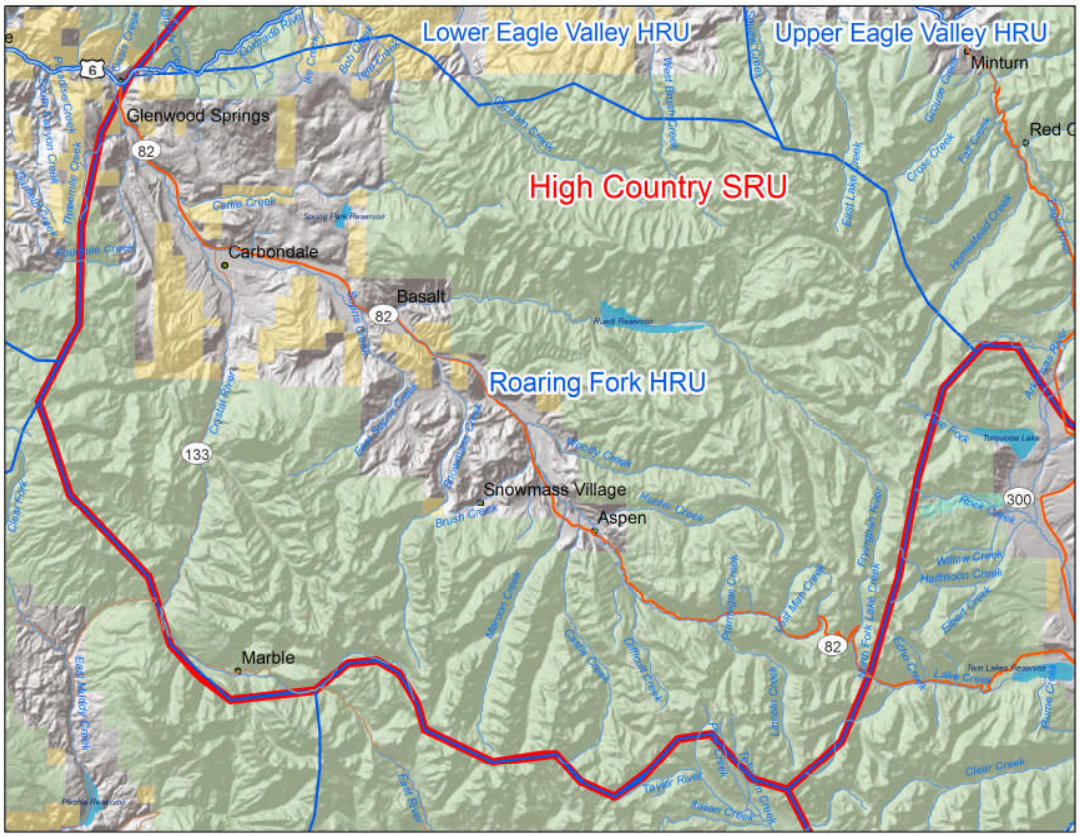
Human Resource Unit of The Roaring Fork

The Carbondale CRU is part of the Roaring Fork Human Resource Unit (HRU, Figure Three) which also includes the communities of Aspen, Snowmass, Old Snowmass, Basalt, El Jebel, Aspen Glen, and Glenwood Springs. Throughout the Roaring Fork HRU are renewable energy projects, some dating back to the 1970s such as the Rudi Dam that is a recreation and sports lake but also supplies electrical power to the city of Aspen. The Basalt community completed in 2010 an $11 million regional library that is state of the art and is 100% off of the grid. Farmers markets and community gardens are present in every community of the HRU. A Whole Foods store is considering its first smaller 20,000 square foot store, nationally, in mid-valley at El Jebel because of the people's commitment to healthy eating habits.

The Aspen Skiing Company is located in this HRU and has been a leader in renewable practices within the company and community. The Aspen Ski Company created a Vice President for Sustainability and is a leader in the fight for slowing down the warming of the globe which is part of their stated company objectives created in 2002. According to Auden Schindler the VP for Sustainability, if you do not have snow, there is no ski industry. This global commitment is the first of its kind among international ski corporations.

A Carbondale-area group of designers, planners, architects came together with a vision to create examples of carbon neutral development and redevelopment. Calling itself the Sustainable Center of the Rockies (SCOR), the group originally put a five-acre property under contract to build a model building/facility/campus. They held a community charrette to gather input on how to proceed and what type of facility the community wanted to build. The community responded with a variety of ideas about what a facility like this could be. However, the most important input to SCOR from the community was that it would be more sustainable to adaptively reuse an existing building rather than undertake "greenfield" development. Additionally, if SCOR could create a sustainable building, which currently existed, then that would provide valuable knowledge for the entire man-built environment. SCOR was instrumental in conceptualizing the Third Street Center design and now provides consultation to groups and governments throughout the HRU, the State and Rocky Mountain region.

Figure Three:
The Roaring Fork Human Resource Unit (HRU)



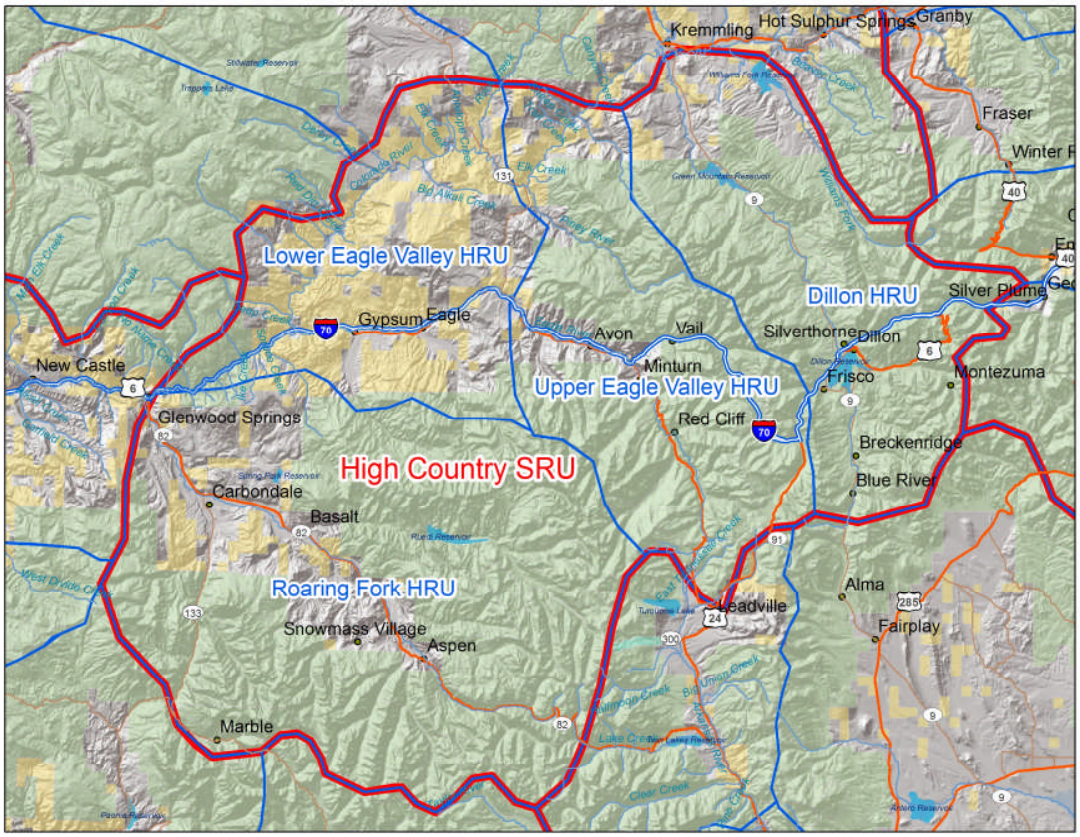
Renewable concepts and practices have become intergenerational with stories of how the families got going with renewable processes and how those were handed onto their kids and now grand kids. The people of this Roaring Fork HRU are full participants in alternative energy to free our nation's dependence on fossil fuel.

Social Resource Unit: The High Country

The High Country SRU (Figure Four) contains the major winter recreation sites in Colorado. It includes Dillon, Frisco, Breckenridge, Vail, Beaver Creek, Minturn, Eagle, Gypsum and Glenwood Springs. It includes four HRUs: Dillon, Upper Eagle Valley, Lower Eagle Valley and Roaring Fork.

There are several major ski areas in this SRU including Loveland, Copper Mountain, Vail, Beaver Creek and Aspen. Following Aspen Ski Company's leadership, the other ski areas are joining the effort to address climate change on the national and global level. In addition, the U.S. National Forests are major players at this SRU level since skiing and other recreational activities depend on formal permits and informal collaborative agreements on using forest resources to create a sustainable future. Extraction of resources is no longer the dominant focus, having been replaced by uses that lead to renewability. The people in this area are very outdoors-oriented and they are invested in environmental quality, in part because their

Figure Four:
The High Country Social Resource Unit (SRU)



livelihood stems from quality of visitor experiences. A number of energy and environmental groups that began as citizen movements formed organizations and are now providing expertise throughout the SRU. The citizens developed the ideas and local governmental units facilitated with funding. These include:

- CLEER (Clean Energy Economy for the Region) works to accelerate the transition to a clean energy economy, increase energy independence and reduce impacts of climate change. CLEER was started by a group of concerned citizens who have worked to help governmental entities implement transportation, energy efficiency and renewable energy strategies in the region. CLEER continues to be a citizen-based group and while some elected officials sit on the Board of Directors, there is no formal tie to any government.

- G-NECI (Garfield New Energy Communities Initiative) was started by CLEER and is now a formal part of the region's government. G-NECI was formed through a 9-party Intergovernmental Agreement (IGA). The IGA is comprised of Garfield County and the municipalities in Garfield County, Roaring Fork Transit Agency and Library District. G-NECI has raised funds through local governments and the state and is now implementing a county-wide energy efficiency/renewable energy strategy.

G-NECI's Board of Directors is comprised of representatives from all the participating entities. CLEER is under contract to manage G-NECI's projects.

- CORE (Community Office for Resource Efficiency) has been in existence for over 15 years and is funded by the city of Aspen, the town of Snowmass Village, Pitkin County and Holy Cross Electric (a locally consumer owned electrical cooperative). The bulk of CORE's funding comes from Aspen and Pitkin County exactions for energy impacts from new construction. CORE funds a variety of energy efficiency and renewable energy projects in the valley. CORE's Board of Directors is made-up of representatives from its sponsor group.

The activities in this SRU can be seen to be occurring in other SRUs throughout the U.S. West.

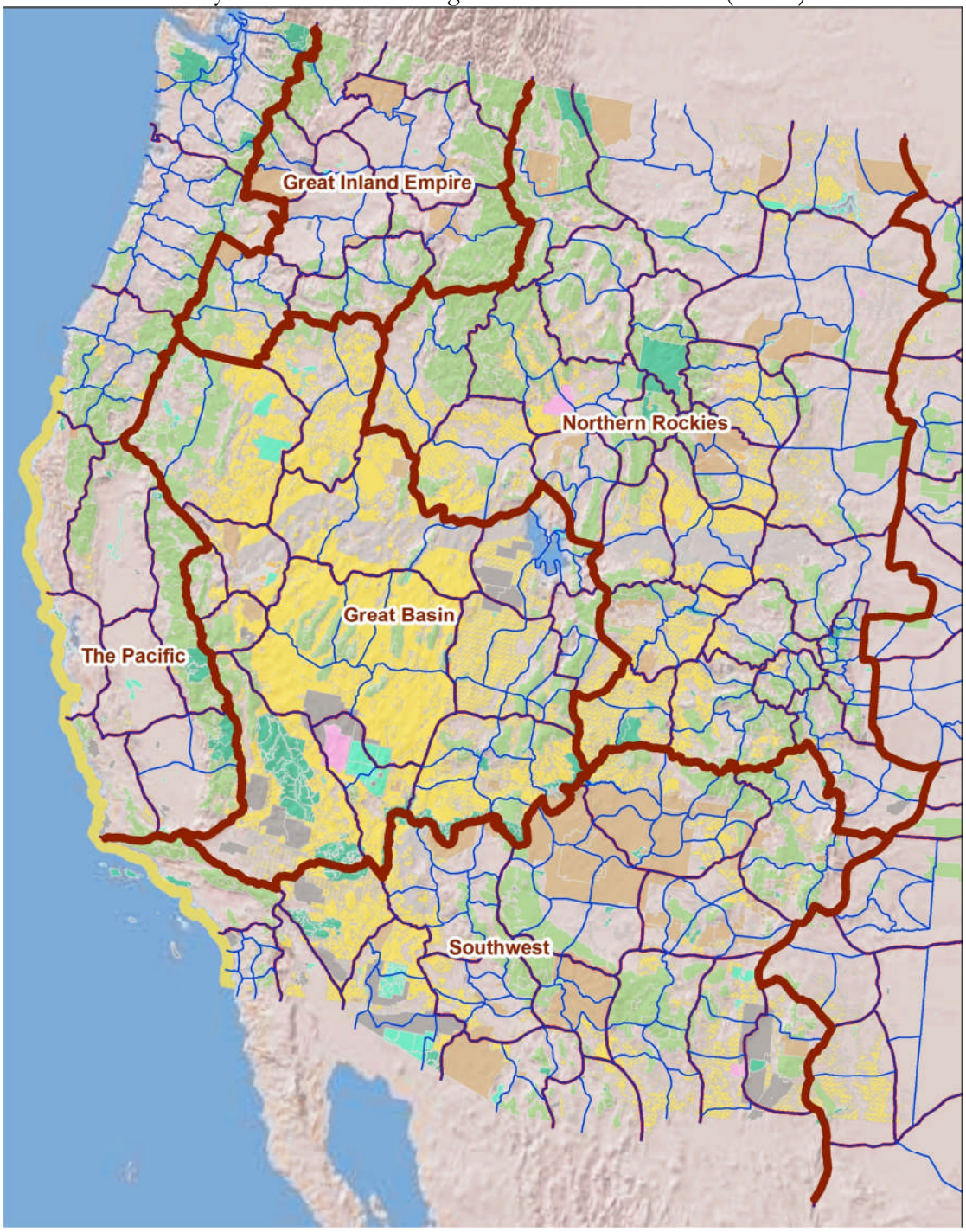
Cultural Resource Unit: The Northern Rockies

The High Country SRU is embedded in the Northern Rockies Cultural Resource Unit (CuRU, Figure Five) which includes Colorado. The National Energy Laboratory set up in Colorado thirty years ago had a major influence on developing professionals and intellectual capital for renewable energy development. This energy lab set the stage for attracting renewable energy companies to the Northern Rockies CuRU. Because of the action in different SRUs and the favorable climate for renewable energy, manufacturers of wind machines have begun to set up in Colorado. Recently the United States headquarters of the international company, Abengoa Solar, founded in Spain in 1941, has been established in Lakewood, Colorado. This company is planning solar projects throughout the U.S. Southwest.

The State of Colorado through a citizen referendum passed Initiative 37 which stipulates that 10% of its energy must be from renewable sources by the year 2015. A confluence occurred as a result of this legislation. Because there has been a bottom-up building of a culture for sustainability there was widespread support for this action. As a result Xcel Energy made the first major move as a regional energy company to convert from coal generation to natural gas. This has sent shock waves throughout the coal industry as this is the first conversion to cleaner fuels announced by an energy provider in the Northern Rockies CuRU. Xcel also has projects with Abengoa Solar for other projects that will reduce dependence on fossil fuels in this CuRU. That point should not be missed that changes at this level have been made possible because of the actions taken since the 1970s by people at the neighborhood, community and regional levels.

Other activities at the cultural unit level that are getting traction are Bark Beetle coalitions formed to deal with millions of acres of standing dead Lodge pole Pine. Incubated in Breckenridge, Colorado collaborative efforts to address this ecological disturbance that has affected the entire cultural unit are now wide spread. Senator Mark Udall has passed legislation to provide funds to the U.S. Forest Service, Region 2, for treatment in areas affected by the bark beetle infestation.

Figure Five
Social Resource Units (SRUs) of the
Rocky Mountain Front Range Cultural Resource Unit (CuRU)



In Aspen, a citizens group called For the Forest, has organized a collaboration between private land owners and the U.S. Forest Service to clear beetle kill pines from Smuggler Mountain, a specially-protected area in the Roaring Fork HRU. This citizen-initiated effort did not wait for the federal government to develop this program. It was started by an ex-mayor of Aspen, who was a leader in the 1990s in renewable energy. The program is in its very successful second cutting using helicopter technology to "be light on the land."

Two ex-US Forest Service professionals working as consultants for the Salvation Army in Haiti, contracted with a Montrose , Colorado wood mill to produce lumber and pre-fabricated units from the standing dead beetle kill pine. They have used this standing dead timber to build over 600 emergency shelters in Haiti after the earthquake, with plans to build 4,000 more.

Finally, the Governor's Energy Office recruited one of Carbondale's community and energy activists to spear head state wide renewable energy projects. This person worked for CORE in the Carbondale office and was responsible for many of Carbondale's local initiatives. She now travels around the west slope of Colorado assisting communities in the energy arena. She represents a vital link to the Governor's office and can maintain two-way communication across the six human geographic scales.

The high level of National Forest and Bureau of Land Management land ownership contributes to the renewability surge in this cultural unit. It is interesting to note that throughout the cultural unit are a high number of Prius automobiles. It is claimed that there are more Prius cars owned, per capita, in this CRU than anywhere else in the U.S.

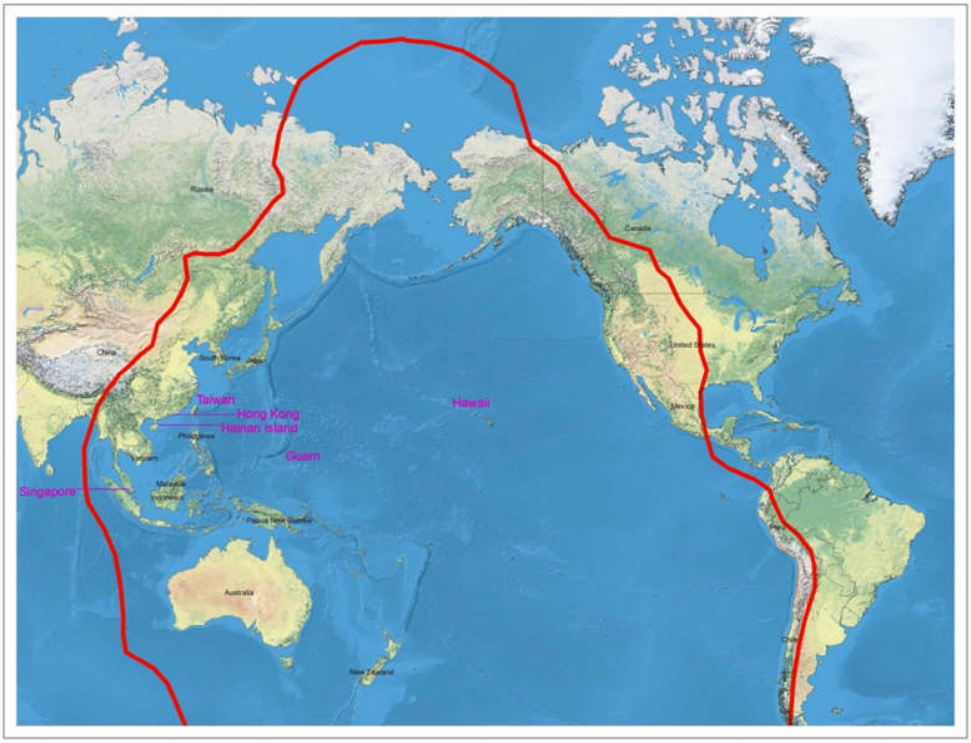
Global Resource Unit: The Pacific Rim

Figure Six shows the aggregation of different human geographic units into a Global Resource Unit (GRU) called the Pacific Rim. At the global level, it is clear that new job creation in renewable energy, especially for manufacturing in areas such as windmills and solar cells, presently is shared between China and the U.S. side of the Pacific Rim GRU. Our side of the Pacific Rim needs to create more capacity for renewable energy manufacturing. Manufacturing of wind blades and towers needs to be developed close to the geographic place where they will be used. While technology can be shared across boundaries, local and regional capacity needs to be created for social, cultural and economic ecological reasons. For example, a successful electric motorcycle manufacturer, located in Ashland, Oregon, has spent years developing the technology and getting the necessary patents. Now that it is ready to go to production, lack of local production capacity has forced them to sign a contract with an electronics manufacturer in Singapore.[20]

There is much effort to be expended to make this GRU work for its North and South American components.

[20] "Brammo's Bikes Go Global," Medford Mail Tribune, September 23, 2010.

Figure Six
The Pacific Rim Global Resource Unit



Enter Citizen Based Ecological Stewardship

In summary, knowledge at a local level—of the lifestyle routines, the cultural practices, and the innovations—can be incorporated into an implementation model to foster behavioral changes needed to address climate change. Human geographic mapping, especially, offers a powerful way to conceptualize and mobilize for the necessary changes.

At the neighborhood and community level, individual and family change can be observed, identified and supported. For climate change projects, the Human Resource Unit is the appropriate human geographic scale at which to work, to avoid surprise, incorporate local knowledge, and build support. Knowledge of social trends at the HRU level allows projects to respond to them in order to optimize local social and economic benefits of projects. At the Social Resource Unit level, the maturing of organizational capacity and the incorporation of renewable paradigms will pay great dividends. At the SRU, CuRU, and GRU levels, manufacturing capacity, away from industrial applications and toward renewable applications, can be encouraged through actions such as Colorado Amendment 37 which establishes a time frame for renewable energy targets.

A human geographic issue management system (HGIMS) is a management process in which citizen issues are incorporated with management concerns to produce integrated action with shared responsibility for implementation. Actions are thus derived from both informal and

formal systems, creating "cultural alignment." When cultural alignment is achieved, programs and policies are able to be implemented with full citizen support and participation, lowering costs and improving effectiveness. The resilience of both systems is enhanced.

Policy-makers must be careful to avoid assumptions about how new initiatives will be received. Energy companies routinely promote wind energy as "clean energy," believing for that reason that wind energy projects will be supported. Despite the national rhetoric about the value of wind energy projects, they are being resisted by citizens at the project level throughout the country. For project proponents to revert to slogans such as, "It's that NIMBY-ism (Not in My Back Yard) rearing its ugly heard again" or "People are just apathetic and don't care" misses the point. These projects are failing because citizen issues are not understood and incorporated into project planning.[21]

Scratch below the surface of any geographic area in which humans live and you will find stories of place, of people attached to the land, to their place-based community and to kinship. Whether this rootedness is of indigenous people who have lived in a place for thousands of years or whether it is a new retirement community in the U.S., people adopt local place names, they learn the stories of the place and they learn about what it means to be part of their ecological setting.

Citizen-based stewardship is pervasive and prevalent throughout human society, reinforced in daily social practices. Even in highly degraded areas, individual and group efforts to take care of their land and ocean resources, as well as their communities and each other, can be observed and documented. When implementation models account for this powerful force, tremendous energy for change will be unleashed, creating a true partnership to "Cool the Globe." It is the language of everyday people, the language of hope and survival, that must become the basis for cooling the globe.

[21] Kent, James A., Kevin Preister, Trish Malone, Dan Wood, "Wind Energy Development and Public Perception," Right of Way Magazine, International Right of Way Association, May-June, 20098, pp. 32-35.

Biographic Statement of Jim Kent

Jim Kent is a global community organizer with extensive experience in successfully implementing bottom-up change processes based on informal systems. He is President of the JKA Group which has three enterprises: James Kent Associates, a public policy consulting firm; Center for Social Ecology and Public Policy, a non-profit that builds public policy from social ecological concepts; and Natural Borders, a human geographic mapping company. Jim has presented at hundreds of universities, policy forums, and conferences focusing on bio-social ecosystems, national environmental policy, policy formation and implementation, culture-based enterprise development and citizen-based collaboration. He has a Juris Doctors in Law and a Masters of Arts in Sociology.

Biographic Statement of Kevin Preister

Kevin Preister has worked for 30 years to foster citizen empowerment in areas ranging from urban redevelopment to water and recreation development. In the last several years, he has focused on natural resource management and has worked extensively with key federal agencies, notably the Bureau of Land Management, the U.S. Forest Service and others, to institutionalize management practices that reflect and build upon cultural practices and local routines. In both project work and through management training programs, both at home and abroad, Preister has assisted agencies in enhancing "productive harmony" between the human and physical environments by "working through the culture." He received his doctorate in economic anthropology in 1994 from the University of California at Davis and resides in Ashland, Oregon. He currently directs the non-profit Center for Social Ecology and Public Policy and is adjunct faculty with Southern Oregon University.