Discussion Notes
2011 WUN Scenario Planning Retreat
Friday Harbor, Washington
September 7-10, 2011

9.9.11 Thursday Afternoon Session:

Climate Justice Lightning Talks
What could we see happen in the next 50 years?

Health

- Several well-recognized health impacts related to climate change:
  - Heat waves
  - Air pollution
  - Increase in diseases (airborne + waterborne)
- Food scarcity – malnutrition
- Women's + children's health
- Justice / equity (most vulnerable → least responsible)
- (1) Lack of preparedness / lack of health infrastructure
- (2) Variability of adaptation response plans + potential for co-benefits[1]
- What are areas of co-benefits – short-term gains of mitigation strategies, scenario analysis of responses?
- Scale matters: we've failed at international and national levels; we need regional and metro area planning
- Population displacement – violence, mental health impacts (could = iceberg under tip of iceberg)

Food

- Increased temperatures, lower yield (we can expect to lose about 10% for every one degree Celsius rise)
- Heat stress on plants
- Respiration depletes photosynthesis
- Difficult to breed for
- Agriculture is often main source of income or food
- 20% or more reduction in yield by 2050 (between 35° North and South)
- Pests

[1] These two issues may have the largest impact with the widest range of uncertainty & therefore they may not be the most ripe for scenarios (e.g., CO_2 mitigation options via "Green Cities" could affect air quality and physical fitness to an extent that could far outweigh specific climate change health risks).

    - In tropics ~ 10% reduction due to pests, numbers 10-50% by 2100 (in higher latitudes)
    - $10-20 billion in damage on just maize in U.S.
- Lack of access to food
- Lack of availability of food
- Land grabs for agricultural security
- Food vs. biofuels
- Push for GMOs
- Food riots + nationalism
- Legal conflicts over land contracts
- Connections between energy (biofuels), water, and food
- Land grabs = water grabs

Water

- Wet = wetter / dry = drier
- Extreme events increase (could be modest) – intensity and frequency of impacts
- Increased sensitivity of (and pressure on) water sector
- Water will be an opportunity for the adaptation of agriculture
- Competition between nations over water (water wars)
- New markets for water
- Generally warmer weather → increased pressure on agricultural systems
- Snow packs decrease
- Uncertainty in precipitation models
- Legacies of water quality

Security

- High pressure on resources
- Hotter → increased forest fires
- Higher sea level → higher erosion rates → diminished food security
- Food comes from outside, no more capacity locally
- Acidification = lower protein from fish
- Coastlines vulnerable due to erosion of reefs
- Population migrations → political problems
- More intense hurricanes and storm surges → danger to coastal communities
- Safety = free from molestation / Security = belief that you're safe
- Population migrations threatens existing countries
- Migration due to lack of resources / land
- Nuclear conflicts due to pressure
- How successful will current adaptation initiatives be?

Equity

- Broken social contracts → creation of equity groups
    - Poor people
    - Mobile workers

    - Men / Women
    - Victims of violence
    - People with reproductive health concerns
    - People impacted by nanotechnology
    - People with mental health issues
    - People with HIV/AIDS
    - Refugees
    - Young unemployed
    - Indigenous resource owners
- International inequities → conflicts incited by young (psychological weight)
- Poor adaptive capacity + weak governance = inequities in adaptation to impacts
- Those who are most at risk have least voice
- Intergenerational inequities → psychological despondency or even political chaos

Justice

- Environmental degradation is legal
- No prevention ethic or precautionary principle in U.S.
- No protections for climate refugees
- No protections for displaced Arctic residents (even in U.S.)
- No compensation or redress for impacted people
- No clear legal mechanisms for distributing climate $
- Climate laws are weak
- China is building more power plants (coal) + new pipelines (no law against this)
- Lack of law in all issue areas related to climate
- No framework for redress locally or internationally
    - Example: increased violence against women
        - Does local legal system offer means for redress?
            - See: Haiti's post-earthquake increase in rape
- No civil legal aid for migrants – ill-prepared
- Most responsible = least impacted
    - There is no justice framework for addressing this
- Can we hope for architecture of accountability?
    - Can we acknowledge responsibility?
        - Models: restorative justice; medical malpractice
        - How would this approach change the dialogue?
- Vulnerable communities do not own their resources → do not control their destinies / futures

<u>9.8.11 Thursday Evening Session:</u>

Story Circles

What does it take to make a hard choice that leads to a change for the better?

- Strength / Persistence

- Positivity / Optimism
- Humility
- Clarity
- Humanity / Human Relationships
- Greater Good
- Risk
- Transition
- Struggle / Challenge
- Compassion
- Intentional Decision-making
- Outside Influence / Life Context
- Core Values / Follow Your ♥

9.9.11 Friday Morning Session:

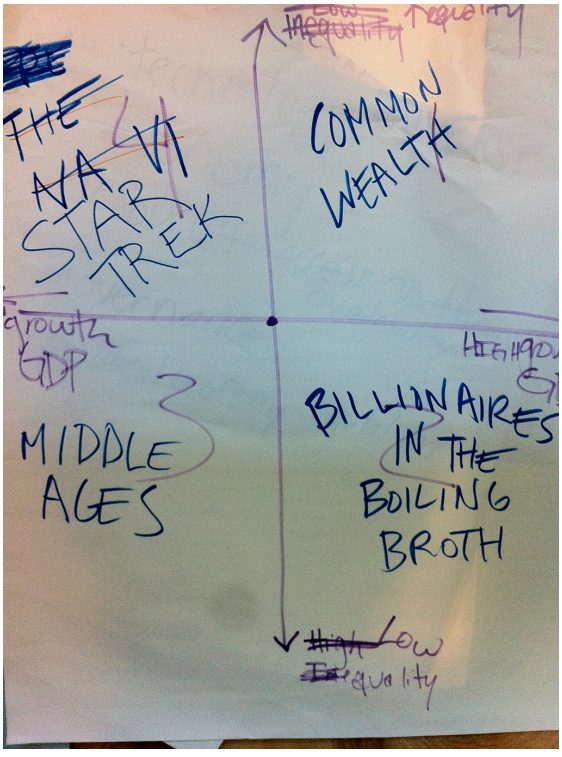
Brainstorm: What are our primary drivers of uncertainty?
Category prompts: *social, technology, economy, environment, and political*
(#) *Indicates number of dots from dot-voting exercise*

- *Growth (5)
- *Inequality (5)
- Technology access (4)
- Corporate power (4)
- Leadership (4)
- Energy sources (3)
- World view / Ideology (3)
- Empowerment, employment, and engagement of women (2)
- Total cost accounting (externalities / life-cycle analysis) (1)
- Decentralization vs. centralized governance (1)
- Technological innovation (1)
- Water
- Resource conflicts
- Cost of energy
- Poverty rate
- Trust in financial institutions
- Resource acquisitions / land grabs
- Land tenure
- Warmer climate
- Soil productivity and soil health
- Ocean acidification
- Change in land-use patterns
- Conservation
- Sea level rise

- Resilience of the environment
- Level of political isolation or cooperation
- Power of people
- Military – wars over environmental security issues
- Environmental refugees
- De-territorialized states / statelessness
- Geo-engineering
- Population
- Urbanization
- Education
- Fundamentalism
- Demographic shifts
- Health
- Globalization
- Social welfare
- Economic protectionism
- Privatization
- Key indicators shifting (GDP vs. Gross National Happiness)
- Global trade
- Subsidies

<u>9.9.11 Friday Afternoon Scenarios Session:</u>

Our Matrix



*** Please see all four group scenarios appended to the end of this document, followed by the compilation of all four compiled by Jen and Jen for the scenario exercise. ***

9.9.11 Friday Afternoon Session:

Post Scenario Open "Butterfly" Session
What questions are we left with?

- How do we deal with scale in scenario planning?
- How do we address the emotional impact of futures thinking?
- How will communities mobilize resources?
- How do we minimize social conflict?
- How do we turn risks into opportunities?
- How do we mobilize communities to feel empowered?
- What do we do about nuclear power?

9.10.11 Saturday Morning Session:

How can we apply these tools to climate-impacted communities?

- Multi-level scenario exercise, link scenario planning at different scales
- Putting together a toolkit of approaches, so that processes can be selected / customized for different communities
    - Be context-specific
- Keep trying different scenario planning forums, find method for climate change scenario planning that allows for more complexity than the two-axis forum
- Make sure scenario planning is used to simplify very complex things / issues, continue conversation about four retreat scenarios online
    - Corporate-sector scenario planning is not trying to address as complex an issue
- Continue conversation in another retreat?
- Important to maintain separation of four scenario
    - Four scenarios → four action plans
    - Look for actions that work for all AND identify indicators of which scenario you're in or where you're heading
- We get hung up on what we mean by "planning" – this is about "thinking"
    - Don't want to move into an actuarial tool, especially if we build a toolkit
    - Be careful not to "parachute in" to another field's space
- Know your goals
    - Teaching others to think about the future
    - Team-building
    - Action planning

- Be careful about talking about scenario planning process while scenario planning
- There is no body of literature on why facilitators make decisions, how the process was built, etc., but we could use that.
    - i.e., Northern Highlands resilience
- Come up with a dozen theme scenarios that would be familiar or useful in different places, so that communities could find one that is relevant
- How do you take scenarios → implementation?
    - Need resources, time, and commitment
    - In developing world, link scenarios to development plans
- Work with existing climate adaptation planning in countries and possibly use scenario planning with that?
- Scenario planning can help communities think about the future
- Go through climate scenario planning without mentioning "climate change"
    - Avoid emotional reactions to climate change
- At least be clear about interventions at different levels, careful not to be too open-ended
- It should not be the community's role to cross levels – we need boundary organizations to help bridge levels
    - Think of the International Research Institute
- Maintain transparency
    - Build easily accessible database with case studies about scenario planning applications or approaches
- Ask: what is a community capable of affecting?
    - They must be able to conceptualize scenario planning to focus on change that is possible for a given community to impact
- Build in goal of moving across scales → help communities engage with cross-scale dimensions
- Consider how communities think and work with their worldviews
    - We must really pay attention and listen to wisdom from the community

Appendix: Our Scenarios

Group 1: "Common Wealth"
Uncertainty: high economic growth / high equality

A world of greater democracy, equality, and prosperity driven by steady economic growth and innovative technological development.

Over the course of the first half of the 21st century, new technological innovations fueled broadly shared prosperity around the globe. Town X shared in this global boom, its location and natural resources providing fuel for a local energy transformation and investments in technology like solar farming. Increasing prosperity yielded increased social outcomes, helping many low-income individuals move out of the slums and into the mainstream economy.

But progress always brings in its wake new challenges. Rising temperatures continued to place pressure on traditional indigenous farming communities, moving more and more people into the community and maintaining social and economic stratification; that is, the slums remained full despite overall improvements in economic and social outcomes. Meanwhile, in the late 2020's, tensions with the neighboring country over transboundary water usage nearly led to an outbreak of military conflict. However, in parallel, shared prosperity in the region had encouraged the rise of a shared governance structures. The Regional Governance System was able to bring all parties to the table and peacefully resolve differences, yielding a new water-sharing agreement.

As we find ourselves in 2050, the population in the community has stabilized at around 30,000. The town's economic base has diversified beyond solar farms into energy services and consulting, reducing reliance on tourism. Increased standards of living, education, and employment opportunities have eased ethnic tensions. Health outcomes have generally improved (lower malnutrition, lower infant mortality, reduced chronic diseases, etc.). Yet at the same time certain health issues have been aggravated, especially those related to heat, air quality, and psychological disorders. Increasing wealth has also raised obesity and cancer rates. Increasing life expectancies have generated pressure on working families to support their elderly relatives.

It is a world of great opportunity and yet great challenges. Hotter, drier conditions mean more frequent drought, wildfires, and vulnerability to extreme precipitation events (flash flooding and erosion). Water conservation has improved significantly over the past two decades, but it is unclear if the improved efficiency will be enough to meet demand in the coming decade; indeed, groundwater levels are at an all-time low, strained by demands from industry and domestic consumption. These environmental challenges are high on the priority list. While the world is more equal, it is not completely equal, and crime and social inequality remain pressing concerns. Climate migration is on the rise, bringing new generations of foreigners into the community and creating complex governance challenges.

Group 2: "Billionaires in the Boiling Broth"
Uncertainty: high economic growth / low equality

Mexican Terrorist Group Seizes Uranium-Rich Pueblo Site on Former New Mexican Hillside
Espanola, Mexico, September 9, 2051

Armed members of a northern Mexico militia group hold ancient pueblo buildings this morning after a midnight raid. The group claims control of the surrounding hillsides, which were found earlier this year to contain one of the world's largest uranium reserves. Leaders of native groups which have long called the land home appealed this morning to US government officials for support, citing an 1847 treaty recognizing traditional land rights and bi-national cooperation.

In the latest in a surprising turn of events that has brought the once near ghost town of Espanola to the international stage in recent months, the Mexican terrorists seized key strategic points on the former New Mexican hillsides late last night, issuing press releases via twitter this morning claiming absolute rights to subsurface uranium resources. This latest development disrupts high profile negotiations on the part of native land owners who, having remained on their land for generations as it slowly dried throughout the early 2000's, leading ultimately to the loss of viable groundwater, and the abandonment of the nearby Anglo-Mexican town of Espanola. The impoverished native group thus stands to gain immense wealth from the sale of the Uranium rich lands in a bidding war between a private nuclear development consortium and representatives of the Lithium-rich Bolivian state.

Readers will likely need reminding of the complex history of the area, which is now embroiled in a web of global energy and security politics.
As part of what was once southern New Mexico, these native lands, together with the town of Espanola were ceded to the Republic of Mexico in 2030, having become all but uninhabited through the loss of ground water resources to nearby mining operations and climate change induced drying. When the US settled with the increasingly unstable Mexican government by giving lands in exchange for repatriation of Mexican immigrants to what was then the American Southwest, the town became part of the Republic of Mexico. Little did either side then know of the immense wealth just below the surface of the Pueblo site.

Uranium was discovered here earlier this year as part of world-wide exploration undertaken by Yer Yeranium, a Chinese-led consortium in tight competition for market share of world-wide energy generation against Bolivian Batteries, that country's nationalized producer of lithium batteries, which has largely driven the recent drop in renewable energy prices. Because of their innovative battery design, Bolivian's batteries solved previous major impediments to scaling up of renewable energies. The subsequently

revived "green" economy has led to massive investments of all kinds, especially in remaining water-rich areas of the globe. Indeed, native leaders had previously hinted at their own plans to develop areas of the water-rich Pacific Northwest with a portion of their earnings from the sale of rights to the Uranium deposits on their lands. Observers at the Institute for American Progress cite the widespread political instability and heightened economic inequalities as causes of similar terrorist uprisings in several failing states. In recent white papers the group warned of future threats from nuclear-enabled rebel groups.

Group 3: "Middle Ages" (or Middle Aged with teenagers)
Uncertainty: low economic growth / low equality

2020: Conditions have not improved since 2011. The continual shut down of coal mines in the region due to global warming mitigation policies has increased unemployment and poverty. There is a general migration of youth to the local urban centers, and as such the population is aging. Agriculture is moving towards large corporate-owned farms that are growing corn and castor for biofuels, and as a result food prices are increasing. The tourism industry is still going strong, and foreign investors from develop a gated resort and condominiums. Still, the construction is drawing workers from the urban centers as well as from the town, so the jobs are not enough to reduce unemployment and poverty rates. Although there is a concern that the resort will increase stress on the water system, those concerns are overshadowed by expected income from the project.
2030:

2030: By 2030, climate change has led to more heat **waves, which** are continuing to tax the limited agricultural sector and are taking a toll on the aging population. The past two years have been especially warm and dry, and rolling blackouts occasionally occur due to high demand for air condition by the condos and resort. Quality of health care at the two hospitals is lagging that of neighboring communities due to lack of funding. It is clear that revenue from the resort / condominium is not staying in the community. Furthermore, property taxes are low for the resort / condominium, so there is little re-investment in local infrastructure. Water stress continues, and border tensions are increasing as a result.

2040: Canada has emerged as a new world power due to oil sands, increased agriculture, the opening of the Northwest Passage, and plentiful fresh water resources. Unfortunately, investors have decided to focus their efforts on the blossoming Canadian economy, and have pulled out of the resort / condominium complex. Funding for police and security is being diverted towards the urban centers, and less attention is being paid to border security. As a result, there is an increase in border tension. Crime and gang violence among different ethnic groups is escalating. The aging population is now taxing the very limited resources of the one remaining hospital after hurricane Jenn wipes out the other. The head of the Red Cross came to visit, but the visit was cut short due to violence and looting in the aftermath of the hurricane.

2050: Heat waves are now common, and the health system is unable to cope with the increased demand. Migration out of the community has led to blight and continued gang violence. Solar technology has improved considerably, and investors are looking into converting the nearby agricultural fields into solar farms. Skilled labor for those farms does not exist in the town, so development will rely on workers from other places. Although there is a concern that the solar farm will increase demands on the town's limited infrastructure, those concerns are overshadowed by expected income from the project.

Group 4: "Star Trek"
Uncertainty: low economic growth / high equality

Dateline: City of Enterprise, 9 September 2051

Next week our fair city of Enterprise will celebrate its 170th Anniversary, an anniversary that might never have come had it not been for the foresight of a few and the courage of an entire town. As we near this occasion, it is worth reflecting on the road that brought us to where we are today and use that to envision an equally successful future.

In mid 2011 we were a community in decline. Unemployment was at almost 9% and one fifth of the population was in poverty. Crime was triple the national average and our birth rate was negative. Alcohol was the drug of choice and death on the highway took many of our sons and daughters. Still, our forebears did not see a need to change until the cataclysmic fires of that record dry summer. The wildfires that had been raging found their way to and beyond our city limits and, in a single night, destroyed Shanty town, killing dozens. The over-burdened infrastructure failed, rendering fire and energy services response in adequate. It was in the wake of this tragedy that Enterprise found her soul.

After we buried our dead and mourned the lost, it was time to examine who we were and where we would go. The community council met and began developing a scenario that envisioned a world that reflected the low economic growth, but also the need for greater equity for all our citizens. They also recognized that our neighbors must be part of the solution and that sacrifice would be necessary from everyone. By communicating the concepts from their scenario planning, the council gained consensus throughout the community to raise the revenue necessary to create opportunity for all. And so they started.

The need for low-income housing generated by the fire had to be met first. Using federal and state provided funds, the city commissioned construction using local materials and labor. The design incorporated low energy and water intensity, which inspired architecture in the rest of the community as well as revisions to the town building code. This resulted in modest growth in these industries and a boon for the jobless. The next decision was to improve the infrastructure. Creating a low vehicle density zone in town with a New York style toll helped to reduce congestion and provide funding for part of the improvement. This investment resulted in expanded access to and use of our local

hospitals. This increase spawned additional job creation for adjunct industries to include, medical tourism, more schools, recycling and energy generated from waste. This insight in energy helped create the waste to energy plant, taking in waste from our neighbors and relieving some tension there. The extra income allows the hospitals to sponsor a free clinic, raising the health care accessibility throughout the community.

Over the course of the next two decades these efforts resulted in a reduction the joblessness rate to 3%. With improved education, birth rates stabilized and more young people remained in Enterprise due increase opportunities. Today, some forty years after that tragic night, although our economic growth is as slow as it is in the rest of the nation, our stable but low population growth provides for an equitable and happy town.

Next week as we all gather in Hemp Park for the celebration, we should bear in mind, that those who cast a vision of the future in their scenario development. They envisioned a high equity, sustainable community not dependent on runaway growth in which all member live in a happy, harmoniously civil society.

Final Woven Narrative (compiled with pieces from all four scenarios)

Armed members of a northern Mexico militia group seized ancient pueblo buildings this morning after a midnight raid. The group claims control of the surrounding hillsides, which were found earlier this year to contain one of the world's largest uranium reserves. Leaders of native groups, who have long called the land home, appealed this morning to U.S. government officials for support (citing an 1847 treaty recognizing traditional land rights and bi-national cooperation). The discovery of uranium has brought our town to the international stage in recent months, and the Mexican terrorists have now exploited our media spotlight. After seizing key strategic points on the hillsides late last night, they issued press releases via twitter this morning claiming absolute rights to subsurface uranium resources.

We are in Gallup, New Mexico in the year 2050. Despite moderate conservation measures, increasing population has depleted our groundwater supply by half. Over the past 50 years, the average temperature has increased 2°C in winter and 2.5°C in summer. We've seen a 20% reduction in the snow pack that feeds the major rivers that are used for irrigating crops, and a 10% decrease in winter precipitation that is paramount for recharging soil moisture in springtime. On average, daytime high temperatures exceed 45°C (113°F) for 40 days each summer.

The wildfires that had been raging found their way to and beyond our city limits and, in a single night back in 2011, destroyed Gallup, killing dozens. Our over-burdened infrastructure failed, rendering fire and energy services inadequate. After the fire, the need for low-income housing generated by the fire had to be met first. Using federal and state provided funds, the city commissioned construction using local materials and labor. The design incorporated low-energy and water intensity, which inspired architecture in the

rest of the community as well as revisions to the town building code. These efficiencies have helped Gallup meet its energy needs in an era of expensive power.

Heat waves are now common, and the health system is unable to cope with the increased demand. Migration out of the community by the wealthier residents has led to crime and continued gang violence. At the same time, certain health issues have been aggravated; especially those related to heat, air quality, and more recently, psychological disorders.

The continual shut down of coal mines in the region due to global warming mitigation policies has increased unemployment and poverty, however, our solar and nuclear power generation has improved considerably, and investors had been looking into converting the nearby agricultural fields into solar farms until the recent uranium discovery. Many of our power plant workers have been brought in from outside areas, thus keeping unemployment relatively high for Gallup locals, but now these workers are being involuntarily enlisted in securing the community's uranium resources.

Back in the late 2020's, tensions with Mexico over transboundary water usage nearly led to an outbreak of military conflict. However, in parallel, shared prosperity in the region had encouraged the rise of a shared governance structures. The "Regional Governance System" was able to bring all parties to the table and peacefully resolve differences, yielding a new water-sharing agreement. This agreement is now jeopardized by the uranium standoff and may on the table as a bargaining chip with Mexico or the terrorists.

Initial Fact Pattern for 2011

2011 WUN Scenario Retreat
Fact Pattern for Scenario Exercise
(Written by: Jeni Barcelos, David Battisti, & Jen Marlow)

The year is 2011. Our community of 20,000 people is situated in a subtropical arid climate. Winters are warm and dry, receiving about three inches of rain. Summers are hot, with daytime temperatures frequently exceeding 40°C (104°F) and nighttime temperatures above 27°C (80.6°F). Precipitation is unusual in the summer, except for rare occurrences of large amounts of moisture coming from the tropics, which can cause heavy downpours and occasional flooding. It is too dry and hot for any surface water supply of consequence, as water from the region's major rivers is diverted to the three largest urban centers, as well as to local agriculture. As a result, the major water source for the local population and industry is groundwater, which was deposited 20,000 years ago.

Despite years of drought, agricultural production has increased just a short distance across the border in ways that are counter to international water treaty provisions. Nearby indigenous communities grow maize and graze livestock but endless hot days and drought-conditions have decreased production.

Our community was officially founded in 1881 as a railroad hub between two of the region's most populous urban centers. Europeans, Asians, and Central Americans came to build the railroad, and many stayed in the region to mine coal. However, a more recent lack of economic development, in addition to many mine closures within the last century, has resulted in a large segment (more than 20%) of the population living in poverty, some residing in notorious slums. Our current unemployment rate is 8.7% (tourism has grown as a major employer of our citizens), and our crime rates are about three times the national average. The number of births in the community exceeds the national average, however, population is declining. Border tensions are high.

Also known for our ethnic diversity, one-third of our population has indigenous roots (from at least three different tribes) and many more are descendants of those original railroad workers. Because of this, we are a community of many religious faiths (more than ten), and a large percentage of us speak a second language in the home. The community voted down a political candidate running on an anti-immigration platform, and has a record for voting for the liberal party despite more conservative-leaning neighboring jurisdictions.

We have two hospitals, which is good because we are known as the "drunk driving capital" of our country. However, many of our community members are lacking health insurance (we placed fifth in the country for "largest number of people without health insurance coverage"). We also have a significant air pollution problem from unusually high particulate matter due to wildfires (which account for over 70% of emergency calls) and coal-burning power plants.