Alternative Responses to Climate Change in the Adirondack Region

Workshop Two
Chestertown Town Hall
June 15 & 16, 2015

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About this Document

This is the complete documentation of the scenario development workshop held at the Chestertown Town Hall with 29 participants. It contains the various presentations and discussions that occurred. Corrections or additions can be sent to Jim Herman (jim12942@gmail.com).

We wish to thank Fred Monroe and the Town of Chester for providing the space for our workshop.

This workshop is the second in a series of two-day workshops that are exploring how the region responds to the threat of disruptive climate change. This series is a deeper exploration of issues that arose in the ADK Futures scenario development project. You can follow our progress by checking into the project website: www. ADKfutures.org.

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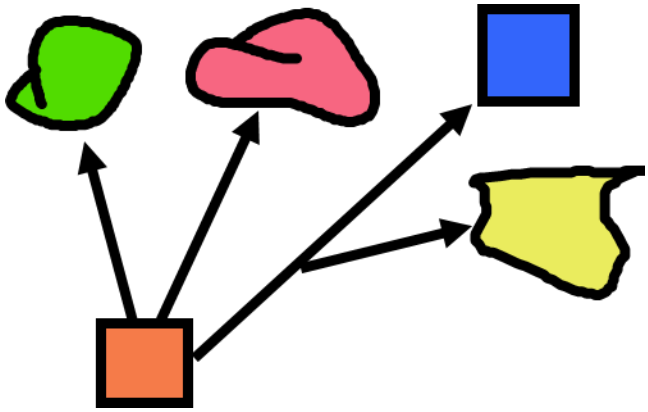
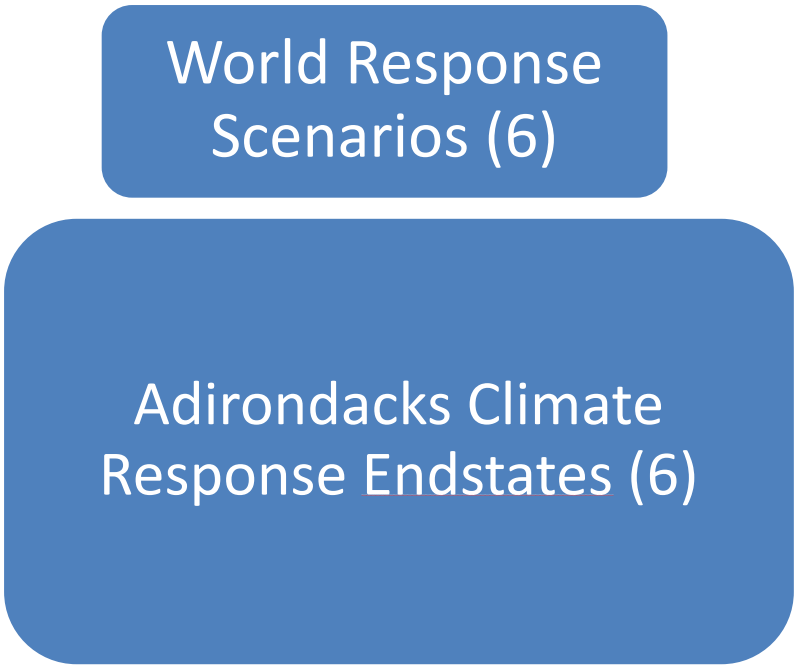
The Process and Content

This scenario development process is based on the following principles:

- **The highly prepared meeting**. We interviewed all participants ahead of time in order to understand the issues facing the region with regard to climate change and to solicit ideas about important actions, investments, changes in law and regulation, etc. that would be necessary for "good futures" to transpire. In this way, the participants were presented with a lot of ideas to work with and spent relatively little time getting started. All participants received the six endstates one-week prior to the workshop and were asked to read them carefully and complete an exercise in which they rank ordered them from most to least desirable and most to least attainable.
- **Two-part definition of scenario**. In this approach a scenario is divided into the **endstate** or outcome statement at the planning horizon (in this case 2040) and a series of **events** that must occur or must not occur that lead us from the present to that outcome. For this project, we wrote 6 endstates and 107 events based on the interviews and other research. The endstates describe an Adirondack Region Response to Climate Change by 2040. The events each describe a single action or condition at some point in time between now and 2040. Their timeframe is described as 2, 5, 10, 15 or 20 years from now.
- **Multiple, diverse but not necessarily divergent scenarios**. The scenarios are not all about the same issues and they are not all mutually exclusive. By dividing up the issues into different scenarios, each team is not working on the same thing and more work gets done. Overall, the scenarios do frame important choices that we face here in the region.



Each Scenario is a Vector from Today to the Future



- **Context Scenarios.** Because our ADK response must be effective in a global context, we wrote six alternative scenarios for the world's response to disruptive climate change over the next 25 years. For example, in one scenario, global treaties and carbon taxes are in place. In others, they are not.

The workshop is divided into these major task blocks:

- **Current Expectations, Context Scenarios.** We asked participants to probability rank (most likely to least likely) the world response scenarios that provide the context for the region's efforts.
- **Current Expectations, Events.** Participants sit down in five teams, read through the 107 events one by one and vote on each one's likelihood. Each person votes their personal opinion but because they are in a team they can see where their expectations align with their colleagues or not.
- **Analyze Endstate**. Each team has been assigned one of the endstates. They are asked to defend it as a lawyer would defend a client, in role play style, even if they have objections to it. (The sixth endstate F: Reaching a Regional Tipping Point is a very negative scenario and the analysis was done by the facilitators). They must decide on the way they wish to interpret and defend it and answer these questions about it:
    - What are the 5 – 7 main features of your endstate?
    - What are the main driving forces of this response?
    - Who are the players that make this endstate happen? (e.g., business, NGOs, different parts of government, etc.)
    - What are the biggest obstacles to overcome?
    - Come up with a tag line and/or icon for your endstate

- **Wind Tunnel Exercise.** Use the context scenarios to see how your endstate might be affected by different external situations.
    - How well does your endstate work in each of the Global Response scenarios (G1-G6)? For example, if the response is not led by international agreements, does your scenario do poorly, or do just fine? On a scale of very well (++) to well (+) to neutral (0) to poorly (-) to very poorly (--).
- **Select Events**. Each team then went through the events again and selected those that helped the development of their endstate or hurt its development. They also wrote additional events needed for their endstate to come about, and changed the pre-written events' dates or details. They then clustered the events into major themes that related to their analysis of the endstate and pared them down to around 50. It was a lot of work to make sense of all the event selections and figure out which ones were really most relevant to the team's particular endstate. Often they laid out the cards on the floor.
- **Team Presentations**. On the morning of the second day each team presented its endstate analysis and their narrative of events that got us there. Next, they responded to questions from the rest of the participants. Then each team member was given the opportunity to briefly describe their personal opinion of the endstate. After all the presentations were given, the participants ranked the endstates in terms of Desirability and Attainability.
- **Data Feedback**. The results of the two ranking exercises (pre-workshop and after the presentations) were presented and compared. We also presented all the fitness ratings against the world scenarios. The ways in which the events selected by each team intersected was also examined.

Composite Scenario Development. Participants were then assigned to new teams, asked to consider all the endstates and their event paths and draw a synthesis or composite diagram that better expresses how we should think about an Adirondack region response to climate change. Teams then briefly explained their synthesis. The meeting ended with a plenary discussion.

The Participants

The 29 participants were a diverse group that represented a broad cross section of organizations and roles across the Park as well as State Government and the private sector. Particularly gratifying was the participation by college students and other millennials. Here they are in alphabetical order by organization. We wish to thank them for making the effort to participate.

Workshop Group Photo

Name	Affiliation
Lisa Adamson	Lake George, Glens Falls
Stephen Danna	Climate Reality Project, Queensbury
Naj Wikoff	Keene Valley
John Collins	Blue Mountain Lake
Bob Hest	R.G. Hest & Associates
Sherm Craig	APA Commissioner, Wanakena
Annette Craig	Community Activist, Wanakena
Carla Smith	Student, UVM
Monique Weston	Concerned Citizen, Keene
Aaron Woolf	Documentary Film Maker, E-Town
Patrick Nelson	Entrepreneur, Stillwater
Margaret Irwin	River Street Planning, Troy
Bill Brown	Environmental Scientist, Potsdam
John Sheehan	Adirondack Council
Colin Beier	SUNY ESF Newcomb
Ray Curran	Environmental Scientist, Wilmington
Jennifer Bine	Adirondack Museum
Stephen Dehond	NC 350.org, Saranac Lake
Hallie Bond	Union College
Ariel Lynch	APA, Saranac Lake
Gina Fiorile	The Wild Center

Bob Stegemann	DEC, Ray Brook
Neil Woodworth	Adirondack Mountain Club
Rob Snyder	Anthros Consulting, Boston
Ethan Pierce	DEC, Ray Brook
Ezra Schwartzberg	Environmental Research, Lake Placid
Larry Master	Intervale Lowland, Lake Placid
Andrea Mitchell	Concerned Citizen, Lake George
Michelle Howland	SUNY Plattsburgh Queensbury

The Facilitators

This project is a *pro bono* effort by Dave Mason, Jim Herman and Kathy Hornbach of Anthros Consulting, Inc. This workshop was facilitated by Jim and Dave. Dave, Jim and Kathy ran a boutique strategic planning consulting firm through the 1990's. Their clients were large, global organizations as well as some government agencies. This scenario development methodology was the core of their practice. Jim and Dave sold the business in late 1999 and after a few years retired and moved to their vacation home in Keene, NY. They have contributed to a number of non-profit and public improvement projects in their town, most notably the Town-Wide Broadband Project. With Kathy, they were the leaders of the ADK Futures project. With others they are now launching Anthros Consulting to use this methodology to help organizations confront the threats and find the opportunities to prevent disruptive global environmental change.

Executive Summary

This workshop was the second a series that will use scenarios to collaboratively explore feasible responses to climate change, consider where the emphasis of resources and attention should be directed over time, and propose key actions to achieve desired outcomes. This workshop looked at a wide range of possible responses by the Adirondack region[1].

In this workshop we focused on six different possible outcomes (endstates) for the region by the year 2040[2] in terms of its response to the threat of disruptive climate change. To provide context to the debate, we provided six scenarios for the broad world responses to climate change.

Somewhat surprisingly, this group had a certain level of optimism about the future. In the voting on current expectations about future events, there was a large consensus on many key events, especially those related to adoption of clean energy technologies. We are already doing a lot in the region and there is good reason to believe we can do more. Some sectors like agriculture should actually improve in the future. There was also some hope that general public support for action would grow over the next decade and that schools and churches would play a leading role in this.

This group's expectations concerning world responses showed the usual pessimism about top-down national government and international agreement efforts. There was hope, however, that bottom up efforts at the regional, city and small country level were showing progress and helping to bring the cost of new technologies down. Meanwhile, the group saw that the private sector was beginning to awaken to the need to act and the possibility of new business opportunities in the conversion to clean energy and the adaptation to changing climate. In discussion, we noted that climate change has been such a politically fraught topic that many people have just decided to do climate smart things but not say it is because of climate change. Oblique approaches that get necessary changes to happen but under other banners than climate change was seen as a common response. As the political winds shift and it is safer to be openly planning for climate change, we may find that a lot has actually been accomplished.

This group worked creatively with the six regional response scenarios:

A: Minimize Our Carbon Footprint
B: Community Resilience
C: Hyper-Green Human Refuge
D: Rise Up and Demand Change
E: Pragmatic and Measured
F: Regional Tipping Point

Based on the analysis, presentation and debate of each scenario by one of the teams, and the creation of composite scenarios by new teams at the end of the workshop, we summarize the group's

[1] Adirondack region is defined as all towns with at least some land within the Blue Line as well as major surrounding communities of the Park such as Plattsburgh, Watertown, etc.
[2] A 25 year horizon was taken because of our focus on how the human race responds to a threat that may not transpire until far in the future. Our assumption is that the next 25 years are crucial in avoiding the most catastrophic outcomes late in the century.

conclusions for each of these scenarios. The composite scenario analysis provided many ways of looking at how these individual scenarios might unfold over the next 25 years. This analysis can be found in the endstate synthesis section of the report.

This group was more positive about achieving the low carbon rural lifestyle envisioned in the A scenario than the previous workshop group. We have a good plan for moving to more clean energy for electric power generation. We can embrace a clean energy future as an economic opportunity. This has been a major theme of our region's strategy for the North Country Regional Economic Development Council (NCREDC). So we are starting at a pretty good place. There are a lot of clean energy projects underway in the region. Notably Chestertown, where the workshop was held, is leading the region in municipal solar PV. ANCA is spearheading "solarize", a regional effort to ramp up solar PV installations.

The B scenario, about community resilience, was seen as critical for us to move toward, as the group felt that the world response to climate change would not be fast enough to forestall serious climate impacts in the future. We need to be proactive in this and get funding for reinforcing infrastructure of all types before downstate efforts dominate funding needs.

The C scenario's possibly better future for the region under a warming climate was seen as a limited offer that requires we do the B scenario first. If this develops, it will be later. There was a concern that C would be a transient condition, not stable or permanent characteristic.

The D scenario about engaging the public in multiple ways to rally for action was new for this workshop and the team developed it well. In their view, we needed more highly visible and damaging weather events like a big fire or huge flood to really capture the average citizen's attention. The group saw that there were many ways to rally public opinion, especially through the schools and churches.

The E scenario argued for a pragmatic and measured approach. This team's development of the scenario made it fairly similar to the B scenario but obviously less proactive and with lower investment up front.

The threat of the F failure scenario was always present to spur us forward toward action on mitigation and resilience while getting more people engaged in these critical issues.

There was strong convergence on a short list of actions to take. Doing a lot more on energy efficiency and clean energy was something all teams endorsed. For solar, there was strong support for setting up shared solar arrays. For this to become widespread we need the legislature to pass the Community-Based Virtual Net Metering bill pending in the legislature.

- 29 **Wave of Energy Efficiency Projects by Region's Municipalities**
- 45 **Local Solar Arrays Proliferate – Public, Private, Education**

Agriculture was seen as a sector that could benefit from the coming changes if we plan well and use advanced techniques with help from places like Cornell Extension.

- 24 **Cornell Extension Promotes Adk Agricultural Climate Change Adaptation/Mitigation**

The need to rally public support was a common theme. This will be done through education in the schools and for the general public as well through churches. Use of citizen science programs to engage young people especially in monitoring the impacts of climate change was seen as a good strategy.

- 73 **Wild Center Receives Major Grant to Develop HS Curriculum on Climate Change**
- 75 **50% of Adk Schools, Camps and Clubs Have 'Climate Watch' Data Gathering Programs**
- 80 **Many ADK Churches Rally for Climate Change Action**

There was much to be done at the town and county level to increase community resilience and prepare for more severe weather.

- 60 **Regional Severe Emergency Response Plan in Place**
- 88 **Town Board Training Now Includes Climate and Resilience as Major Topics**
- 86 **Adirondack Towns Win Big Climate Change Grants**
- 56 **Majority of Adirondack Region Towns Sign on to Climate Smart Program**
- 89 **Many Towns Successfully Complete Map Amendments for CC Adaptations**

There was also much for New York State to do to follow through on the good programs it has already put in place.

- 97 **NYS Lowers Grant Thresholds from $1M to $10,000**
- 100 **Community Risk and Resiliency Act Drives Climate Change into all State Planning**
- 101 **Amendment Allows Climate Smart Road and Utility Modernization Projects**
- 103 **DEC and DOS Fund Resiliency Planning Efforts State-Wide**

As we finished the workshop there was a lot of agreement about the way forward and many of the key steps to take. Many people said that they left this workshop at least a little more optimistic about the future of the region and our ability to address these serious issues.

May people felt that the workshop helped them to see that we can take pride in what we have accomplished so far and find energy to keep moving ahead. This can be like the threat of invasive species, something that the region has rallied together to fight. Quick education of government agencies, elected leaders and collaboration across organizations was key to our effective response to invasives. Similar steps are needed in our response to climate change. The Common Ground Alliance Forum is a key venue to build momentum and support. Let's use this year's session on climate change to maximum advantage. Let's create a clear and compelling vision of how we respond to climate change and build support at all levels for implementation.

We should be reaching out to the region's schools to get this message to students and faculty alike. Wherever we can, we should engage young people in the effort. Get a small group together that can spread the word and speak at important forums. Get in front of the Inter-County Legislative Committee of the Adirondacks, the Local Government Review Board, the Association of Adirondack Towns and Villages, the three Regional Economic Development Councils that cover the region, and the APA

Commissioners. Get exposure in the media like the New York Times. Spread the word that there is a vision and movement here in the Adirondacks. We can be an example to other regions.

At the end, there were some voices of pessimism, people who have been working on these issues for a long time. But there was also optimism from younger voices who see this as a challenge and a series of problems to solve. There was a sense that although government isn't yet leading on these issues, there is a lot of activity at different levels and in the private sector. There are many paths to progress and we can be part of many of them.

The Global Context Scenarios

Although this workshop focused on the responses of this particular region, it was important to have the discussion set in the context of different ways the human race's responses might play out over the next 25 years. Therefore, based on our research and what people said in the interviews, we developed six scenarios about the world's response to climate change over the next 25 years.

Participants were sent the world response scenarios (designated G1, G2, G3, G4, G5 and G6) in the pre-read package for the workshop and they were presented by the facilitators at the workshop and discussed by participants. Then, as an initial exercise, we asked the participants to rank order the world response scenarios from highest to lowest probability of happening in the next 25 years. They did this individually.

World Response Scenarios 2015 to 2040

These are six alternative visions of how the overall world response to climate change plays out over the next 25 years. In our minds, it is crucial that some significant response is mounted by the end of this period.

G1: Governments Get in Gear

By 2020 almost all leaders of the major emitting nations took the threat of severe climate change seriously and embraced the need to cap emissions as quickly as possible. They finally initiated serious action to pare emissions by 80% of 2005 levels by 2040. The deniers and advocates of dirty energy were increasingly demonized. In most of the world there was no ideological battle. The science is clear and you would be a fool to ignore it. The US and China led and much of the rest of the world quickly followed.

In the US, conservatives come to see that not stopping global warming would be a tremendous gift to Russia while seriously damaging the US and its allies. Developed nations fear the disruption of the geopolitical order that climate change portends. Already, climate-driven migrations are an increasingly serious concern. Since conversion of the world's energy infrastructure will take decades, priority is put on steps that make the biggest difference soonest: ending coal use, stopping all methane leaks, drastically lowering black soot levels and halting deforestation.

The key step is forcing those who emit GHGs to pay in proportion to the amount released. Most of the major emitting nations agree to a set of tariffs that penalize countries that don't put a price on GHG pollution, instituting a "climate club". This effectively stops freeloaders and makes clean energy the lower cost option. The revenue from emission charges is used to fund energy and transportation innovations as well as recompense those most hurt by the changes. With assistance from the leaders, developing nations leapfrog into clean energy infrastructure the same way they leapfrogged into mobile communications networks.

G2: Bottom Up Progress

Although lots of national commitments are made, they were rarely met, and often rescinded by succeeding administrations in the US and elsewhere. The Paris accords are rarely followed and the IPCC process has become largely irrelevant. Instead, a diverse set of local and regional incentives, regulations and taxes sprout up throughout the world in line with local support, and evolve with experience. The impacts and implications of climate change are felt differently in each locale, leading to different priorities and motivations. Almost all adaptation is local or regional. Rebuilding more resilient infrastructure after storms is just common sense. Big coastal cities are major laboratories of change and innovation.

After some regions demonstrate that you can make major changes in energy infrastructure, and save money in the process, it is easier for others to get on board. In reality, for a long time climate change work was actually being done, but largely under the radar. When opinion rallies sufficiently to make it OK to come out in the open, we find that a lot of progress has already been made and planning for a changing climate and clean energy is integrated into most processes of government and the private sector. The early adopters of clean energy ramp up volume and foster steady innovations that make it cost effective for the majority to adopt later on. Progress isn't universal, but it is accelerating and the necessary pieces to a full solution are in place and understood by 2040. Pressure on world leaders to implement consistent and comprehensive policies is finally compelling. Many fear we have let things go too far, but we have finally turned the corner.

G3: Private Sector Leads

Early on, it was the transnational corporations that took the risks of unfettered GHG emissions most seriously. The implications of the science were clear and they started factoring expected changes into their strategic plans. Once they realized the climate problem wasn't going away, businesses worked to get out front and exploit the enormous opportunities presented by the extraordinary changes needed in energy production, agriculture, and infrastructure, etc., not to mention all the work needed to clean up after the seemingly endless storms, floods, fires, etc. Water is a huge investment area with desalination being used more widely and efforts to reduce water needs of agriculture in full gear.

Having learned from other disruptive changes like the Internet, they ignore this at the peril of their business going away or competitors taking the lion's share of the profits. There will be some winners and a lot of losers because of climate change. Business strategy and planning are increasingly about getting on the winning side of this. In sector after sector (insurance, large scale project engineering, agriculture, and defense) climate risks and opportunities are put front and center. Momentum builds as the potential for new jobs and cheaper, better technologies are increasingly evident. Who could be against lowering their energy costs and curbing air pollution along the way? The auto industry embraced the challenge of step-function increases in fuel efficiency, surpassing the 56mpg CAFE standards of 2025. The airline industry also responded with fuel efficiency improvements and emissions reductions in response to targets set internationally. The corporate world strategizes to save the planet and make a fortune too.

NGOs offer prizes for innovative solutions (e.g., in transportation and fresh water production) as had been done with fighting malaria and jump starting private space travel. Zero emissions is as much of a business mantra as zero defects. Global capital markets coupled with state-of-the-art marketing programs enable the rollout of clean energy at scale. Even the fossil fuel companies eventually see the writing on the wall and diversify into clean energy and new markets for water exploration. Oil doesn't go away, but it is burned with emissions controls in most situations. Large numbers of companies and organizations use the strength, depth, and power of the marketplace to solve problems at scale. Leading organizations adopt internal carbon pricing to put them a step ahead of competitors. Facing a patchwork of local mechanisms for carbon pricing, global business leaders demand a consistent systems that removes the uncertainty in the payback on clean energy and efficiency investments.

G4: Taking It to the Streets

Throughout 2020's policy makers in the US remained oblivious and seemingly in thrall to the fossil fuel companies and radio talk shows, but the younger generation saw itself facing increasing climate deterioration. Young people globally were seeing though the hypocrisy, greed and token gestures. Even by 2030 no major fossil subsidy has yet been cut. Oil and gas exploration was still moving at full speed while clean energy subsidies were reduced. Peaceful marches by 350.org and the like had not moved the needle. Disinformation and fear mongering still prevented most legislatures from enacting major changes in energy policy.

Just like the anti-war movement in the late 60s and the nuclear freeze movement of the '80s, colleges and universities around the world become centers of student and teacher radicalization. Students rise up in large numbers - there are angry marches, sit-ins, and violence as well as sophisticated cyberhacking. "Take Back Our Planet" is the common cry. Around the world university classes are suspended as professors join in demanding meaningful climate action. Cyber-sleuthing on perceived villains, like oil companies and their back pocket politicians, reveal the depth of their cynical manipulations and callous disregard for the future of the planet. Students succeed in radicalizing their parents and older siblings. Increasingly, the middle class, stung by extreme weather, gets fed up as well and join the youngsters in their protests. Aging hippies from the 60s reawaken their activism and teach their tricks to the next generation. A new climate flag becomes popular, like the peace sign of the 60s.

The divest fossil fuel stocks movement goes global and is increasingly used as a way to shame companies and institutions that are not lining up with the movement. Eventually, the protests become strong enough to displace entrenched interests. Bill McKibben finally is seen smiling every once in a while as legislatures around the world are now much more committed to serious climate action.

G5: The Oblique Path to Progress

Humans and governments are not wired to deal with long-term, abstract problems like climate change. By 2020 climate change fatigue had set in in the environmental community with some backlash against it sucking up all the oxygen in any environmental discussion. Instead the problem is recast as solving

other more immediate and tangible problems like deadly air quality in India and China, or protecting tropical forest ecosystems.

Even in 2040, climate change is not seen as either the number one social or environmental problem, but it is a mainstream factor in almost all planning and policy. There are no longer any climate change task forces or special climate offices. Investing to reduce poverty, improve education and healthcare, and raise standards of living in the developing world gives them the ability to adopt clean energy infrastructure and build new resilient public works, while causing birth rates to drop fast. Many emerging countries are able to leapfrog in technology and practices to the latest and cleanest.

Policy makers and environmental NGOs see habitat destruction and the global spread of invasive species as more damaging to the environment than climate change at this point. Water issues, floods and droughts, are the most compelling and the public is highly motivated to deal with them. Reductions in GHG emissions are a side-effect rather than the justification for most efforts. Converting to clean energy is seen as a cost saver, a public health improvement and a reduction in the adverse side-effects of fossil fuel extraction.

The focus is on "no regrets" investments in resilience that are cost effective now and make sense under a variety of possible future climate scenarios. Once the low hanging fruit is addressed, technology and science will have advanced sufficiently to make the next few steps clear. The really hard problems are put off rather than being put front and center in a way that sets up big battles between powerful competing interests. This is not the fastest route to mitigation, but it's the most realistic.

G6: Welcome to the Anthropocene

The global response never got in gear and even by 2040 it is completely insufficient. The developing world (especially India, Brazil, and Indonesia) makes little progress in reducing emissions, convinced they have no choice besides exploiting cheap fossil fuels to lift their people out of poverty. Entrenched interests effectively thwart high-level policy changes until devastating impacts are clearly unavoidable. It proves impossible to drastically cut emissions from fossil fuels given the complexity, vast scale and sunk costs of the existing energy system. Improvements are taking decades in most of the world even when the goal is clear and the incentives aligned, neither of which is usually the case. What becomes really detrimental to progress is the global glut of fossil fuels that keeps them really inexpensive for a long period of time.

By 2040, it is clear that global emissions will not be 80% lower than 2005 levels by 2050, not even close. Inertia will carry us well past 600ppm of CO^2. The bad effects of this are beginning to become obvious: extreme weather events, extended droughts, very large fires, new pandemics, etc. Many major cities have severe water outages. Growing numbers of climate refugees leave the coasts and the subtropics. Measurements show that several positive feedback loops are kicking in, such as the melting of the permafrost and the near complete elimination of arctic sea ice in summers.

Available resources focus on preparing for the worst and rebuilding after disasters rather than serious reductions in emissions. More and more pundits embrace the reality of the situation: no part of the earth is untouched and the classic conservation goal of preservation is simply no longer realistic.

Progress in biotech has produced effectively reengineered crops and herds for human consumption. Science will blunt the most serious impacts on humans of climate change. A number of nations are testing geoengineering technologies, which deliver a big relief from temperature rise for a relatively small investment. It's so cheap, it's hard to see that someone won't try it as conditions get really bad.

World Response Scenario Ranking

After discussion, the participants rank ordered these scenarios from highest to lowest probability of happening in the next 25 years. They did this individually. The result suggests that indirect, bottom up and private sector actions are the ones to dominate the next 25 years, not the possibility of a global protest movement or top-down government policy change. The low score for the G6 scenario of failure to address climate change is encouraging.

Rank	Scenario Title	Score
1	G5-Oblique Path	71
2	G2-Bottom Up	70
3	G3-Private Sector	67
4	G4-Take to the Streets	43
5	G6-Anthropocene	31
6	G1-Gov'ts Get in Gear	18

*The score is the normalized sum of the scenario's rankings. If everyone ranked a scenario most likely, it would get a score of 100. If everyone ranked another least likely, it would get a zero. There are no very high or very low scores in this ranking, indicating that there was a fair amount of conflicted voting.

Task 1: Current Expectations

The first major team task of the workshop asked the participants to go through the 112 events and vote on whether they thought each was:

- Highly likely to occur within the specified timeframe (greater than 75% chance in their personal opinion) or
- Highly unlikely to occur (less than 25% chance) or
- Uncertain.

At each team table the number of each was recorded and then we summed the votes across the entire room.

The purpose of the exercise was twofold. First, we wanted the participants to become familiar with the events so they could use them well in the afternoon exercise. Second, we wanted to see what their *current expectations* were concerning possible future events.

Highly Likely or Highly Unlikely Events

The full listing of current expectations voting is available as an appendix. Here we summarize 44 events for which there was significant agreement across the room. If the percentage of those who thought the event was highly likely (labeled HL%), minus the percentage that thought it was highly unlikely (labeled HU%), was greater than plus 60% or less than minus 60% (labeled Cert% in the table below), it made it onto this list. The column labeled UN% gives the percentage of those who voted that the event was uncertain. The voting results from 44 events meet this criterion. Two events that were deemed highly unlikely are in *italics*. The rest were highly likely. The two unlikely events had dates that were too soon. If they had been further out they would not have been highly unlikely.

HU%	UN%	HL%	Cert%	Card#	Yr	Title
89	7	4	-85	2	5	*Most ADK Property Managers have a Climate Change Response Plan*
11	18	71	60	9	5	Habitat Connectivity Projects Receive Priority Funding
	7	93	93	10	5	Citizen Scientists Perform Third Breeding Bird Atlas
4	21	75	71	12	5	A Review Paper in Science Indicates a Big Increase in Number of Ecosystems Experiencing Step Changes
		100	100	18	15	Ticks and Poison Ivy Now Common in the Adirondacks
7	11	82	75	20	10	Massive Expansion of Investment in the Water Sector
		100	100	22	20	Third Extraordinary Flood Event in 25 Years Hits Adirondack Region
7		93	86	23	4	US Food Prices Spike
11	14	75	64	24	5	Cornell Extension Service Promotes Adk Agricultural Climate Change Adaptation/Mitigation

4	18	79	75	27	15	ADK Region Farms Improve Soil Health for Climate Change and for Themselves
	4	96	96	29	2	Wave of Energy Efficiency Projects by Region's Municipalities
4	29	68	64	31	5	Housing Rehabilitation for Energy Efficiency Takes Off
	14	86	86	34	10	Easier to Change Fuels than to Get People to Change Habits
3	3	93	90	38	20	15% of Seasonal Homes Now Occupied Year-Round
3	24	72	69	39	2	Mineville Pumped Storage Project Gets Final Go Ahead
	21	79	79	41	5	Energy Financing and Improved Performance Boosts Renewable Power Adoption
7	14	79	72	42	5	Buyer Groups Lower Cost of Energy Conversion
		100	100	43	5	Microgrid for Potsdam Up and Running
3	10	86	83	44	5	Major Fight over Siting of Solar Array in Keene
7	10	83	76	45	8	Local Solar Arrays Proliferate - Public, Private, Education
3	17	79	76	46	10	New Grid Plans Emphasize Distributed Local Power Production, Electric Vehicles
14	11	75	61	51	10	Growing Interest in Hydrogen Vehicles in Some US Markets
		100	100	53	15	Average Electric Car Range Exceeds 250 Miles
7	17	76	69	55	20	Fed-Ex and UPS Delivery Trucks Converting to Hydrogen in Region
	14	86	86	57	4	AATV Convenes Extreme Weather Summit
3	28	69	66	58	4	Detailed Sub-Region-Specific Climate Models have Higher Accuracy
3		97	94	60	10	Regional Severe Emergency Response Plan in Place
	10	90	90	62	15	Ice Storm Adaptation Skyrockets in Importance
		100	100	67	5	Community Colleges Offer 'Low Carbon Footprint' Job Training
	34	66	66	68	7	Plattsburgh is a Clean Power Site, Attracts Certain Industries
14	10	76	62	71	15	Biomass Energy Is a Good Source of New Jobs in the Park
90	3	7	-83	72	2	*State Funds Support for Public School Sustainability & Emergency Sheltering*
7	10	83	76	73	4	Wild Center Receives Major Grant to Develop HS Curriculum on Climate Change
10	17	72	62	77	5	Regional Colleges & Universities Win Many Adk Climate Change Related Research Grants
17	3	79	62	80	5	Many ADK Churches Rally for Climate Change Action
10	17	72	62	82	10	CC Now Polls in Top 4 of Americans' Priorities
3	24	72	69	85	12	Climate Change Deniers Face Social Ostracism
7	10	83	76	88	5	Town Board Training Now Includes Climate and Resilience as Major Topics

	17	83	83	91	10	New, Highly Accurate, Flood Maps Drive New Insurance Rates
10	7	83	73	92	10	Most ADK Towns Have Single Stream Recycling
3	21	76	73	96	20	Entire Hamlet/Village Neighborhoods Decide Not to Rebuild after Disasters
	28	72	72	100	4	Community Risk and Resiliency Act Succeeds at Driving Climate Change into all State Planning
	24	76	76	101	10	Amendment Allows Climate Smart Road and Utility Modernization Projects
		100	100	103	8	DEC and DOS Fund Resiliency Planning Efforts State-Wide
3	21	76	73	105	15	NYS Hits Target of 50% Reduction in Emissions in Power Generation Emissions
	3	97	97	107	20	State Shifts Spending Focus to Adaptation

The facilitators clustered these 44 events and talked through the clusters and their implications.

Weather, Water, Models

- 100% of attendees thought 3 extraordinary floods in 25 years was highly likely. Ice storms would be a bigger problem.
- The climate models however are getting better at downscaling, producing sub-region climate outlooks that are generally accepted
- Investment in water related infrastructure of all sorts is growing fast

Flora and Fauna

- Ticks and Poison Ivy are more prevalent than ever (100% highly likely)
- Citizen Science, Produces the 3rd Breeding Bird Atlas
- Habitat Connectivity Projects get priority funding
- A paper in Science shows increasing number of ecosystems experiencing step changes

Food and Agriculture

- US Food Prices Spike
- ADK Farmers adopt soil carbon storage practices like no-till and bio char
- Most ADK towns have single stream recycling

Opinion

- ADK churches take influential roles in local climate change work
- Polls show climate change in top 4 of American's priorities
- Climate Deniers face social ostracism

Electric Power Generation

- Easier to Get People to Change Fuels than Habits

- Buyer Groups and Financing reduces cost of solar PV now appearing all over. Of course there are fights over citing and view sheds.
- Energy efficiency projects from town and country government take off
- Mineville pumped storage project get final permit,
- Potsdam microgrid up and running (100% highly likely)
- NYS meets its target of 50% reduction in power generation emissions by 2030

Clean Energy Jobs

- Community Colleges Offer 'low carbon footprint' job training (100% highly likely)
- Biomass is a good source of jobs
- Plattsburgh gets new industry seeking hydropower 'green' energy
- New grid plans emphasize distributed local power production and electric vehicles

Transportation

- Average electric car range exceed 250 miles (100% highly likely)
- Growing interest in hydrogen vehicles, especially large fleet truck operations

Housing

- 15% of seasonal homes now occupied, housing rehab for energy efficiency takes off

Education

- Wild Center works on high school curriculum
- Regional colleges, universities and research areas win many climate related research grants

Community Resilience

- DEC and DOS fund resilience planning efforts state-wide (100% highly likely)
- Town Board training now includes climate and resilience
- Community Risk and Resilience Act runs smoothly into all NYS funded projects
- Amendment allows climate smart road and utility projects
- New flood maps, costly insurance, entire neighborhoods decide not to rebuild
- AATV Convenes an Extreme Weather Summit. Regional severe emergency response plans put in place.

Conflicted Events

The most conflicted events are where most people have opinions and voted, but split nearly 50:50. There were 5 of these (one other was a poorly written event).

- The success or failure of the wood boiler swap program was split
- The notion of the industrial forest being largely for energy was split. The abandonment of ADK industrial forest was also split
- The event describing a study showing Park population moving from back country and small towns to the larger hamlets and villages was split

- Lastly, hiker boot washing stations common was a split event

What Future Do These Events Imply?

This is really a pretty optimistic and heartening set of expectations. There is and will continue to be a lot of activity on clean energy and energy efficiency improvements and this would be a source of new jobs. Lots of effort to become more resilient is expected. New transportation approaches (electric and hydrogen) would become widespread. Agriculture should see a boost and there may be more year-round residents. We will overcome the negative influence of deniers and get broad public support over time. But there will also be more floods and bad ice storms.

Current Events and Factoids

We also provided the participants a set of 25 events or facts that are currently true or have happened recently. Some are surprising. There were no exercises that used these but they were made available for participants to scan.

#	Title	Description and Source
1	**2.4°F Rise Inevitable**	The planet has warmed 1.4°F since pre-industrial times, with at least another 1.1°F in the pipeline, even if all greenhouse gas emissions stopped today. Source: IPCC's Climate Change 2013; With Speed and Violence: Why Scientists Fear Tipping Points in Climate Change, by Frank Pearce
2	**17% Chance of Passing a Big Tipping Point, Scientists Estimate**	43 top climate scientists were asked their opinion on the risk of reaching a tipping point leading to climate catastrophe. The consensus was that there was a 17% chance of this happening with a rise in temperature of 2-4 degrees C, increasing with higher temps. Source: Imprecise probability assessment of tipping points in the climate system. Elmar Kriegler, et al Published in: Proceedings of the National Academy of Sciences www.pnas.org/content/106/13/5041
3	**Ocean Acidity Up by 25%**	Ocean acidity has increased by 25% in recent times, and is expected to double by the end of the century. Organisms with argonite and calcium exo-skeletons are most at risk – Alaska king crabs, conchs, spiny lobsters, oysters, blue crabs, steamer crabs, scallops and coral reefs, for example. Source: Deep Future, Curt Stager
4	**Next Ice Age Has Been Prevented**	For hundreds of thousands of years, the earth has been cycling in and out of ice ages. We are currently well into one of the brief warm spells between long glaciations. Paleoclimatologists now believe that the man-made temperature increases have headed off the next ice age (which was, in any case, tens of thousands of years in the future). Source: Deep Future, by Curt Stager

5	**US Ratifies Minamata Convention to Limit Mercury Pollution**	The US has ratified a successful global treaty on mercury pollution, the 2013 Minamata Convention. It was adopted in 2013. There are 9 ratifications so far and 50 are needed for it to go into force. The global community can still come together on environmental issues. Source: www.mercuryconvention.org
6	**Oil Supply Up, Prices Down**	Nov 28, 2014 NY Times: "Domestic US oil production grew 70% in the last 6 years. ..Lower prices encourage companies to produce more to pays debts and dividends. ...US production is poised to exceed Saudi as the world's top producer in a matter of months. ..US importing less and less every month. OPEC failed to agree on cuts." Daniel Yergin: "This is a historic turning point. The defining force now in world oil today is the growth of US production." Oil closed $66.15 (WTI) on Nov 28, 2014.
7	**EPA Rule that CO2 is a Pollutant Held Up in Supreme Court**	The June 23, 2014 US Supreme Court ruling decided the EPA is authorized to regulate CO2 emissions as it is deemed a pollutant subject to the Clean Air Act. The ruling opinion was written by Justice Scalia, a conservative. This ruling, and the Clean Air Act, are the basis of the regulations being developed now by the Obama administration. Source: June 23, 2014 NY Times
8	**40% of Greenhouse Effect is NOT due to Carbon Dioxide**	Nearly half of the heat captured by anthropogenic greenhouse gases comes from something other than CO2. The volumes are often smaller, but the heat-trapping effect is much greater. For example, black carbon (soot) has 600x as much warming impact as the same quantity of CO2. Source: Hartwell Paper, London School of Economics
9	**IEA Projects Global Energy Demand to Grow 37% by 2040**	International Energy Agency has published a number of scenarios, but their 'central scenario' calls for demand growth to slow to 1%/yr by 2025, about half of the last two decades. The developed world demand will be flat, or decline. The developing world will increase. Source: International Energy Agency, 2014 World Energy Outlook, Executive Summary
10	**NC-REDC Region is a Clean Power 'Exporter'**	In 2010 94% of the region's grid-tied electric power was renewable. Hydro, 78.5%. Wind: 12.8% and Biomass: 2.4%. For the hydro, 2/3 comes from 1 dam and the rest from 70 smaller dams. Wind is from 5 large projects, with more to come. We consume 3.4 million MWh and export 7.6 million MWh Source: page 52-54, NC Regional Sustainability Plan
11	**NC-REDC GHG Emissions Source Profile, 2010**	40%, Transportation 17%, Residential Energy 12%, Commercial Energy 11%, Industrial Energy 9%, Livestock Source: NC Regional Sustainability Plan, page 44
12	**Solar PV is the Lowest Cost Energy Source in Many Markets**	Prices of solar modules have declined 80% since 2008. Nov 28, 2014 NY Times article says both solar and wind now

		beat conventional fuels in many markets. Source: http://www.nytimes.com/2014/11/24/business/energy-environment/solar-and-wind-energy-start-to-win-on-price-vs-conventional-fuels
13	**European Union Demand for Pellets from Certified Forests Growing Rapidly**	US biomass energy fuel exports doubled in 2013 vs 2012 to 3.2 million tones, still small, and 80% of US production is consumed domestically. 60% went to the UK. Shipping per ton from the US produces less carbon than trucking from Scotland to England. In 2013, 98% was shipped from the Southeast and lower Mid-Atlantic states. Continued growth is expected. Source: US Energy Information Agency 'Today in Energy" May 22,2014 and www.Enviva.com/faq
14	**Solar City to Invest $5b in Buffalo Solar PV Manufacturing**	The $5 billion solar PV manufacturing plant is to come online 1st quarter of 2016. It will create 1,450 direct manufacturing jobs. Hydro power from Niagara Falls was a big attraction to get the plant in Buffalo. The company also has a plant in China. Source: SolarCity.com and Buffalo newspapers
15	**Biomass Energy Projects**	There are, roughly, a dozen biomass thermal heat projects in the region's larger buildings like schools and museums. 13% of homes heat with wood. There are 3 biomass power plants including: Watertown (60 MW, recently converted from coal), Chateaugay (21mw) and Lyonsdale (21 MW). The is also one in Niagara Falls. Regionally, there are 2 in VT, 8 in NH, 10 in ME, 1 in MA and 1 in CT. There are also 31 in CA and 11 in FL. Source: biomass_map.pdf
16	**Internal Carbon Tax Being Adopted by Large Multinationals, Others**	Some global companies like Microsoft, Exxon, Shell, Walmart, GE, Google, Dupont, American Electric Power, Delta Airlines and more (50 so far) have adopted internal accounting that mimics an external carbon tax. The money collected through the mechanism is used to help reduce their corporate carbon footprint. All sorts of organizations are considering joining. Source: Carbon Disclosure Project, December 2013 report
17	**NYS Residents Believe Climate Change is Happening, but Few See Action Required**	A 2014 poll by Cornell showed that a surprising 82% of those surveyed believe that climate change is happening. But <1% think it is the most important issue and <20% are willing to take political action. Source: Climate Change Belief and Action: Closing the Gap, Oct 20, 2014 Cornell Atkinson Center for a Sustainable Future
18	**Evangelical Environmental Network Promotes Climate Change Acceptance**	Creationcare.org, a site run by 20 year old Evangelical Environmental Network, hopes to persuade governments, churches, and co-religionists to accept and take action on climate change and pollution. Clearly linking these issues back to their biblical roots, they focus on the impact on the poorest. Overseas missionary work includes the

		replacement of unhealthy, soot-emitting stoves with clean stoves – helping both the poor and the earth. Source: www.creationcare.org
19	**RGGI Has Paid $1.8b for Clean Energy Projects, 40% GHG Reductions**	America's first, market-based carbon cap and trade system has funded $1.8 billion in clean energy projects. It covers 168 power plants in Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island and Vermont. Since 2005 power sector emissions have declined 40% in the RGGI region. Source: RGGI Fact Sheet.pdf http://www.rggi.org/docs/Documents/RGGI_Fact_Sheet.pdf
20	**Adirondack Region has Gotten Warmer and Wetter Since 1900**	Analysis of continuous weather records taken at Indian Lake show that ADK temps have risen an average of .21 degree Fahrenheit every decade, and precipitation has increased an average of .19"/decade. Source: Responding to Climate Change in New York State -- Technical Report NYSERDA 2014
21	**Adirondack Temperature Projections**	Middle Range Projections are (base is 39.9 degrees) 2020s +2.3 to + 3.4 degrees F 2050s +4.5 to + 6.4 2080s +5.8 to + 10.1 Summers will be more intense, winters milder, growing season longer Source: 2014 ClimAID Update, NYSERDA et al Table 3
22	**Winter Temps Have Increased More than Summer Temps in NYS**	Between 1970 and today, NYS temps rose by 0.6°F/decade in the summer, and nearly twice that amount, 1.1°F/decade in the winter. The pattern in the Adirondacks appears to be a longer, warmer fall season with later ice-in. Spring is also earlier and warmer. Source: Responding to Climate Change in New York State -- Technical Report NYSERDA
23	**Adirondack Precipitation Projections; More in Winter, Less in Summer/Fall**	Middle Range Projections are (base is 40.8 inches) 2020s +3% to +6% 2050s +4% to +12% 2080s +6% to +13% Much of the increase will come in winter months. Late summer and early fall may see droughts. Source: 2014 ClimAID Update, NYSERDA et al Table 3
24	**Hemlock Woolly Adelgid is Already in the Hudson Valley, Central Areas**	The insect is well established in NYS, recently spreading to the central part of the State. Hemlocks are already dying in the southern and Hudson Valley areas. Currently there is no way to stop this bug. Extensive loss of hemlock forest will have cascading far-reaching effects. Methane is released from rotting wood. Source: ClimAID Synthesis Report, 2011, DEC et al, page 31
25	**Increasing Frequency of Extreme Weather Events Projected**	In the 2040-50s and by the 2080s, more days over 90 degrees, more heat waves and fewer days under 32 are expected. More heavy (1-2 inch) rainfalls are likely as well. Source: 2014 ClimAID Update, NYSERDA et al Table 5

Team Presentations of their Analysis and Event Paths

The next couple of team tasks are documented through the presentations that the teams made on the morning of the second day. For each team, we first include the original text of the endstate, then their themes, then answers to the questions and an overview of their event selections. Then we document the Q&A session followed by each team member's "true" opinion.

Team A 2040: Minimize Our Carbon Footprint

Original Endstate Text

2040 A: Minimize Our Carbon Footprint

Summary: The region is a model of low carbon footprint rural living in harmony with nature.

Context: Significant global progress has been made in reducing emissions and making clean energy affordable at scale. People in most parts of the world are changing how and where they live to lower their carbon footprint, convinced of the risk of disruptive climate change. A variety of incentives, regulations and innovations make clean energy an economically sensible choice. The auto industry exceeded the EPA CAFE standards. The airline industry reduced emissions significantly as well. Climate change is no longer a political third rail, in fact it is common ground.

Impacts: Clean energy solutions are often the low cost options. Our growing season is extended. Extreme weather hurt smaller towns more than the larger, more resilient ones. People are much more aware of their energy and water usage so conservation is widely practiced, just as recycling became mainstream earlier.

Responses: For economic, environmental and ethical reasons, the region does its part, lowering its emissions significantly. Although our small numbers mean that the impact on the atmosphere is small, our impact on political and public opinion is large. We did not ignore this. We were leaders in communicating the threat and articulating paths forward to the population at large, including farmers, hunters and tourists. There is broad support throughout the region for lowering emissions and preparing for all sorts of extreme and sometimes destructive weather. Local solutions are often creative and save money.

We broadly adopted clean energy (solar, wind, biomass, geothermal). Solar farms were widely implemented. We are a leader in demonstrating the effectiveness of NY's Clean Energy strategy. Thermal heat is largely a mixture of biomass and electric. Widespread deployment of charging stations helped with adoption of electric cars and attracted visitors with electric cars. Aesthetic issues no longer derail well thought out and designed clean energy projects, which are seen as essential to saving the landscape we love. The visibility of green energy projects are badges of honor, not blights on the landscape, and teaching opportunities for tourists. We monitor our progress in reducing emissions and focus on the next more difficult area of reduction.

The structure of our communities is beginning to change. We can no longer live so spread out. Resilience and economic development investments are concentrated in the larger hamlets and villages. The smaller towns are fading. More people live and work in the same community or telecommute. Using smart growth and revitalization grants, communities have become more pedestrian, bike and elder friendly. District heating systems are more common. Hamlets and villages attract people who want to live the clean green lifestyle. Homes in hamlets sell faster than isolated remote homes which now take a long time to sell even at depressed prices. The total population does not change much.

We also work to increase the carbon storage of the private lands through optimal forestry. Priority one is forest health. Woodlot owners see their forest differently, as their personal contribution to carbon storage. Marginal vacant farm lands are planted in trees. Our tourism infrastructure is greener than ever and focused on communicating the value of nature. Farmers proactively adapted to the changing climate, planting new crops and increasing yields, using low-till and biochar in their operations.

People on Team A

- Larry Master
- Neil Woodworth
- Ariel Lynch
- Aaron Woolf
- Michelle Howland
- Stephen DeHond

Team Analysis

Main Features

- Promotion and implementation of affordable clean energy solutions
- Benefits of longer growing season
- Larger Communities are Resilient, Smaller Towns Suffer
- Concentrating Communities = Less Energy Usage
- People Practice Water and Energy Conservation
- Rural Living in harmony with Nature
- Broad Support for lower energy emissions, lower usage, preparation for extreme and disruptive weather

Driving Forces

- Government Incentives, PURPA (utilities buy local power), grants, tax credits for clean energy, smart growth and revitalization
- Climate Impacts
- Economy
- Clean Energy Jobs
- ADK Park Culture and Community (civic responsibility, forward thinking, self-reliance, sense of place, healthy living and eating_

- Flexible regulatory environment, zoning that allows for solar farms and alternative energy
- Activism
- Technology Improvement, esp battery storage
- Model Communities built around energy/water use, livability/transportation
- Effective NGOs (e.g. Wild Center, ANCA…)

Key Players

- Government: State (NYSERDA, ESD, DOS, APA, DEC) and Local (Complete Streets, Bike Paths)
- NGOs (e.g. Wild Center, ANCA)
- Business, industry
- Woodlot Owners
- Farmers
- Educators (schools and colleges)
- Faith Groups
- Activists
- Parents, Grand Parents, Citizens
- Skilled Labor (install and maintain clean energy)
- Utility Companies

Obstacles

- Public Apathy and Inertia: we need to present a narrative in practical tangible language, e.g. alt energy saves money
- Lack of Knowledge/Vision: look at model communities, homes, campuses, businesses
- Funding: Link more heavily to RGGI and long term returns. Call it investment but link it to tax reduction, energy and community problems. Make clean energy exempt from the 2% tax cap. Create leasing schemes via the Green Bank
- Legacy Traditions: Appeal to our core virtues e.g. self-reliance, long term stewardship, enduring family connections to the region
- Technology: Innovate on power storage in ADK lakes. Link loss due to invasives, increase local power generation and local grids. Address inappropriate technology. Live more seasonably appropriately.
- Infrastructure: e.g. grid, roads, bike paths, broadband. Be inspired by big projects in history like the Interstate Highway System, the moon landings.
- Political Will Power: address funding in politics, work to make climate change supra political like public health in California, create the parade for political leaders to lead
- Regulatory Environment: e.g. the APA and local government need to get their arms around climate change

Event Clusters

The Mineville success story. The team offered a turnaround story based on green energy and location on the rail corridor for Mineville. The shift began with approval of the project to use the old mine tunnels for pumped storage to help with renewable energy growth. Other climate change grants followed. A

new power grid came online. Financing lowered the upfront cost of renewable to zero. The amendment to allow climate smart local road and utility modernization projects was passed. The region's colleges increase research related jobs. Youth are drawn to climate activism in the region. More towns sign on to the Climate Smart program.

Carbon reduction from the proliferation of solar arrays everywhere and growth of net zero housing.

Transportation is changed by electric cars with 250 range combined with plentiful public and private charging stations.

Shifts in community show up as reductions in commuting miles driven and migration from smaller to larger towns in the Park (described as similar to rural to urban but down at the scale of people moving from back country and smaller towns to larger towns in the Park.

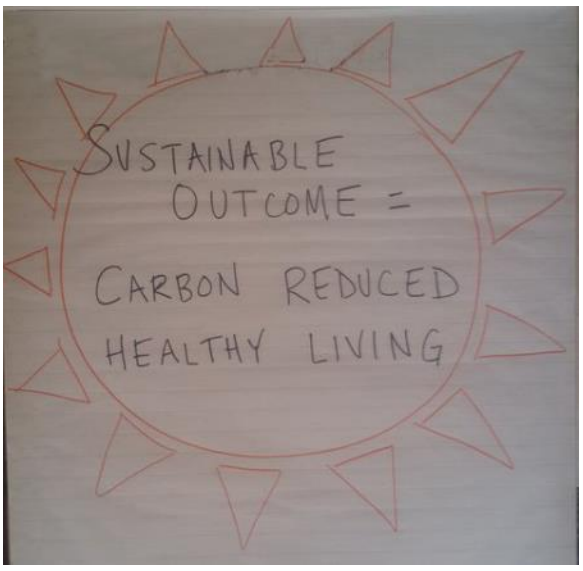
Forest Health addressed by biomass heating fuel markets for low grade wood, supporting forest improvement efforts.

Farm Health addressed by things like lo-till plans and use of bio-char for soil carbon capture. Cornell Extensions seen as important to helping agriculture address both mitigation and adaptation.

Negative events

- There was concern that coastal storms could pull lots of financial resources away from the ADK Region
- The team didn't think a massive fire was needed to spur the region to action
- Sustained droughts leading to significant lake level drops would hurt this scenario

Team Narrative as Presented



Aaron turned 86 in May, and told this story about Mineville, a troubled town.

Snow globe called Arctic City was found by my daughter. Years ago, during the iron mine operations, they tried to build a movie studio making silent films in Mineville. It didn't happen but I still have the snow globe from those times.

We had 70 degree days in January. That day the trucks came to install the big pumped storage project. It had to connect to a microgrid in Mineville and Port Henry. That led to a science fair at the school. The power switching from AC to DC led the town to become a DC town with a DC microgrid. With wind and solar, we had more power than we needed. So we used the rail corridor to move the electricity and run an electric rail project. The agriculture sector boomed. Coal was found in the old mine….mining was heritage….a referendum was held, winter, snow falling, and we the referendum ended the coal idea. So

we become the town that DC electricity built, reported by Brian Mann. Locals took the snowfall as a sign that we were finally turning things around.

----------The presentation shifted to the endstate

Our job is to show the nation, and the world, how to minimize carbon footprint in rural areas. We get funding from NYS and Washington to embrace all forms of renewable energy. We set aside some of the aesthetic issues with wind, solar, small hydro. We remake the Adirondack economy with centers for renewable energy, universal broadband, technologies of the new economy.

There will be fewer communities as people move from small towns to larger hamlets to live and work. The hurricane pattern off the Gulf Stream current changed and we do get hit. So smaller communities flow into newer better planned communities. Existing dams are useful to regulate heavy rain. Porous pavement parking lots and roads help. Multi-unit housing, district heating systems and community power help. We design for resilience. We design for lower energy needs. We develop longer growing season food crops, more Amish move in. We change forestry strategies to maximize carbon sequestration, making solid wood products, fast growing trees, not wood for energy production.

We do this at the time we are at the crest of State and Federal funding. This region, when the chips were down, developed a consensus to get the funding. We had to act quickly because we could see competition coming.

A change in living in harmony with culture. We cast off consumerism. Food is local. Energy is local. Don't need new tech, we need to ramp up existing tech. This is consistent with the current events. We constantly look for the latest tech to get to our goal and we make an economy out of it.

The Mineville story was not likely but the point of it was to illustrate how minds are changed. It has had a rough go but when you get that far down, change happens. We do the best things out of crises. The railroads and land grant colleges date to the civil war. The interstate highways came out of the Cold War.

The people of the ADKs have self-reliance in their deep cultural roots.

Questions and Answers (still in role play)

Q: What is the cultural self-identify you talked about

A: We respond to the issue of shrinking communities by trying to reinvent the local sustainable climate smart economy

Q: What changes in APA rules might be needed

A: The (actual) law called the Climate Resilience Act requires taking measures the improve resiliency. So the APA may, for example, need to allow for taller multi-family buildings. DEC has 1 million acres of State forest and it could be made into a virtue by carbon sequestration work.

Q: Who makes decision about which towns get money? How?

A: ADK political leaders have strong roles that can recognize this change need to happen for an economic argument. The trends of urbanization are not just rural to large cities. There are also moves from small towns to larger villages. Urbanization shouldn't be a dirty word. Mineville and Port Henry have pretty good urban bones. These moves happen organically, not by some fiat or decision far away.

Q: At last, being a regulated landscape might be helpful. How can we position the Park on the world stage to get attention and resources?

A: National recognition goes back 150 years. Not all the money has to come from government grants. It could come from private investors. Our water resources may be very valuable. Solar may turn out to be big. Small hydro re-starts may be privately funded. We can resurrect the fact that the Champlain basin is a UNESCO World Heritage Biosphere.

Q: Are things like high speed rail not compatible? A lot of these ideas are technical extensions. Did the team talk about this?

A: It is all about efficiency. Rail is more efficient than trucks. So being thoughtful about this is tricky. Are electric cars the answer, or how about no cars? The shift form consumerism to something else is a large shift.

Q: What is the greatest internal turnaround we may have to do? This would be a good scenario.

A: The biggest effort is we have to change the thinking of people in the region.

Real Points of View

Team members asked to step out of role play and comment on their personal perspectives

I am optimistic. I think our greatest chance of success is drawing on our quality of self-reliance. This will move towns to take steps like we have discussed

I have lots of faith in this but doubts about biomass for heating. Forestry should be aimed at solid wood products not fuel for burning.

I am a dreamer and a cynic. This would require a big disaster.

Going to require some big compelling reason for the world at large to change significantly. The availability of money is not going to happen until a tipping point brings large funds flows into this area for these projects. The 'lab model' can get somewhere. Cottage industry is green but the major areas of employment like tourism and manufacturing are not green. We need a cohesion of environmental groups from Canada to the South. We discuss the same ideas all over, then energy dissipates at scale. So a compelling disaster in needed.

I am a big fan of this endstate as doable. We should have model homes, model communities, to show the incremental cost is not that much. Often it has upfront costs. This doesn't require biomass to work. We need to realize we are all global citizens. It will be nicer here, a bubble perhaps. I worry about tipping points because we will pass them without knowing it, and there are all sorts of them. Losing ½ the planet's species isn't a good enough kick in the pants. A forest fire will not be enough. Education is the key to all of this.

I like the clean energy, food, farm community stuff. I am troubled by it depending upon the global environmental movement happening because I don't see it yet.

Team B 2040: Community Resilience

Original Endstate Text

2040 B: Community Resilience

Summary: Obvious signs of damaging climate change coupled with delayed and insufficient global response lead the region to prioritize investments in resilience.

Context: More than half the countries of the world, including the US, missed their 2040 emissions reduction targets. It is now clear in 2040 that average temperature will rise by at least 5°C and CO^2 levels will exceed 600ppm in the coming 25 years. Severe weather events, droughts and fires trigger significant national migration from south to north and from water's edge to high ground. Improved climate modeling has put higher probabilities on the "black swan" extreme events, those more than three standard deviations from normal.

Impacts: Climate change has done real damage to the region both ecologically and economically. We begin to worry that the long-term picture is large-scale destruction of the landscape we love. The winter tourism economy is already severely reduced and shrinking. Traditional food production like apples and maple syrup is gradually diminishing. There are more, and worse, ice storms, floods, forest fires and destructive invasive species. Warming accompanied by repeated freeze/thaw cycles caused serious agricultural damage. Loss of snow cover coupled with deep freezes damages fine root systems, killing trees. Long summer dry spells challenge agriculture and hydro power facilities. In response to disasters elsewhere, new people have moved here in pulses, putting strain on infrastructure and housing. New infectious diseases like West Nile virus and tick-borne illnesses are here now.

Responses: We invested heavily in infrastructure resilience, seriously hardening roads and bridges, communications and power networks, emergency response and healthcare systems. Many buildings in flood zones have been raised on stilts, moved, or bought out and razed by FEMA. State policies call for rebuilding better after each disaster with an eye to the long-term changes. Access to accurate GIS data makes it possible to see which solutions provide the best protection. Wireless communications systems (cell and emergency response) are ubiquitous. More redundant and decentralized power systems are critical with so much bad weather. We piloted and deployed distributed clean power and microgrid

technology and prepared for more air conditioning. Local government focused on emergency preparedness and improving resilience. Clinics and hospitals prepared to recognize and treat new diseases. Investment in resilience created many new local jobs. Resilience became the new self-reliance. We know we will get hit, the goal is less damage and fast recovery.

Private land use policies changed to move development away from flood plains and other dangerous areas. We worked as best we could to protect our natural resources. We have established quarantine procedures with all necessary permits in place to strike quickly against invasives upon their arrival. Remediation work in lakes and wetlands also was a source of new jobs.

Mitigation has support in the region only if it cuts costs. We did the economically sensible investments, but are still dependent on fossil fuels in many areas such as transportation and thermal heating. Our politicians vote against higher carbon pollution costs, saying the load will fall disproportionately on the rural population. Adaptation and resilience use most available funding, but there is strong competition for these funds as other parts of the State face their own threats, most notably seal level rise on Long Island. Our early proactive investments were critical because they got us ahead of the curve before intense competition for resources really set in.

The People on Team B

- Hallie Bond
- John Sheehan
- Margaret Irwin
- Bob Stegemann
- Colin Bier
- Jennifer Bine

Main Features

- Scenario focuses regional response to things we can control – adaptation rather than mitigation.
- Resiliency efforts protect our core businesses and assets – they also serve as an economic engine moving forward.
- Scenario reflects a shift from reactivity to productivity with the resulting sustainable response.
- Scenario protects, and relies on, the ADK natural landscape.
- ADK resiliency benefits everyone “downstream”. There is competition for funds with “downstream” communities.
- Park regulation / regional identity / culture of stewardship / existing community action = paths to local resiliency action.
- Go Team!

Driving Forces

- Mitigation of risk and change
- Need for monitoring long term change

- Health, safety, economic damage potential
- Attachment to the Adirondacks
- FEMA Insurance
- Business, Community, Tourist Economy
- Emergency Responders
- Agriculture
- Forest Products Industry

Players

- NY State, DEC, APA, REDCs, Dept of State
- Environmental NGOs
- Local Government
- Common Ground Alliance
- Federal: FEMA, FWS
- Utilities
- Environmental and Civil Engineers
- Ecosystem Scientists

Obstacles

- Funding needs to be broadened beyond crisis response, lack of local funding for proactive projects
- Complexity of needed response from regulatory agencies
- Doubts about climate change
- Long and short term thinking affecting willingness to respond
- Observing change and predicting the future
- Communicating up to decision makers and out to the public
- Shift from reactive to proactive mode
- Risk from changing unpredictable leadership, Federal and State
- Downstate and coastal communities viewed as having higher risk
- Other, non-climate related risks
- Complex existing land use of the region (State and private lands)

The World in 2040 – Grandpa

Extreme weather events are happening

Chronic climate change impacts are seen

Adirondack Resilience = Acting on the Things We Can Control

Grandpa: 'I hope we did ok, now it is your generation's turn'

Child: 'Don't worry, we'll be ok, we'll deal with it'

Event Clusters

Local Buy-in and Actions: Lead the train, can call to action (Climate Plan and Summit)

- AATV Convenes Extreme Weather Summit
- Towns Sign on to Climate Smart Programs, Board Training
- Schools, Camps, Clubs of all sorts, gather climate data, form volunteer corps
- Ice Storms, Floods and Fires Combine to be the Wake Up Call

Funding Fuels Shift to Adaptation through Planning and Grant Support

- FEMA Grant Rules and State Law Shifts to Better Support Adaptation Projects
- Amendment Allows Climate Smart Road and Utility Projects
- Habitat Connectivity Projects are Funded
- Resiliency Zones and School Based Shelters are Set Up
- Communities can't deal with all this alone. They need to act regionally and in concert with State and Federal government

Research for Preparation Planning, Practical and Solution Oriented

- We get Detailed Sub Region Specific Climate Models
- The Region Itself Becomes an Object on Intensive Study, Lots More Citizen Science
- Cornell Extension is Actively Working Mitigation and Adaptation Opportunities for Farmers
- We get new, accurate, flood insurance maps
- We are experiencing big problems with synchronization, phenology
- Invasive Species Quarantine Plan Activated

Communities Target Resilience Projects

- Green infrastructure, preparedness, emergency response plans
- Towns are successful getting map amendments to deal with climate change issues
- Young people are serving on more town boards
- Land owners and lake front owners make informed, climate smart decisions
- Gardens and Farmers do well, managing runoff, improving soil health
- Adaptation is big business in the region, creating new opportunities and jobs

Business Response

- Massive expansion of investments in the water sector
- Insurance companies offer 'green' replacement policies

Power

- Wood fueled co-generation brings power and heat to large complexes
- Potsdam's Micro Grid is Operational
- Plattsburgh Gets New Employers Seeking Green Hydropower Sites
- Solar Arrays are Showing Up All Over

- The Grid Handles Lots of Electric Vehicles Well

Events that Would Hurt this Endstate

- A Big Fight Over a Solar Array Cited in Keene, or a negligence law suit against a non-responsive town
- 3 No Snow Winters
- Abandon Industrial Forest Added to the Forest Preserve
- 15% of Seasonal Homes Occupied Year-Round
- Droughts Lowering Lake Levels Too Far
- Coastal Storms Pulling Resilience Money Downstate
- Ticks and Poison Ivy All Over

Team Narrative as Presented

Our scenario focuses on the things we can control: adaptation and resiliency. Protecting our core businesses and assets including the natural landscape. We are not so into mitigation activity. All the work involved in resiliency, adaptation and recovery is an economic engine.

The team staged the grandfather / granddaughter exchange noted above.

The general positioning of this is to describe us as coping with what comes, working on efforts that allow us to recover from storms quickly. There are ice storms, big fires and repeated flooding events. Individual communities can't cope on their own, but we set up resilience zones, and make grants to repair stuff smaller and easier to obtain.

Research for preparedness planning – practical solution oriented work – gets funding. The climate does change and we track everything we can possibly track.

Communities identify resilience projects themselves. Map amendments are common. Agriculture grows. The power industry moves to micro-grids. Co-gen wood systems are built at large complexes.

There are typical fights of locations of solar arrays, towns getting sued for flood plain issues and the like but we cope with these issues, we don't get knocked over by them.

Questions and Answers (still in role play)

Q: Does NY State money go away?

A: Not if we stay together in our messaging. We do have to keep the coastal cities from getting all the money. We can position the Adirondacks to be seen as a laboratory, the larger landscape protecting us from storms. Some communities will get out front with resilience plans.

Q: What about our water in this scenario?

A: Water will become a more important ecosystem service. Like the Catskills NYC watershed, our watershed is viewed as more important now.

Q: Sounds like you won't have funds to support the schools. How do you keep funds flowing into this region?

A: We think this is a big issue. We just have to compete with other regions and interests. The fact that we are the Adirondacks does make us special. The really tiny schools could blossom into major sites with advanced climate curriculums.

Q: If Long Island and NYC flood it is inevitable they will take 90% of the money. What do we do?

A: Then we ought to front load the hardening of our infrastructure now. The bigger the project, the more important it is to get rolling now. We probably have to give up on some communities that cannot be made safe, so we'll consolidate some schools and especially emergency response.

Real Points of View

Team members asked to step out of role play and comment on their personal perspectives

This kind of stuff has to happen. We need a combination of regulation and markets to make global change. If we kick start the private capital system we will move ahead – RGGI is a working example.

This one is best suited to the mindset of living in the Adirondacks. They are practical, frugal and these characteristics translate into these types of actions. We value our independence. We do what we need to do. We want a sustainable future.

I was discouraged by this because it does not address mitigation. I am more hopeful about the small towns where being self-sufficient is what we are about, people off living by themselves.

I think this is likely, and pretty desirable. It is suited to our culture, acknowledges government is not moving to address this. So, let's do this at the very least, but let's do something else too. This is a 'yes, and…' scenario, not enough by itself.

This is a no-brainer, but if bad things happen down state, the competition for funds will be huge. We might be better able to cope than other regions w/o a lot of State money – which is good as we might be left on our own. Need education. Need advocacy. This is just plugging the holes, progressive and smart, but it does not change the big picture, the core problem, so it is not the long term solution.

Team C 2040: The Hyper-Green Human Refuge

Original Endstate Text

2040 C: The Hyper-Green Human Refuge

Summary: Our protected landscape has been resilient to the worst effects of climate change and the region actually experiences something of a boom. It is far better here than other places.

Context: Climate change is part of a larger set of environmental concerns that have fairly broad public support. Protection of nature and economic/environmental justice issues are major concerns of most religions. The whole southern tier of the US was far more damaged by climate change than the north.

Impacts: Climate change has been relatively kind to the region. Longer, warmer spring, summer and fall seasons more than made up for a shorter winter. Heating bills have gone down. We still have snow, but fewer snow cover days. We continue to have plenty of water. The forest is remarkably resilient. Sure, the balance of species has changed, but overall biodiversity has increased here and it is a fine destination for hunters, fishermen and hikers. The milder climate made the region more attractive to retirees, tourists and people fleeing the sweltering south. There was significant in-migration, including more businesses and farmers pushed northward by the climate. Certainly many long-term residents and visitors experience the changes as a loss, but the new immigrants think it is a delightful place to live. The problems are real (e.g., more infectious diseases) but they can be dealt with (as more southerly regions have dealt with them historically) and are more than balanced by positive changes.

Responses: We doubled down on our commitment to environmental protection and living sustainably, reinforcing our green brand. Climate change is embedded in planning and policy processes - part of a broader environmental ethic. It isn't really front and center, just one of many environmental issues that include water quality protection and forest restoration. We continue to increase our recycling and composting. We banned plastic bags and cups. We increased our shared transport options and they are used more, especially by younger visitors. There are many more buses and trains providing access to the Park. Visible clean energy projects were welcomed and brought new jobs. We aggressively kept out invasive species and invested heavily in water treatment and storm water management.

Our recreational offerings shifted to nearly year-round golf, fishing, canoeing, hiking, etc. Winter sports venues invested in green refrigeration and ways to use their sites at other times of the year. We played up the wellness aspect of our region as a destination, a place to rejuvenate and re-experience nature.

More farmers have moved in as a portion of the nation's agriculture relocates from drought-challenged areas of the West and South. They have been able to shift crop and animal varieties to increase production, while reducing their environmental impact. The wines of the region are getting pretty good.

As in-migration picked up, the year-round economy improved as well. Fewer people go south in the winter. We anticipated the boom and set land use policies to enable more housing but not to the

detriment of the Forest Preserve or the back country. Most new residents prefer the hamlets and villages not the backcountry. Our broadband infrastructure enabled people with jobs in less habitable climates to live here and work there.

Area churches deeply engaged with environmental issues. Ethical, moral and spiritual engagement with environmental protection proved to be much more effective than scientific reports and angry political movements. Today we mourn the imminent loss of the Everglades and the more fragile western forests, but celebrate the role of this region in providing a sanctuary where humans and nature adapt and sustain each other.

The people on Team C

- Bill Brown
- Stephen Dana
- Ray Curran
- Patrick Nelson
- Monique Weston
- Carla Smith

The Main Features of the C Endstate

- The region is lucky, blessed, to be a protected landscape in the Northeast that fared better than other areas. It experienced predictable changes
- The region experiences an economic and population boom, a quality of life boom
- Smart growth, adaptability and connectivity, "green branding", focused on living in hamlets
- Institutions and the public embrace the stewardship culture. Institutions include churches, civic, environmental, business and government
- Inclusivity to climate/economic refugees

Driving Forces

- Other areas had negative impacts from climate change
- DEC and APA history of landscape protection balancing nature and human communities
- The stewardship culture of the region, pre-existing climate change
- Education and communication

Players

- Recreation clubs like ADK Mountain Club, ATIS, etc
- Environmental organizations
- Churches and civic organizations
- Local and County governments
- The APA and local planning boards
- In-migration populations
- Colleges and high schools

- Olympic Region Development Authority (ORDA)
- Tourism board and hospitality businesses
- Farmers, Cornell Cooperative Extension Bureaus
- Entrepreneurs
- Business community and Chambers of Commerce for infrastructure, tourism, and agriculture services

Obstacles

- Funding
- Political Support
- Infrastructure: broadband/4G, roads & bridges
- Extreme weather events
- Need for the community to work together
- Avoiding the hubris of individuality
- Avoiding the fear that outsiders might lack stewardship values
- Over development
- Greed
- Outside interests
- Fatigue?

Event Clusters - Positives

- Lucky and Blessed – food and agriculture
- Communications
- Education
- Institutional Support at Multiple Levels
- Infrastructure and Energy
- Transit
- Ecology
- Support and Funding
- Planning, people and community

Event Clusters – Negatives

- CSA Ag out of Favor
- Resource Exploitation – NIMBY
- Environmental, ticks, poison ivy, synchronization issues

Team C Narrative as Presented

We have changed climate, but it is not the disaster it is in the US Southwest and Alaska. It is warmer and wetter. There are some ticks and other bad things but it isn't too bad. We are lucky, blessed that it will not overwhelm us here. We are living with pretty predictable changes and we are doing smart planning.

Sea level rise does drive people away from the coasts – they simply cannot stay there. We get a small population boomlet, more year-round residents, more kids in the schools. We brand ourselves green, and residents generally prefer life in hamlets to life in the back country. Churches and civic organizations are involved. We see climate and economic refugees moving here.

Local political leaders are raised with a stewardship focus. Our forests and communities prove to be resilient. We have issues with people arriving from cities. How do we give them our sense of stewardship? We do anticipate how to expand hamlets and housing wisely. It boosted our economy in good ways. There is a general sense that this has bene a source of jobs. Climate education programs in high schools and colleges train people for related work. We did not have big natural disasters.

Energy, communications and transit are the 3 big issues. Microgrids get built in the region and there is lots more solar and distributed generation. We recover fast from storms we do get. Solar arrays are not viewed as eyesores but instead are appreciated, a way to show off self-reliance. Broadband internet and cell service are all over the region. Electric cars are growing and lots of charging stations get built. Fleet of autonomous vehicles make car-free living work here.

The efforts of government, the private sector, churches and education work together well in a healthy dynamic. Sustainable economic growth is the key to the entire plan.

Questions and Answers (still in role play)

Q: Did you consider retaining rail service?

A: The rail continues to operate but the fleets of autonomous cars are the way people get around.

Q: You are sugar coating the way things are. The forest may be ok, but we only have brook trout is a few streams. The critters are experiencing losses and the tourists that come to see them no longer show up. So what do we do?

A: Disappearance of species was not touched on in the endstate, but new species do show up as old ones move north. We are in better shape, with more species than before. The protection scheme remains and there are plenty of institutions that look to care about local ecology.

Q: How do we deal with cultural diversity that new residents bring? How does the Muslim prayer hour go over in Tupper Lake?

A: The newer religions and recreation groups become aligned with the Common Ground idea that the underlying thread is stewardship. We are prepared for new migrants.

Q: What else, besides tech jobs, do we have to offer?

A: We are in an agricultural boom, so there are lots of farm jobs. Tourism and the arts get better. Beyond survival, these are quality of life jobs. Ag, tech and tourism/arts are our sectors.

Real Points of View

Team members asked to step out of role play and comment on their personal perspectives

There is potential for this to happen, but it is not wise to assume that. The idea of a wage based economy may not work well here. If we grow our own food and power, we are likely to better sustain ourselves, more of a Jeffersonian via than a Hamiltonian view.

This one is the most work, needs to be thought through. It takes many approaches and diverse efforts, diverse players, to make this work. Getting to the kumbaya moment is hard.

Agree that the Northeast is not so badly hit. Anticipating and planning for these changes are more about values than economics. But accepting that we are OK, in our regional ark, is not an OK attitude.

This is polyannish. There are true political risks and we have to really address the challenges. Things could change dramatically in 25 years. What was life like in 1990? Will our technology evolve fast enough?

If we don't act with some urgency we won't get this. The geopolitical stresses well beyond here makes it hubris that we can be OK while many other regions are not. We will still feel the impacts of global changes.

This is attainable, most likely. But it could be unseated by global pressures. Another big storm is something the scenario is not counting on. Global carbon taxes are not happening, fossil fuel is still really cheap. This is unsettling.

Even this scenario makes me sad. I am more pessimistic. The global dimension is overwhelming and unrealistic. The drought in the western US will disrupt the whole nation.

Team D 2040: Rise Up and Demand Change

Original Endstate Text

2040 D: Rise Up and Demand Change

Summary: The national/global protest movement for climate action is strong in the region.

Context: A global struggle arose to wrest policy control from the fossil fuel companies and their lobbyists. Protests started to turn violent in parts of the US (e.g., Berkeley) and Europe. This civil society uprising finally forced a serious national discussion on the true risks and the needed policy changes.

Impacts: To the younger generation the reality of climate change is not for debate, having learned the science and its implications since grade school. More and more became radicalized as they saw insufficient action from aging boomers who seem still under the sway of the fossil fuel complex. Area schools are the center of this vocal protest movement.

Responses: Although it took a while to build, a coalition of young people, college professors and environmentalists in the region came together and began to raise its voice. Stopping oil trains traversing the region were an early target, so crowds took to gathering on the tracks. Next came widespread support for the divest movement from area schools and non-profits. There were meetings and rallies throughout the Park that grew slowly in numbers and vehemence. Town and village boards were forced to take action if members wanted to keep their jobs. Something similar to the Common Ground Alliance was formed to bring specific proposals to Albany and then Washington. High school students became more vocal and passionate about this cause than ever before. Sessions at the Youth Climate Summit include political action strategies and influencing elected leaders. Young people educate their parents and older siblings. Young mothers and retired activists get involved. Everyone is talking about climate action and what to do. Finally, this is a top of mind issue here.

The science and research community of the region became much more active politically. Science, well communicated and connected with policy, turned public opinion and stirred leaders to act decisively. Similar to how the region's lakes became a national icon that helped to rally action against the harmful effects of acid rain, it's our regional science that helped galvanize action in New York State to stop these harmful climate changes. We sought and received funding to expand monitoring and experimentation, much of it coming from the region's robust philanthropic community. The results, on display in educational exhibits throughout the Park, strongly reinforce and make tangible the impacts already happening in our forests and lakes. Citizen science projects extend monitoring with the help of students and the early retired. The scientists here are trusted local friends.

Research programs at area schools are focused on some aspect of either mitigation or adaptation, from reforming the power infrastructure to establishing and protecting wildlife refugia. The gentle urgings to be more sustainable have turned into strongly worded calls for serious emissions reduction. Shaming polluters and laggards is a favorite tactic of the social media savvy younger generation.

Well-placed Adirondack environmentalists engaged strongly in national and international efforts at systemic solutions to emissions reduction. Images of devastated forests and fouled waters devoid of iconic birds like the loon motivated the network of influential people connected by generations of family to the region to lobby governments and contribute to foundations. They saw this as the only way to prevent a real catastrophe. Leaders here, long ago, invented the idea of protected wilderness for the planet, and now they have invoked that same kind of statesmanship in this battle to save the planet.

People on Team D

- Sherm Craig
- Lisa Adamson
- Naj Wikoff
- John Collins
- Gina Fiorile
- Andrea Mitchell

Main Themes

- Adirondacks Park is still Forever wild with a diverse resident and visiting population
- Enlightened leadership – climate change influences policy making
- Diverse group of watchful citizens (policy and science)
- New economic model reflects new climate
- Environmental science from regional colleges valued
- Youth, K-post graduate, moving to the area.
- Adirondacks viewed at influential national and international model

Driving Forces

- Connection among generations
- Failure of political leaders to tackle climate change, resistance of wealthy, new generation of leaders
- Above ground, visible action by lots of people
- Underground action by those making it happen
- Science and education community becoming involved (e.g. Paul Smiths College, Curt Stager)
- Possible triggers: oil train accident, fracking accident, Forever Wild clause repeal

Players

- NGOs
- Government
- Climate Activists, diverse, grass roots
- Spiritual leaders

Obstacles

- Inertia, fear, Immediate problems of regular life
- Involved people are maxed out
- Too late, no time
- Forces working against us, the Koch brothers
- Failing economy
- Funding
- Population extremes

Team Narrative as Presented

Civic actions on climate change have become more radical. In our region, oil trains are stopped by protesters. Youth partners with scientists and museums for better research and education. Mitigation and adaptation are part of the generalized activism. Adirondackers are getting involved in global and national politics advocating climate change policy and becoming leaders in sustainable development.

Part of our project is to make you part of the movement. Science and education, colleges, youth and some old folks too. Our flag (below) is the forest on fire. 50% of schools have climate watch programs.

Divestment strategies pick up support. Churches get involved. Deniers face social ostracism. The science does get better.

The raging grandmother looking back sees successes in direct action, civil disobedience, underground radio stations, an organized progressive political base, town meetings pulling in all sorts of people from all classes including native peoples and those with survival skills needed in extreme situations.

Flood, food price spikes, huge fires in the High Peaks, long droughts from the shifting jet stream. These dramatic events are what get people's attention. The water in our region gets more attention as a needed resource in the cities. Huge public rallies, protests and sit-ins develop world-wide as the change is upon us. Now we feel attention has changed and legislation is at hand.

This only works after the extreme losses are apparent. Oil is left in the ground. The economy is no longer built on growth.

Eye Opening Events

The team selected a list of events they felt would serve to get attention of people. The 3rd big flood in 5 years, a massive forest fire (the team's logo), a spike in food prices, ice storms, citizen science engagement, hunting and fishing restrictions, hamlet's making decisions not to rebuild after a disaster. These sorts of events would get the attention of different groups of people. Disasters are only one type of these events – others could be human made like getting the Dali Lama or the Pope to visit here.

Education and Science Background Events

These were all the events about students, youth camps, the Wild Center's programs, churches, the group actions that can turn this into a wide spread social cause.

Also included were divestment campaigns, improving downscaled modeling about impacts, and the idea that youth can be drawn to the region, signing on to the efforts to make a difference here.

Questions and Answers (still in role play)

Q: Does this work?

A: Well the measured approach did not work. It took the drama of huge fires to create Article 14 and similar fires are what made this finally happen. Lulling people into complacency with lower gas prices,

and recycling, actually delayed and hurt in the long term. The pragmatic data collection helped but the drama is what forced the change. When NYC flooded, it got Cuomo's attention.

Q: What changed politically?

A: The students of the 2000s grew to be the leaders.

Q: What if the disasters were not here, but in the 3rd world?

A: Big 3rd world disasters would have resulted in refugee streams as a wakeup call. But something closer to home and more immediate would have more impact here.

Q: This seems like a lot of improbable events.

A: Well this could lead to violence and that could further polarize. So the community has to get galvanized by some event. People with money have to get hurt somehow by climate impacts.

Real Points of View

Team members asked to step out of role play and comment on their personal perspectives

This is a scenario that I agree with. We need more urgency and action plans.

We are losing life forms, seeing extinctions, due to climate. Still this has not made people change their lifestyle. So something big in the US is needed to wake people up. Something will happen that gets this response.

People need to feel more urgency. It will take a long time and a series of dramatic events.

Activism will have to be used if you are going to change attitudes. The science is there, but the will is not there. Oil train disasters could be it.

The pragmatists in science and education are part of this but it is going to take a big event.

Education is one of the most important things. It is hard to train old people, but young people are easy. Activism is really important. The research side of this scenario is very important.

Climate change could flip as fast as gay marriage. Not sure how radical the activism needs to be.

Research universities are key

Attitudes can change. Do the teachable moments have to be quite so devastating?

Team E 2040: Pragmatic and Measured

Original Endstate Text

2040 E: Pragmatic and Measured

Summary: We make sensible "no regrets" investments and do not overreact. We learn as events unfold and avoid over-investing and making inappropriate choices.

Context: Climate continued to change in fairly gradual ways and no tipping points were passed. Clean energy continued to improve in terms of cost, efficiency and shorter pay back periods. The business sector pursued many opportunities in efficiency, fuel switching and resilience. Population migrations have not been a big issue in the US. If you live in air conditioned comfort, you can handle more days over 100°. A variety of technological innovations help farmers and the public cope with drought throughout the South and West.

Impacts: There have been many changes in the forests and wildlife, some of it kind of ugly. But ecosystems have always changed and pests have routinely come through the region. Things are different but not terrible. There are storms and damage, but the land and waters recover, often remarkably quickly. Humans and nature turned out to be more resilient than once feared.

Responses: We did what made sense economically. After years of unmet commitments by cities, states and nations to various reduction targets, lower energy costs are what finally drove fuel switching and energy efficiency projects. Investments that made power and communication networks more reliable were clearly beneficial and got done as money became available. Investments in more resilient infrastructure typically came after a big storm, not proactively. When the old firehouse was destroyed, then you built a new one on high ground. There were no programs to aggressively move facilities out of flood plains in anticipation of floods, for example, but higher flood insurance rates and updated FEMA policies guide rebuilding after a disaster.

We took advantage of grant programs that came our way to improve infrastructure and pilot new technologies. Continuing limits on property and sales taxes made it hard for communities to make major investments in either mitigation or adaptation without outside assistance. There were many other problems to work on - investments in education and health care were at least as important as investments in clean energy and resilience. Typically, projects were justified on the co-benefits like cost savings, higher reliability, public health benefits, etc.

The Forest Preserve was left unmanaged. We limited harvesting of private forests for wood energy and don't export pellets from the region. Height limits stop wind projects, fights over views stop solar PV array projects. The tourism industry coped in various ways as they always have. We still worry that out-of-control 'response' projects will do more damage than climate change itself, not to mention costing money we don't have.

The general population here had an intuitive understanding that the climate was changing. They really couldn't miss the changes. Since people here are more connected with the outdoors and nature, they experienced it firsthand. So there was no big political fight. People were kind of turned off by the prophets of doom and scientists that stressed the most extreme scenarios in their models. There has been no huge change in how we live or how we recreate. Everyone is counting on future changes to be as slow and moderate as they have been in the last 25 years.

People on Team E

- Annette Craig
- Ethan Pierce
- Bob Hest
- Robert Snyder
- Ezra Schwartzberg

Main Features

- This endstate is similar to today's environment
- Low government interference
- Rate of change is viewed as constant and manageable
- Continued innovation drives technology
- Good data capturing helps monitoring
- More programs available to improve infrastructure, conservative approach to municipal government.
- Gives people time to be educated
- Resistance to giving government more control means government restraint
- Risk is high for environmental degradation

Driving Forces

- Desire for more complete data to make better informed decisions
- Placement of greater importance on people's quality of everyday life than on preventing low-likelihood environmental extremes
- Allows people to make decisions personally and freely
- Incentive programs accelerate technological innovation and adaptations
- Corral money to meet our endstate
- Optimistic capitalism

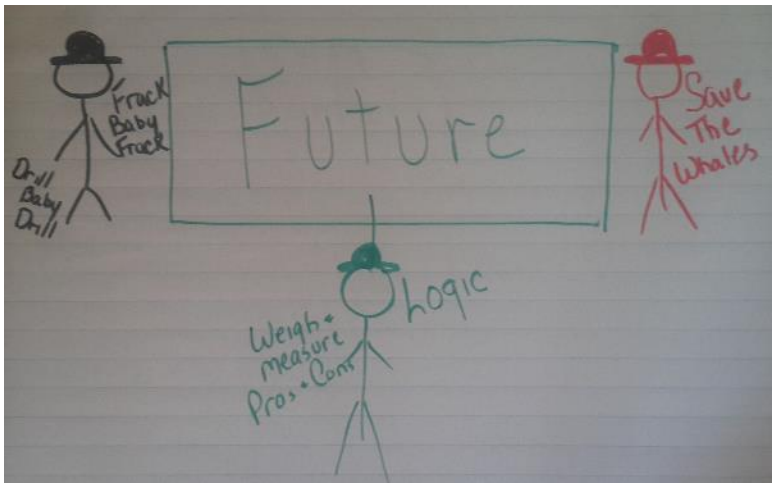
Major Players

- Government Incentives, not dis-incentives
- Consumer preference
- Social and economic sustainability
- Business

Major Obstacles

- People loudly creating polarization
- Greedy capitalism
- Other nations not incentivizing or regulating their industries makes their goods cheaper
- Radical politicians
- Radical activists
- Reality has tipping points resulting in chaos – conclusive science in 10 years pointing to a crisis

Team Narrative as Presented



While we certainly saw changes on the horizon, we did not want to over react. We take droughts as warnings, invest in fire department equipment and training. There was a fire in the high Peaks, but it was only 600 acres. Fires are not a big deal. The world is not on fire. Their picture shows them in the middle between two extremes of still full speed ahead on fossil fuels or on the other hand too liberal.

We don't take drastic actions, or enact excessive regulations. The climate is changing slowly. The private sector is doing quite a lot. Renewables are cheaper than oil and coal, good examples of private sector progress. The changes needed will be doable, with measured steps, not too different from today's situation.

There are natural disasters, but we've seen them before. No obvious tipping points have been passed.

Another area of activity is gathering more data from all sorts of climate monitoring efforts so we can make better decisions.

Political trends are focused more on everyday life, not worries about very low probability events. The intention is to allow people to make personal decisions and use incentives to accelerate technical innovation. We call it optimistic capitalism.

We invested in winter sports refrigeration and got by with this. Low snow in other areas meant more skiers visiting here. This was another example where we knew this was coming so we prepared for it. But we did not over burden people.

We are not saying the science is wrong, but we don't agree with the scare tactics. Higher bridges are sensible investments. People take comfort from this sort of work. Stability sells.

Questions and Answers (still in role play mode)

Q: Who decides what is a "reasonable course of action"?

A: The IPCC is in the polarization category. We think this is pushing fear. They keep changing their measures, and that will continue. Climate is a very complex system of factors and we still need much better data.

Q: When the small town economies collapse due to 3 no snow winters, what is the response?

A: It not completely without snow. There was limited snow cover. We knew this was coming so we provided alternative recreation – invested in biking and sustainable ATV trails. The world is not going to act just so we have snow in our area. We get ice more than snow, curling grows. We have moved to be more proactive. We are not ignoring the situation.

Q: How do you empower individuals in the event of a weather emergency?

A: We are more prepared. Our infrastructure is better. We did move structures after storms. We are learning as we go. We still have a decent standard of living in the US.

Q: What about the developing world?

A: We focus technical innovation so we get the developing world cheap effective energy enabling them to leapfrog their way ahead. It is like what happened with cell phones in the developing world. This will be another leap for them.

Real Points of View

Team members asked to step out of role play and comment on their personal perspectives

I am concerned about how the world is going to cope with this. Here, we may be sheltered from climate change. Impoverished areas of the world will suffer the most. We have to think like global citizens to address a global problem.

To solve problems you need to organize. The corporate model is the organization structure best suited to do this. As you learn, you encounter solutions to solve the problem. Creating incentives to change behaviors is what works. I believe in this response model.

I don't trust green capitalism to do the right thing. Big corporations are greedy. We as consumers have to demand change. Then they will produce the right products. They don't do this altruistically. We need to be more proactive. The next generation is key.

I like this, but I like other endstate too. This is a component of the whole situation. This endsate ignores the ecological impacts.

Unfettered capitalism helps, but it is not the only solution. Sensible regulations will help drive resolutions. CFC control are an example where regulations led to innovation and changes. We should be pragmatic, but when the tipping points come along, pragmatic does not work.

Team F 2040: Reaching a Regional Tipping Point

Original Endstate Text

2040 F: Reaching a Regional Tipping Point

Summary: The region is being severely impacted and there is significant depopulation as global responses to the threat of climate change are insufficient.

Context: The world's political systems were not able to muster a sufficient reduction in GHG emissions to prevent damaging warming and eventual sea-level rise. New sources of fossil fuels, ironically some that are made accessible because of melting polar ice and permafrost, keep the supply high and price low. This severely undermines fuel switching efforts and lengthens payback periods for clean energy investments. The weather is getting really bad; extreme weather happens more frequently.

Impacts: There has been extensive damage to the forest due to ice storms, floods, droughts, fires, blow downs, pests, pathogens and invasive species infestations. The forests are declining, converting stored carbon through decay to greenhouse gas emissions, tipping the balance from sink to source. Smoldering, hard to extinguish fires, formerly seen only in places like Indonesia, dump volumes of CO2 and black soot into the sky. Air quality is frequently bad.

Community infrastructure has been routinely devastated. It has been hardest for small, poorer towns and small businesses to recover and many people moved to larger towns or cities to reduce their vulnerability. Cities offer the lowest carbon footprint and the best resilience against bad weather. Back country living became increasingly difficult, expensive and less attractive. Tourism is also down as the waters are increasingly fouled and recreational infrastructure slow to be repaired. In these dire times, the Park is a luxury that NY State can't really afford and voter support is waning. Huge costs for recovery and adaptation in the bigger cities of New York State drain dollars away from this increasingly depopulated region. Our already fragile communities are on the brink of collapse as fewer and fewer people want to live here because it is so hard.

Responses: Over the last 25 years lots of programs have been started but none really took a major bite out of our GHG emissions from buildings and transportation. When changes required major investments or behavior changes, they just didn't happen.

Town leaders found it hard to plan and prioritize adaptation efforts since there was so much confusion about what the local impacts would be. First, they were told it would been warmer and wetter, then colder and drier, etc. So decisions and major efforts were postponed.

Financially attractive energy projects got done but then subsidies dried up and progress slowed. When it was a question of going into debt, projects didn't happen. A large segment of the population didn't want to get rid of their old wood stoves or make an investment that pays back over 20 years. And our region's efforts at mitigation weren't going to solve the problem anyway.

There is a growing sense of panic but now it's too late. We've passed a tipping point for our communities and decline seems unstoppable. There is a pervasive feeling that our best days are behind us.

Team Members

Dave Mason
Jim Herman

The workshop facilitators, Dave Mason and Jim Herman, presented a defense of this endstate. This intentionally depicts the generally expected consequences of a societal failure to do enough to slow, stop, or turn around emissions trends. We did not think workshop attendees would want to spend a day and ½ working on this. However, in preparing a reasonably complete set of scenarios it is important to include one where we do not do the things needed to avoid a disaster here or elsewhere.

In the past, during the original ADK Futures Project, some environmental groups were critical of us pointing out routes to failure of the whole concept of the Adirondack Park. It is not our intent to advocate for failure. It is out intent to learn how a major failure might develop. The goal is to enable us to see a developing failure early enough to takes steps to avoid it. That is our purpose for including this endstate in the mix is to enable us to see this coming early and escape this outcome.

Main Features

- World political leadership does NOT succeed in addressing emissions
- Extensive damage to our forests and infrastructure develops
- Repeated hits by major storms 'tip' more fragile hamlets into partial abandonment.
- Reconstruction is not completed before the next storm. Repairs cannot keep up with damage and people leave.
- The weather is not nicer, the damage is not pretty, and tourism is in decline
- Local governments do not plan for climate change. They say that the uncertainty of actual impacts makes decent planning too difficult
- Financially successful projects, like solar PV that save money succeed but these steps are not enough

Driving Forces

- Plentiful, cheap, fossil fuel sinks lots of renewable energy projects. The ideas that peak oil, or expensive oil would help divert people to renewables is no longer valid.
- Citizen apathy
- Local Government inaction

Obstacles

- Environmental Concerns
- Our 'Better Angels' Won't Let This Happen

Event Clusters

Lack of Progress on Energy

- The program to swap wood boilers for high efficiency units doesn't gain traction. The whole biomass effort fails to build any scale.
    - Aesthetics of View Sheds Leads to Conflicts About Solar PV Site Permits
    - NYS Misses 50% Power Emissions Reduction Target in 2030
- The Amendment to allow climate smart town and country road work fails
- No wide spread support for climate change action among students or any other group
- Large forest, effort to quarantine pests, ticks, poison ivy spreading, in the Region
- Fish and Wildlife Service has to Adjust the Endangered Species Act

Agriculture Impacts

- US Food Prices Spike Due to California Drought
- Warming Northern Areas Extend Growing Season
- Farmers Adopt No-Till and Bio Char for Sequestration

Economic Impacts

- Lack of Snow Lessens Interest in All Winter Sports
- Parks Resident Data Show Movement from Back Country to Hamlet to Village
- New Flood Maps, Costly Flood Insurance
- Industrial Forest in the Park Abandoned, Becomes Forest Preserve
- Coastal Storms Stagger State Budgets, Citizen's Budgets,

Floods, Droughts, Heatwaves

- The region gets hit by 3 extraordinary storms in 25 years. Droughts also have dramatic impacts on lake levels.
- Most Adirondack homes now have at least one air conditioner
- Ice Storm adaptation become more important

Managing Severe Weather

- AATV Convenes a Severe Weather Summit, a Regional Severe Emergency Response Plan is in Place
- Badly Damaged Areas Often Sell Out to FEMA, becoming county park lands
- State shifts spending focus to adaptation

Events that Would Hurt (or simply not happen)

- The State's Community Risk and Resilience Act was passed last year to require consideration of climate change in all State funded projects. Under this scenario, this would turn out to be not working as hoped.
- It also assumes town and county government ignore climate change issues.

Regional Endstate Ranking Exercises

Prior to the workshop, the participants were given the endstates and asked to read them carefully and then complete a ranking exercise. They were asked to rank order the endstates on two measures:

- Desirability: which endstate do you personally think would be most desirable if it could be made to happen? If you could only pick one, which one would you want to have happen?
- Attainability: which endstate do you personally think would be the easiest to make happen? If you had the job of implementing an endstate, which one do you think is most doable?

They had to put the endstates in a linear rank ordering from most to least on the two measures. We took these rankings and summed them across the entire group of participants. We attach a score from 0 to 100 to each endstate. If an endstate is ranked first by all participants it gets 100. If it is ranked last by all participants it gets 0. Very high or very low scores show agreement in the room. Here is the result of the "before the workshop" ranking.

	Desirability		Attainability	
1	A	85	E	75
2	C	73	B	61
3	B	52	F	48
4	D	50	A	44
5	E	35	C	42
6	F	4	D	30

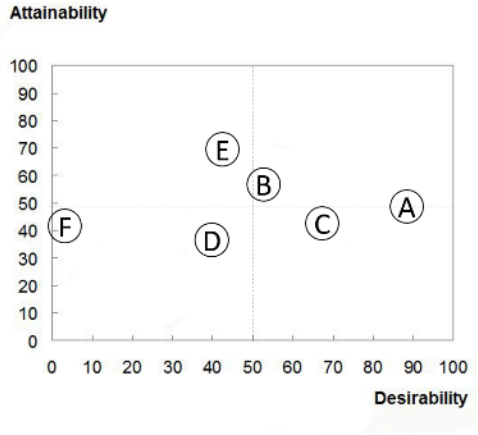
A: Minimize Our Carbon Footprint
B: Community Resilience
C: Hyper-Green Human Refuge
D: Rise Up and Demand Change
E: Pragmatic and Measured
F: Regional Tipping Point

Ranking Result Prior to Workshop

A (Minimize our Carbon Footprint) was clearly the most desirable and it was not the least attainable (as was the case in the first workshop in December 2014). The C (Hyper-Green Human Refuge) was second most desirable as it does describe a pretty nice future for the region, but it is the second to last in attainability. B (Community Resilience) was next in desirability - it doesn't really describe a nice future but maybe it is the one we have to execute on. It is considered pretty attainable. D (Rise Up and Demand Change) was next in desirability. If it gets to this, then things are not good. It was rated least attainable. E (Pragmatic and Measured) was not considered desirable as it isn't a sufficient response but it is of course very attainable because it describes what we are doing now.

After the presentation of the scenarios on day two of the workshop we again asked the participants to rank order the endstates on the same two measures. Now, however, they were ranking the endstates as interpreted and defended by the teams in the room.

	Desirability		Attainability	
1	A	90	E	72
2	C	69	B	60
3	B	53	C	47
4	E	45	A	44
5	D	41	F	41
6	F	3	D	36



A: Minimize Our Carbon Footprint
B: Community Resilience
C: Hyper-Green Human Refuge
D: Rise Up and Demand Change
E: Pragmatic and Measured
F: Regional Tipping Point

Ranking Result after Scenario Presentations

A similar pattern as before with the exception of the E scenario, which increased in desirability while the D scenario fell in desirability as we can see by this side by side comparison of the rankings. The A scenario gained a little in desirability and attainability. The F scenario fell in attainability, which is a good thing as this is a failure scenario.

Compare Before and After Ranking

	Desirability Before		Desirability After		Attainability Before		Attainability After	
1	A	85	A	90	E	75	E	72
2	C	73	C	69	B	61	B	60
3	B	52	B	53	F	48	A	47
4	D	50	E	45	A	44	C	44
5	E	36	D	41	C	42	F	41
6	F	4	F	3	D	30	D	36

For this group, A (Minimize our Carbon Footprint) is not so impossible but we also have to do B (Community Resilience).

Integrated Ratings with Context Scenarios

The following table rolls up the individual ratings by each team of how well their scenario would do under the different world response scenarios. On the last row, it also shows the rank ordering of each context scenario in terms of likelihood.

	G1: Governments in	G2: Bottom Up	G3: Private Sector	G4: Take It to Streets	G5: Oblique Path	G6: The Anthropocene
A: Minimize	++	++	+	0	0	-
B: Resilience	+	++	+	0	+	--
C: Human Refuge	+	++	0	-	+	--
D: Rise Up	--	+	-	++	++	+
E: Pragmatic	-	++	++	--	+	-
F: Tipping Point	--	0	-	-	-	++
Probability Rank ->	6	2	3	4	1	5

If you look down the columns, sum the +/- information, then you see that our scenarios in the region do best under G2 Bottom Up, which makes sense as what we are doing is an instance of that bottom up activity. It is also good that the group saw that as a likely scenario. Our region does quite well under G5 (Oblique Path), which was considered the most likely. The G3 (Private Sector) scenario is helpful to most of our scenarios, especially the E (Pragmatic and Measured).

If you look across the rows, it is the A (Minimize our Footprint) that is most favorably impacted by the world response but it does best under G1 (Governments in Gear), which was seen as very unlikely. B (Resilience) does reasonably well under the likely world scenarios G5, G2 and G3. D (Rise Up) does best if the G4 (Take it to the Streets) scenario happens.

The Common Events

Each team selected events to build their scenario from the present to their endstate. We recorded each team's event selections and a full list of events and the selections by teams is an appendix. Our database then pulled out those events that were used in 4 or more of the scenarios A through F. We call these common events. In this workshop, there were 37 events that were used in 4 or more scenarios. This is a fairly large set of events in common among the scenarios. The common events present issues and possible future actions that are clearly significant.

In the tables below, the first six columns show how a team selected the event for its scenario:

- (+) means that it helped or must happen for that scenario.
- (-) means that it hurt or must not happen for that scenario.
- If the space is blank, it means that this event was not in that team's scenario.
- The columns marked HU and HL indicate if this event was deemed Highly Unlikely (HU) or Highly Likely (HL). If neither is indicated then the event was considered uncertain.

The common events fell into seven themes: disasters, resilience, clean energy, wildlife and forest protection, agriculture, education, and rallying public opinion.

Most of the teams felt that **disasters** and other widely felt negative impacts (e.g., ticks and poison ivy) were important to rally public opinion and make the threat of climate change real. Usually the C Refuge team didn't want the weather to get bad. D (Rise Up) in particular liked them. Bad weather elsewhere in NY wasn't necessarily good for us because it takes funding to recover.

A	B	C	D	E	F	HU	HL	#	Yr	Title
-	+	-	+	-	+			6	15	Massive 20,000 Acre Fire Devastates the Region's Forest
+	-	-	+		+		Y	18	15	Ticks and Poison Ivy Now Common in the Adirondacks
+	+	-	+	-	+		Y	22	20	Third Extraordinary Flood Event in 25 Years Hits Adirondack Region
-			+	-	+			64	15	Three Consecutive 'No Snow' Winters Close Many Winter Recreation Businesses
-	-	-	+	-	+			106	20	Coastal Storms Stagger both NYS & Citizen's Budgets

Adaptation and resiliency planning and investment were a common theme. Interestingly, on these events E and B selected almost identically showing the significant overlap in the two scenarios. The case of event 100 shows the difference in the two scenarios. In the E scenario we don't see climate change as a pervasive planning issue but we do in B. Note that two-thirds of these events were deemed highly likely.

A	B	C	D	E	F	HU	HL	#	Yr	Title
+	+	+	-	+	-			56	4	Majority of Adirondack Region Towns Sign on to Climate Smart Program
+	+		+	+			Y	60	10	Regional Severe Emergency Response Plan in Place
+		+	-	+			Y	62	15	Ice Storm Adaptation Skyrockets in Importance
+	+	+		+				86	5	Adirondack Towns Win Big Climate Change Grants
+	+	+		+	-		Y	88	5	Town Board Training Now Includes Climate and Resilience as Major Topics
+	+	+		+				89	8	Many Towns Successfully Complete Map Amendments for CC Adaptations
+	+		+	+			Y	91	10	New, Highly Accurate, Flood Maps Drive New Insurance Rates
-	+		+	+	+		Y	96	20	Entire Hamlet/Village Neighborhoods Decide Not to Rebuild after Disasters
+	+	+		+				97	1	NYS Lowers Grant Thresholds from $1M to $10,000
+	+		-		-		Y	100	4	Community Risk and Resiliency Act Drives Climate Change into all State Planning
+	+	+		+	-		Y	101	10	Amendment Allows Climate Smart Road and Utility Modernization Projects
+	+	+		+			Y	103	8	DEC and DOS Fund Resiliency Planning Efforts State-Wide

Clean energy projects were also common to the scenarios. D would vote against them because they meant that people would think we were making progress but it really wasn't enough. Note that these are all highly likely.

A	B	C	D	E	F	HU	HL	#	Yr	Title
+		+	-	+			Y	29	2	Wave of Energy Efficiency Projects by Region's Municipalities
-	-	-		-	+		Y	44	5	Major Fight over Siting of Solar Array in Keene
+	+	+	-	+	-		Y	45	8	Local Solar Arrays Proliferate – Public, Private, Education

Wildlife and forest protection and adaptation were common themes as well. On habitat connectivity, Team E wasn't making that kind of investment yet. They didn't see big impacts on wildlife or phenology.

A	B	C	D	E	F	HU	HL	#	Yr	Title

+	+	+		+		Y		2	5	Most ADK Property Managers have a Climate Change Response Plan
+	+	+			+			5	10	Invasive Species Quarantine Plan Activated
+	+		+	-			Y	9	5	Habitat Connectivity Projects Receive Priority Funding
+	+	+	+					13	7	The Northern Forest Atlas is Baseline for Tracking Changes in the Region
+	+	-		-	+			15	10	ADK Researchers Find Big Ecosystem Impact from Synchronization Problems

Agriculture was an important area for adaptation, but also growth.

A	B	C	D	E	F	HU	HL	#	Yr	Title
+	+	-		-			Y	20	10	Massive Expansion of Investment in the Water Sector
+	+	+		+			Y	24	5	Cornell Extension Service Promotes Adk Agricultural Climate Change
-		-	+	-				25	8	CSA Farms See Falling Number of Customers as Risks Increase
+	+	+	-	+	+			26	10	Warming Weather Makes Farmers & Gardeners Rejoice

Education and involving students in this effort were also common events, needed for all the scenarios except F, the failure one.

A	B	C	D	E	F	HU	HL	#	Yr	Title
+		+	+	+			Y	73	4	Wild Center Receives Major Grant to Develop HS Curriculum on Climate Change
+	+	+	+	+	-			74	5	Local Students Flock to Adirondack Climate Corps
+	+	+	+	+				75	5	50% of Adk Schools, Camps and Clubs Have 'Climate Watch' Data Gathering Programs
+	+		+	+			Y	77	5	Regional Colleges & Universities Win Many Adk Climate Change Related Research Grants

Lastly, rallying **public opinion** was critical to success on the political front.

A	B	C	D	E	F	HU	HL	#	Yr	Title
+	+	+	-	+				79	3	State Welcomes Grassroots Climate Change Plan

+	+	+	-		Y	80	5	Many ADK Churches Rally for Climate Change Action
+	+	+	-	-		81	5	Widespread Local Support Organizing for Action on Climate Change Related Issues
+		+	-	-		83	10	Youth Drawn to Larger ADK Towns by Climate Activism

It's worth noting that 7 events were chosen by all 6 teams. These clearly are important and capture main themes of the workshop discussions. Disasters are part of most of these scenarios as they build public awareness and eventually support. Moving to solar was something all teams endorsed. Getting local government and students engaged were other important themes.

- 6 **Massive 20,000 Acre Fire Devastates the Region's Forest**
- 22 **Third Extraordinary Flood Event in 25 Years Hits Adirondack Region**
- 26 **Warming Weather Makes Farmers & Gardeners Rejoice**
- 45 **Local Solar Arrays Proliferate - Public, Private, Education**
- 56 **Majority of Adirondack Region Towns Sign on to Climate Smart Program**
- 74 **Local Students Flock to Adirondack Climate Corps**
- 106 **Coastal Storms Stagger both NYS & Citizen's Budgets**

Endstate Synthesis

At this point in the workshop we reshuffled the teams so there was at least one person on each new team that had worked previously on each of the endstates. The new teams were given the task of combining all of the data they now had including:

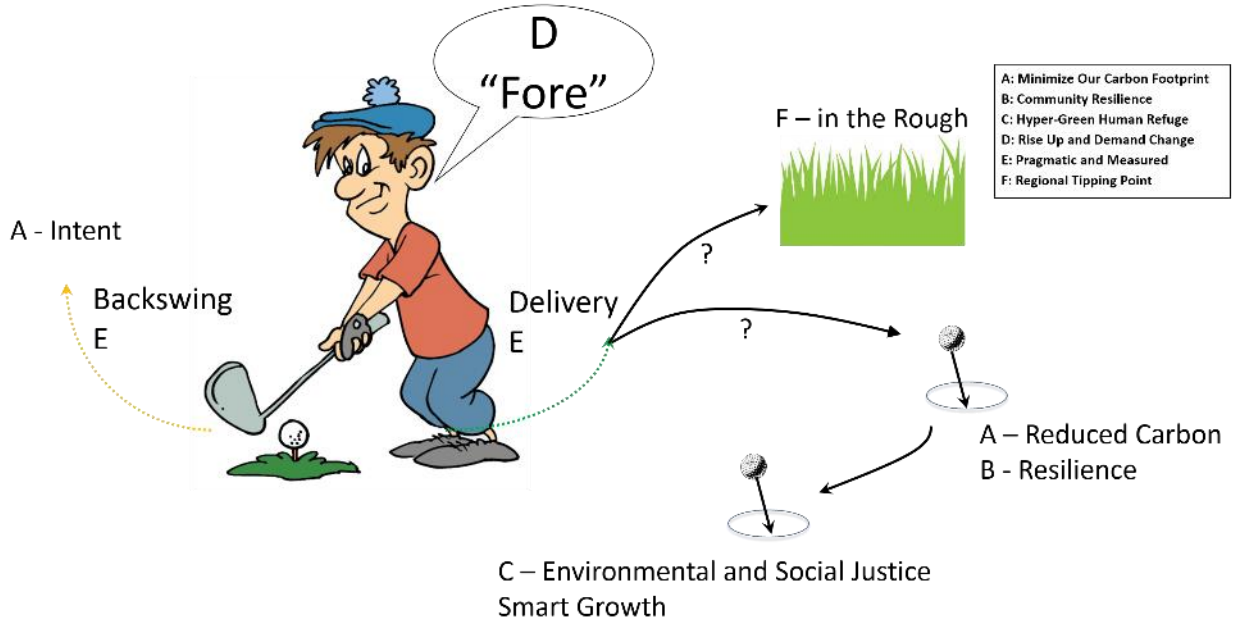
- The persuasive presentations by the teams of their scenarios and their insights about them
- The results of the rank ordering of the Adirondack region scenarios on desirability and attainability
- The results of the rank ordering of the world response context scenarios on probability
- The results of the wind tunneling exercise that tied the regional scenarios to the context scenarios
- The intersection of events in the different scenarios (common events)

Teams were asked to develop a composite scenario for the region. It could have triggers from the context scenarios. It could just combine the best features of the desirable scenarios. They were also asked to nominate a handful of events or other actions that we should take to move toward that synthesis.

Team 1 Synthesis

This team used the metaphor of a golf swing to depict the way the different scenarios combine for a successful outcome. Both the backswing and the follow through are important. In the preparation of

the backswing we emphasis minimizing our carbon footprint (A) and the pragmatic and measured steps at adaptation (E). Then we continue through with the delivery and continue to execute on E. If the ball goes astray then we end up in the rough. If it goes right we get a hole in one, reduced carbon (A) and improved resilience (B). Ultimately, you might get to the good outcome described in C where we really have accomplished smart growth and issues of social and environmental justice are addressed. Calling out about all this as in the D scenario, Rise up, here in the metaphor is yelling "Fore".



Team 1 Synthesis: The Golf Swing

This team chose the following events as the most critical:

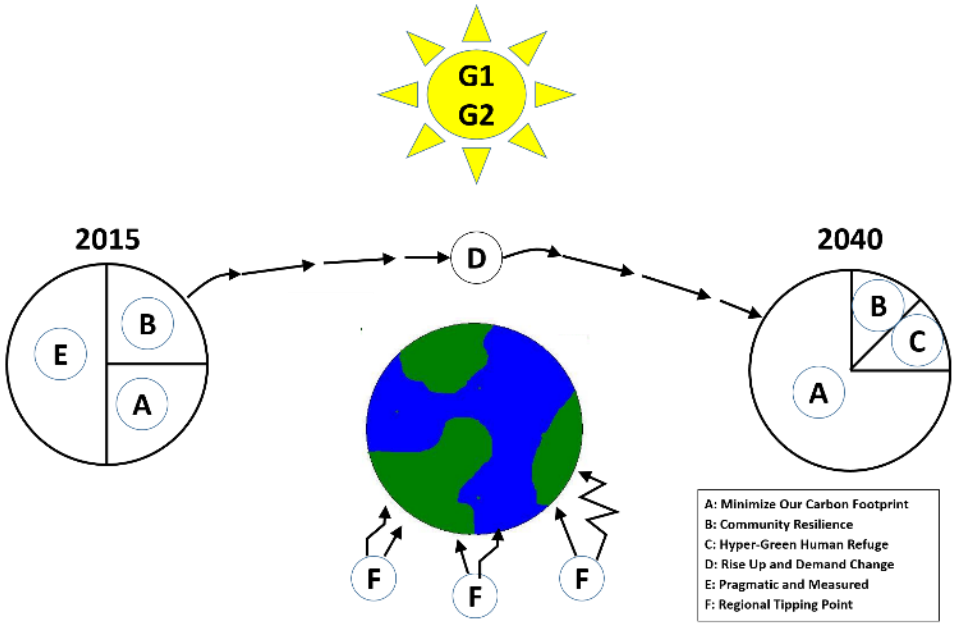
- 29 **Wave of Energy Efficiency Projects by Region's Municipalities**
- 45 **Local Solar Arrays Proliferate – Public, Private, Education**
- 60 **Regional Severe Emergency Response Plan in Place**
- 24 **Cornell Extension Promotes Adk Agricultural Climate Change Adaptation/Mitigation**
- 73 **Wild Center Receives Major Grant to Develop HS Curriculum on Climate Change**
- 75 **50% of Adk Schools, Camps and Clubs Have 'Climate Watch' Data Gathering Programs**

These are all near-term events that are relatively easy to accomplish. The main focus of their synthesis was A+B+E. It is not easy to play a good golf game and balancing out all these factors and trade-offs won't be easy either.

Team 2 Synthesis

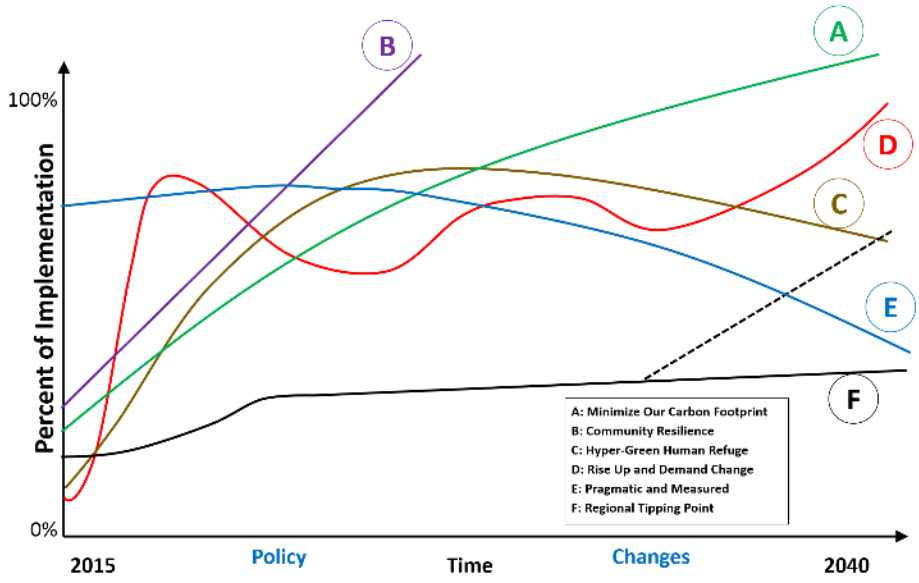
Team 2 put the earth in the middle of the diagram and depicted how the emphasis of our responses would change over this 25 year period. On the left is a pie chart of activity today, which is dominated by E with some B and A. D (Rise Up and Demand Change) is what we need to maintain momentum and to

keep us moving forward toward the goal of doing mostly A with some B and C in 2040. C here is seen as the fully sustainable life here in the Adirondacks. The G1 (government) and G2 (bottom up) world response scenarios are like the sun, they give energy and life to the efforts here in the region. Bad, unpredictable events are depicted as the F scenario causing disruption around the world and in the Adirondacks and that will spur action.



Team 2 – One Synthesis

This team produced two different synthesis diagrams. The second one tracks the different levels of implementation of the scenarios over time from today to 2040. In this vision, we get to 100% of B (Community Resilience) fairly quickly and later we get to 100% of A (Minimize Carbon). They expect to have a period where C (Human Refuge) works for us and maybe leads to some population growth, but it will taper off by the end of this period as we see more damaging impacts. D (Rise Up) fluctuates over time as we get some good leadership, but then maybe some setbacks. E is what we are mostly doing now but it declines over time as the B and A efforts ramp up. F is a reality that we see already and it will come at us at least to some degree. What we hope is that it doesn't come at us full force in the out years, which we don't really have control over.



Team 2: Second Synthesis – Implementation over Time

Team 2 chose the following critical events:

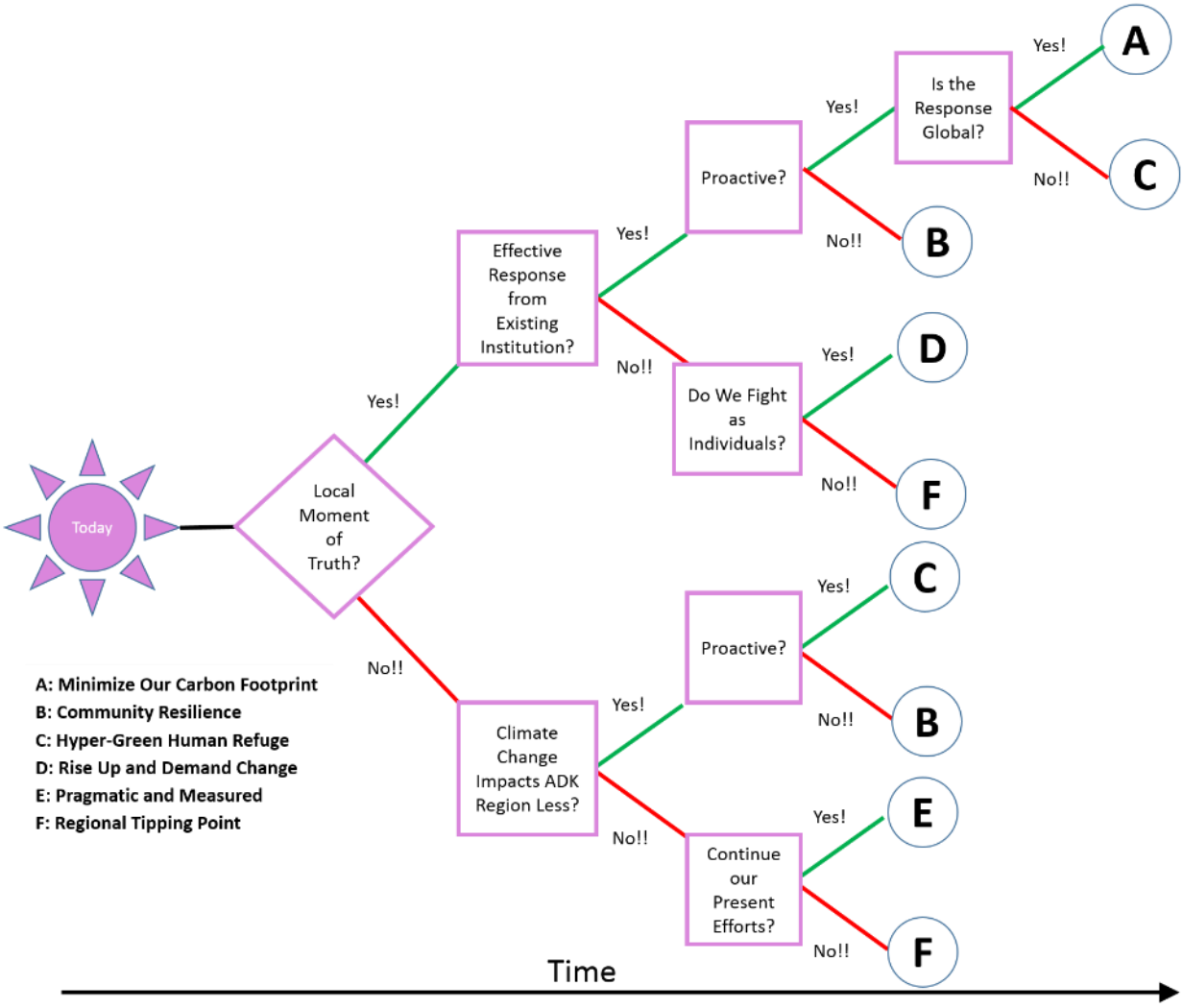
- 29 **Wave of Energy Efficiency Projects by Region's Municipalities**
- 45 **Local Solar Arrays Proliferate – Public, Private, Education**
- 60 **Regional Severe Emergency Response Plan in Place**
- 88 **Town Board Training Now Includes Climate and Resilience as Major Topics**
- 80 **Many ADK Churches Rally for Climate Change Action**
- 75 **50% of Adk Schools, Camps and Clubs Have 'Climate Watch' Data Gathering Programs**

These are very similar to the ones chosen by Team 1, involving clean energy, community resilience plans and training and getting churches and schools involved.

Team 3 Synthesis

This team developed a decision tree analysis about how we get to the different outcomes. It all starts with a local moment of truth where we galvanize the community at large. If this doesn't happen, and the impacts to the region are lower, then we can get to the C (Human Refuge) if we are proactive in preparing for it. If not, what we get is B (Community Resilience). If the impacts are large, we can at least do E (Pragmatic) or else we find ourselves in F (Anthropocene).

If we have the moment of truth, then do our institutions respond effectively? If not, then do we fight as individuals (D – Rise Up)? If not, we will find ourselves in F again. If our institutions do respond, do they respond in a really proactive manner? If not, we are at B (Community Resilience) dealing with the impacts. If yes, and the global response is sufficient, we could be in the world of A (Minimize Carbon). If the global response is not sufficient, then we might see ourselves in C as many parts of the country will be in bad shape.



Team 3 Synthesis – Decision Tree

This team chose the following critical events:

- 97 **NYS Lowers Grant Thresholds from $1M to $10,000**
- 80 **Many ADK Churches Rally for Climate Change Action**
- 29 **Wave of Energy Efficiency Projects by Region's Municipalities**
- 45 **Local Solar Arrays Proliferate – Public, Private, Education**
- 75 **50% of Adk Schools, Camps and Clubs Have 'Climate Watch' Data Gathering Programs**
- 86 **Adirondack Towns Win Big Climate Change Grants**

Lowering the grant threshold was seen as a way to empower more people and organizations. Even a little money can make a big difference in getting something going. The churches are important to rallying opinion. Instead of waiting for some disaster, continue to ring the bell across the Adirondacks that we need to act on this and prepare. In the churches, with students. We need to do the clean energy and efficiency projects and Towns need help in becoming more resilient.

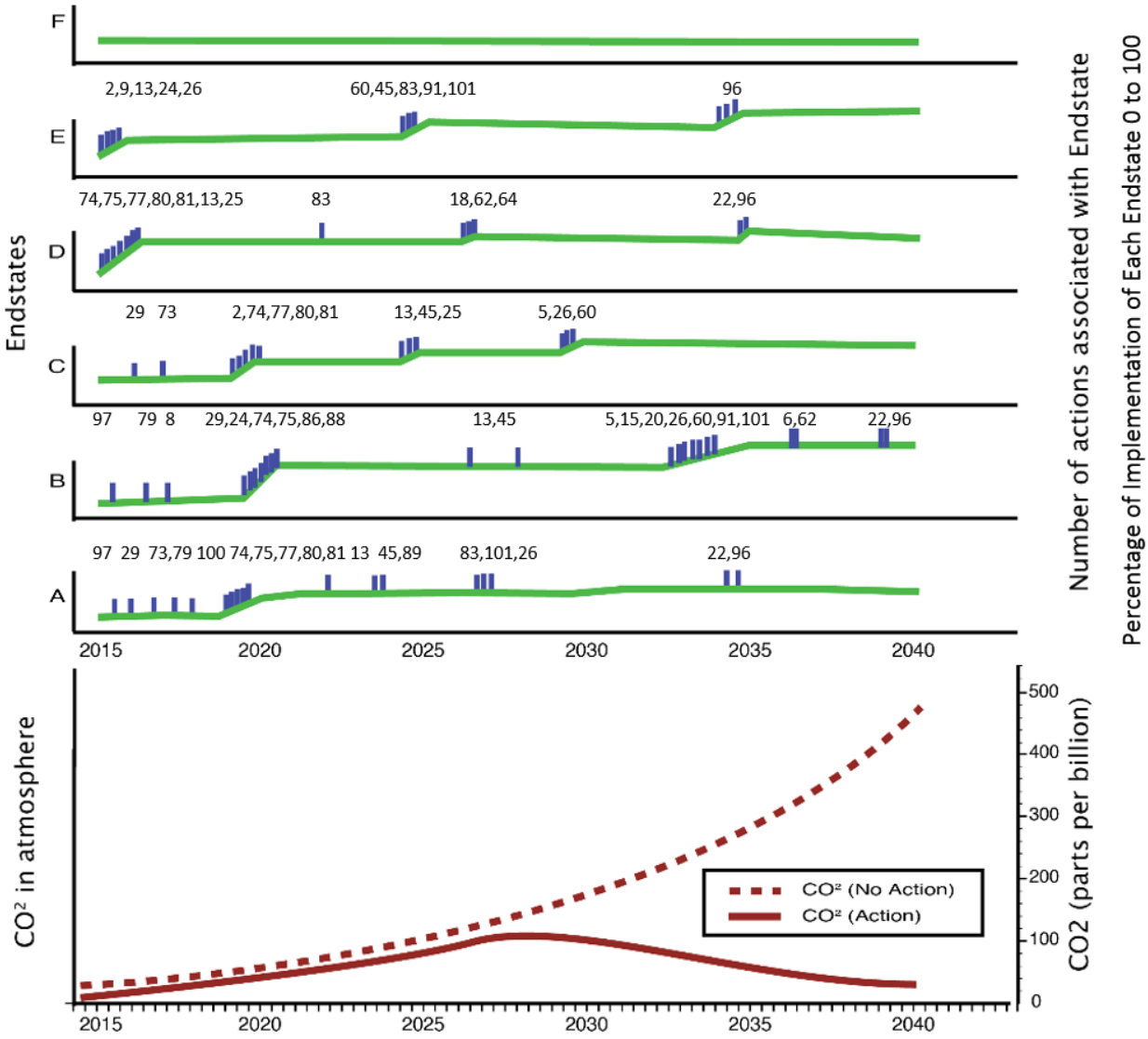
Team 4 Synthesis

This team tried to take all the data from the workshop and graph it. They have really created a Future Map! Across the top, they identify the dominant scenarios at each period of time. Each scenario is graphed below in terms of the percentage it has been implemented. Specific events happen that drive the percentage up for different scenarios. At the bottom is the graph of CO2 emissions peaking at about 1000ppm and then hopefully declining. (Note, that this graph is not really accurate for the period 2015 to 2040. It is more of a graph over the entire century. We better not get to 1000ppm by 2028!).

DE ABC CE EDB ABD

Dominant Endstate

Occurrence of action items that lead to endstates



A: Minimize Our Carbon Footprint
B: Community Resilience
C: Hyper-Green Human Refuge
D: Rise Up and Demand Change
E: Pragmatic and Measured
F: Regional Tipping Point

This team chose the following critical events:

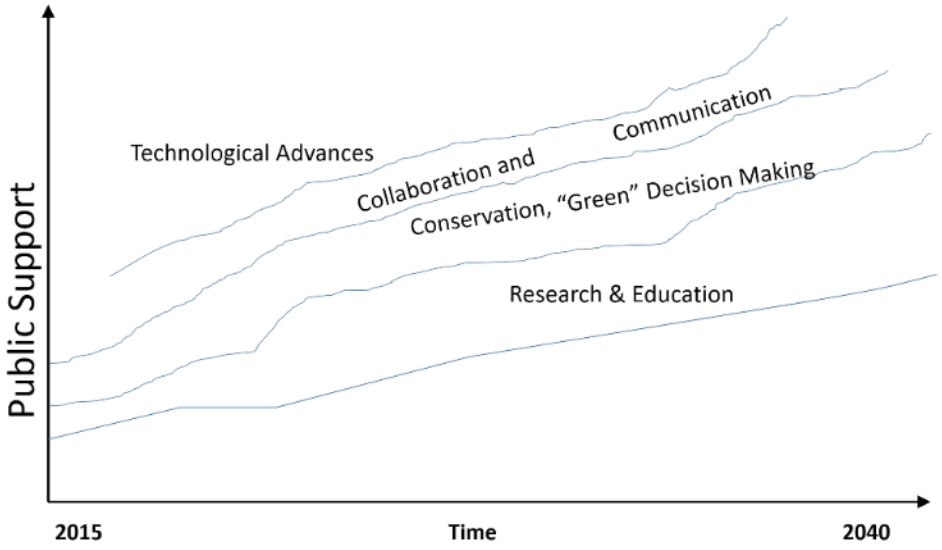
- 73 **Wild Center Receives Major Grant to Develop HS Curriculum on Climate Change**
- 80 **Many ADK Churches Rally for Climate Change Action**
- 29 **Wave of Energy Efficiency Projects by Region's Municipalities**

The team suggested that getting climate change into school curriculum as key and that it could be positioned well as an example of the common core – data based, etc. They also talked about reviving the Mayor's Climate Change Agreement and having our local supervisors get on board. Use social networks to get the word out and engage local groups like Votes for Change and the NC350.org.

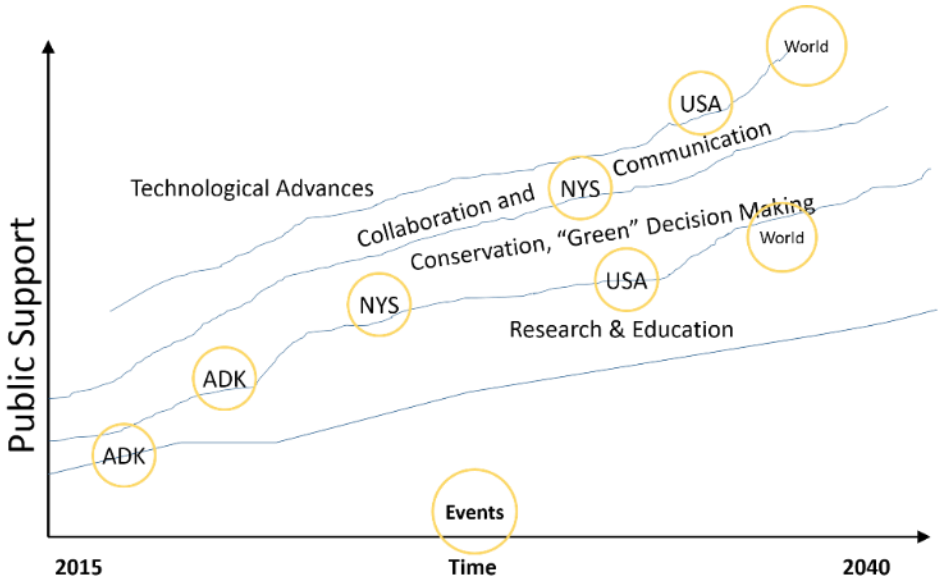
Team 5 Synthesis

This team built up a series of timelines using overlays.

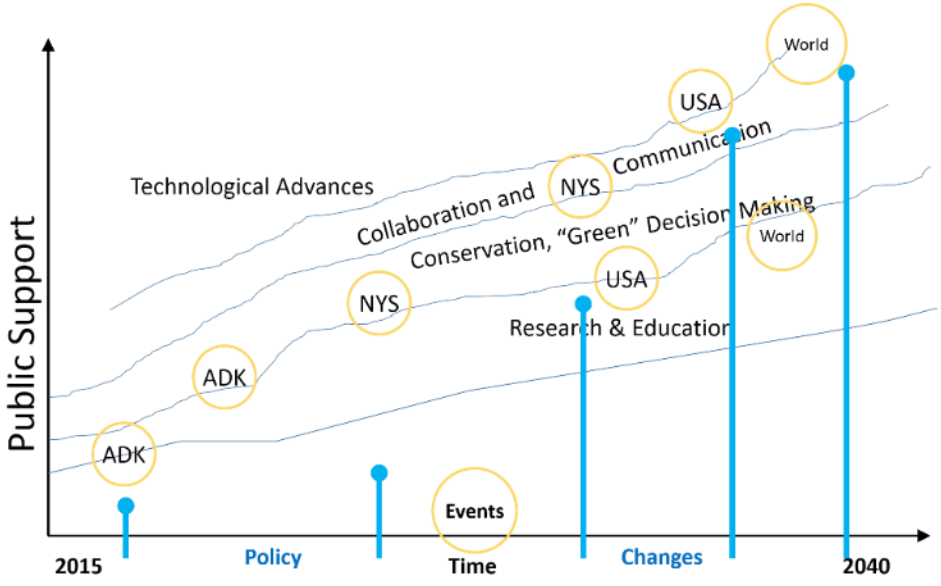
Their main message was that everything we do can help to build public support for action, which is ultimately what's needed. A variety of efforts that grow over time will do this. The foundation is research and education that must continue. Also conservation and green decision making as depicted in the C scenario. Collaboration and communication across the region is key to improving public support. After a while further technology advances can help and will also make it easier for people to do the right thing.



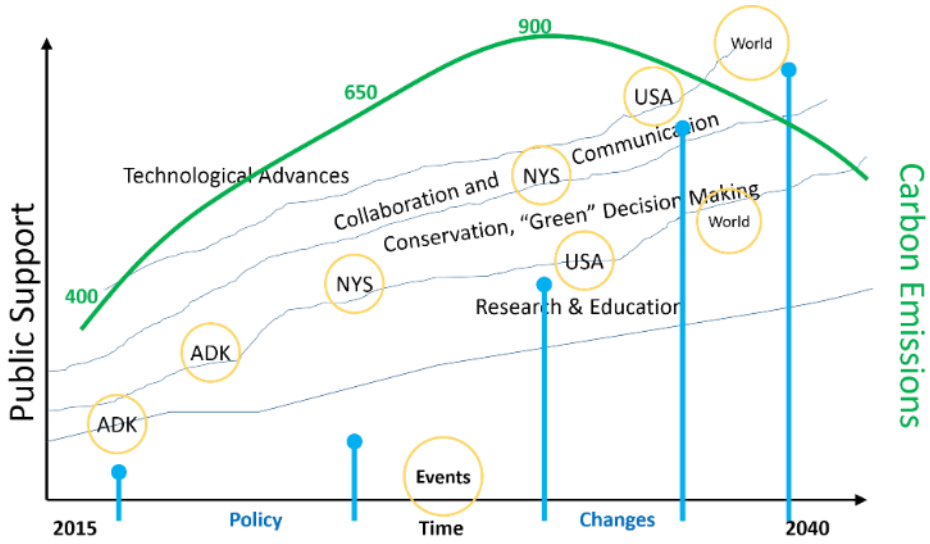
Next, they foresee a series of bad events that are unpredictable but increase over time and increase in scale. They start in the Adirondacks, then impact larger portions of New York State (NYS) and eventually are global in scale. These are going to make climate change real to people.



Next, with public support growing over time, they see a series of policy changes (blue vertical lines) take place, at first small but building to significant by the end of this period. Policy will be enacted at all levels, regional, national and global.



Lastly, they plot expected carbon dioxide concentrations in the atmosphere starting at 400ppm today and cresting at 900ppm and then going back down. (Note, this last part is really not accurate over 25 years. It is more of a graph for what is expected across the entire century. It would be shocking to reach 900ppm by 2030!).



For their critical events, this team chose:

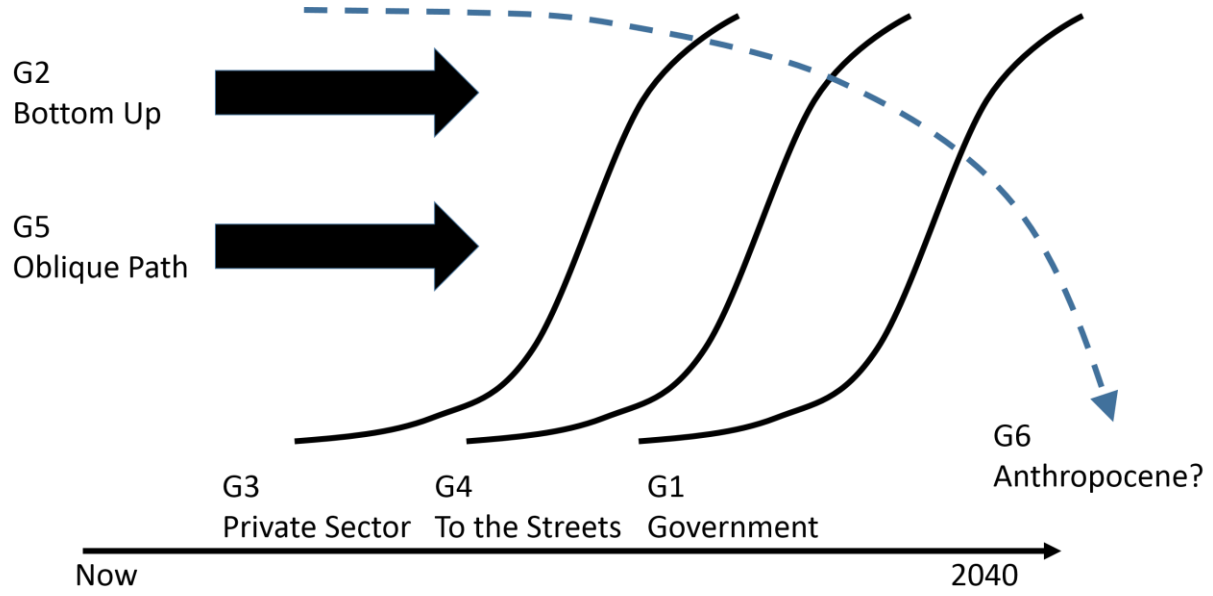
- 45 **Local Solar Arrays Proliferate – Public, Private, Education**
- 56 **Majority of Adirondack Region Towns Sign on to Climate Smart Program**
- 88 **Town Board Training Now Includes Climate and Resilience as Major Topics**
- 100 **Community Risk and Resiliency Act Drives Climate Change into all State Planning**
- 101 **Amendment Allows Climate Smart Road and Utility Modernization Projects**
- 103 **DEC and DOS Fund Resiliency Planning Efforts State-Wide**

The team warned that we could already be committed to large changes in climate due to redirection of the jet stream and possibly the Gulf Stream currents. We are already seeing changes in the jet stream that have caused these severely cold winters here during the last 2 years.

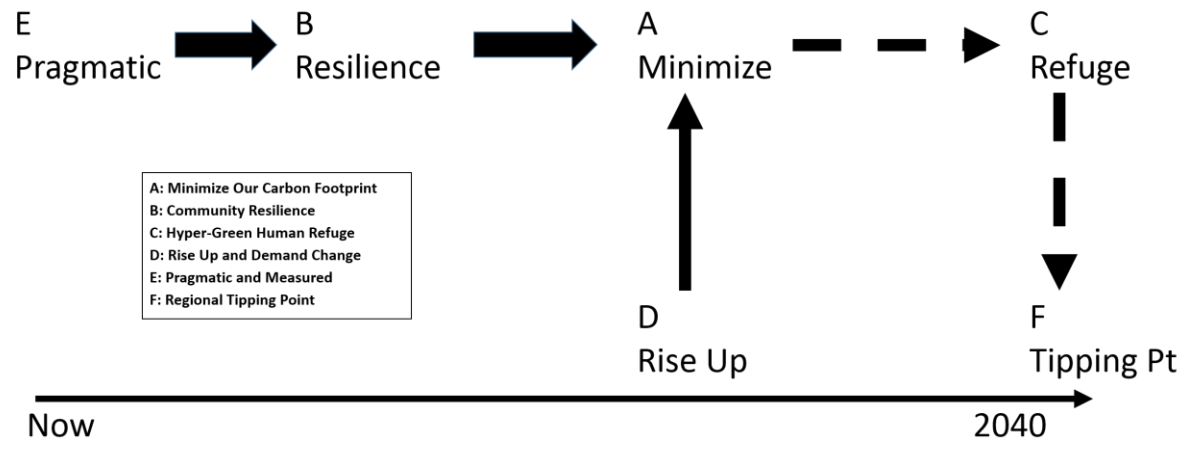
Dave Mason's Synthesis

Dave offered two diagrams. The first showed the sequencing of the world response scenarios and the second showed the sequencing of the Adirondack regional response scenarios.

The first combines the global response scenarios. Bottom Up (G2) and the Oblique Path (G5) reflect a lot of what is happening now. The Private Sector (G3) will get increasingly engaged. The public will get more engaged (G4) as extreme weather events develop everywhere. Governments get involved but late in the time frame.



Dave's second drawing shows the ADK Response scenarios only. E (pragmatic) is today's condition and B (resilience) is a more proactive version of E, preparing for storms before they happen. As extreme weather becomes more frequent, A (minimize carbon) does gain traction, especially if the D (rise up) develops to give A more energy and political support. We do get to C (human refuge) but the question Dave's raises is the stability of C. Do we get to C and stay in that position or is it just a step to F (regional tipping points)?



Dave's events

26 Boost Local Ag

45 Local Solar Everywhere

75 Half of Schools, Camps, Clubs Do Climate Data Gathering

89 APA Map Amendments for Hamlet Adaptation

These are very much in line with the events selected by other teams.

Plenary Discussion

We ended the day with a full group discussion. The sense of the room was that there was a lot of agreement about the way forward and many of the key steps to take. Many people said that they left this workshop at least a little more optimistic about the future of the region and our ability to address these serious issues.

It was noted though that there is much to do. All the storm recovery work after Hurricane Irene only tangentially took climate change into consideration, and it is still ongoing 4 years after the storm with another year or 2 of reconstruction still ahead. Nothing explicit was said about climate change in the planning and design of this rebuilding, perhaps because it was still too political. As public opinion grows in support of action against climate change, we may find that a lot of people see the problem and begin to say that we need to act, but had been afraid to wade into such a politically fraught arena in the past.

Others spoke of the need to reverse the deterioration of our communities. We can embrace a clean energy future as an economic opportunity. This has been a major theme of our region's strategy for the North Country Regional Economic Development Council (NCREDC). So we are starting at a pretty good place. There are a lot of clean energy projects underway in the region, notably in Chestertown where the workshop was held, which is leading the region in municipal solar PV. ANCA is spearheading "solarize" a regional effort to ramp up solar PV installations.

We can take pride in what we have accomplished so far and find energy to keep moving ahead. This can be like the threat of invasive species, something that the region has rallied together to fight. Quick education of government agencies, elected leaders and collaboration across organizations was key to our effective response to invasives. Similar steps are needed in our response to climate change. The Common Ground Alliance Forum is a key venue to build momentum and support. Let's use this year's session on climate change to maximum advantage. Let's create a clear and compelling vision of how we respond to climate change and build support at all levels for implementation.

We should be reaching out the region's schools to get this message to students and faculty alike. Wherever we can engage young people in the effort. Get a small group together that can spread the word and speak at important forums. Get in front of the Inter-County Legislative Committee of the Adirondacks, the Local Government Review Board, the Association of Adirondack Towns and Villages, the three Regional Economic Development Councils that cover the region, and the APA Commissioners.

Get exposure in the media like the New York Times. Spread the word that there is a vision and movement here in the Adirondacks. We can be an example to other regions.

At the end, there were some voices of pessimism, people who have been working on these issues for a long time. But there was also optimism from younger voices who see this as a challenge and a series of problems to solve. We need to link up and do something together.

There was a sense that although government isn't yet leading on these issues, there is a lot of activity at different levels and in the private sector. There are many paths to progress and we can be part of many of them.

Appendices

Full text of events

1	04	**Biomass Markets Help Improve Forest Health**	Best practice today is to harvest low grade trees, thinning, and leaving high grade trees for higher value harvesting in the future. Markets for energy biomass are not great but they cover a lot of the cost of these forest management practices, so more of it gets done. This is a big turnaround from the high-grading of forests that has long afflicted the region.
2	05	**Most ADK Property Managers have a Climate Change Response Plan**	Most land managers in the Adirondack region have a plan in place for dealing with the impacts of climate change. Help was abundant - they received assistance from the USDA Climate Hub's Northern Institute of Applied Climate Science, the Wildlife Conservation Society, and the Northern Forest Center, among others.
3	05	**Boot Washing Stations Common in the Park**	With boat washing station programs fully implemented, the DEC and area non-profits do the work to get the funding and set up stations for people entering the woods to clean their boots of dirt that may harbor a destructive invasive.
4	06	**Industrial Timberland in the Region Replanted for Energy Harvesting**	In the past, when a forest was cut, it was left to naturally regenerate. As more acreage in the region is targeted for biomass energy markets, the emerging practice is to plant species suitable for short cycle harvesting for energy. It is not the right thing for every acre of industrial forest, which is highly variable, but it is a new important market for land managers to serve and they take it seriously.
5	10	**Invasive Species Quarantine Plan Activated**	Using work on aquatic invasive species as a model, the State had a plan in place with permits and permissions necessary to quickly act to quarantine early forest infestations. It allows clear cuts of about 20 acres with all biomass removed from the site and destroyed. This plan has been activated twice when highly invasive insect infestations were found. One site was on private and the other on Forest Preserve. It was clear there would be no time to waste once an infestation was located.
6	15	**Massive 20,000 Acre Fire Devastates the Region's Forest**	After years of summer drought and a decade of tree-killing insect infestations, all it took was a lightning bolt to start an unprecedented fire in the region. The tragedy turns a large carbon store in a huge emissions source that smolders for a long time even after it is officially 'under control'. Some of it was Forest Preserve land, some industrial forest - the boundaries don't matter. Some back country homes were lost, but hamlets and villages were not harmed.
7	20	**Abandoned Industrial Forests Added to Forest Preserve**	Invasive infestations, ice storm damage, blow downs, washed out roads have led to abandonment of many industrial forests in the region. The land, often under conservation easements, has become impossible to sell. The State has ends up with many of these properties and adds them to the Forest Preserve.

8	25	**Genetically Engineered Maple Shown to be Resistant to Heat**	With sugar maples in decline, university research has developed a genetically modified variant that can flourish in temperatures up to 10°F hotter than their ancestors. Given the economic and aesthetic value of maples, this is welcome news to many.
9	05	**Habitat Connectivity Projects Receive Priority Funding**	There is increasing funding for many types of habitat connectivity and wildlife corridor projects. Protection of regional migration pathways across New England and north to Canadian lands gets popular attention. Bridges and culverts are rebuilt with fish and wildlife migration in mind, especially in the Forest Preserve. Land use planning, community education, and land acquisition are all required. "Critter cams" are widely employed to see and understand actual shifts all over the region.
10	05	**Citizen Scientists Perform Third Breeding Bird Atlas**	Department of Environmental Conservation's Breeding Bird Atlas census engages thousands of citizen volunteers to observe and report the birds they can identify. The first atlas was created between 1980 and 1985; the second was done between 2000 and 2005. Comparison between the two showed shifts in ranges due to climate change. A third study gets underway this year, to continue building the data set.
11	05	**Lake Placid Lake Owners Association Takes Steps to Keep Lake Trout Cool**	Lake Trout need cold water refuge spots as the region warms. Lake Placid is an ideal candidate. The shore owners collectively decide to plant trees along the shore and along all the streams coming into the lake such as one in full sun running across a golf course. Folks like their lake front lawns, but they put doing the right thing for climate change adaptation first, above their own interests. Researchers track which methods work best, sharing their findings with others across the North Country.
12	5	**A Review Paper in Science Indicates a Big Increase in Number of Ecosystems Experiencing Step Changes**	Across the country, there is a big increase in ecosystems that have been fundamentally changed. Alpine meadows have disappeared in many regions. Massive fires in desert grasslands at low elevations don't come back with their pre-fire species. Research is needed to help land managers determine best next steps for adapting management practices in these areas after the step change, particularly if novel ecosystems, or assembly of species, now exists there.
13	07	**The Northern Forest Atlas is Baseline for Tracking Changes in the Region**	Jerry Jenkins' ten-year project has been brought to completion and stands as a bedrock work for ongoing studies of climate change impacts in the region.
14	08	**ADK Bogs are Major Methane Emitters**	New measurements show that methane emissions from large conserved wetlands are major emitters of methane. The bogs were left out of the State's GHG inventory. Now the data is available. No one suggests any actions, but it is taken as more bad news, adding to the urgency of limiting human-caused emissions.
15	10	**ADK Researchers Find Big Ecosystem Impact from Synchronization Problems**	As the seasons change unevenly, plants and animals are shifting their lifecycles as well – unfortunately, they don't consult with each other first. Plants are blooming earlier than the pollinators arrive. Bird eggs hatch before their insect food prey is available. Ticks falling off moose in March no longer are killed by the cold. Scientists estimate that at least a quarter of all species in the

			Adirondacks area are impacted by this phenomenon (phenology mismatches) to a greater or lesser degree.
16	10	**New Hunting and Fishing Restrictions Put in Place in Adk Region**	Local sportsmen are confused by the all new regulations put in place to deal with the impact of climate change in the region. Some species, like lake trout, are in closed lakes. Other species like wild boar are open season all year. Some large forest areas were closed to establish refuge zones. Other areas were being remediated because of damage from invasives and are off limits to hunters.
17	10	**FWS Issues Directive on Interpreting ESA in the Face of Climate Change**	The Fish and Wildlife Service (FWS), as the main implementer and enforcer of the Endangered Species Act, has finally issued a major policy statement about how to apply the ESA to climate-related questions of species loss. The FWS focus will be on identifying those species at risk from climate change, determine which ones can have a reasonable expectation of sufficient future habitat to remain viable, perhaps with assisted migration or other approaches. Under the new guidelines FWS can determine that a specific species cannot be reasonably saved in its current habitat given likely future conditions.
18	15	**Ticks and Poison Ivy Now Common in the Adirondacks**	These unpleasant pests have established strong beachheads throughout the Adirondacks. Long held back by harsh winters, the milder weather of the last 15 years has enabled them to steadily encroach into the lower areas of the Park. Poison Ivy, long a feature of forest and stream edges, is now found all over.
19	05	**25% of ADK Towns have Septic Inspection Programs**	Following the success of the voluntary Fulton Chain of Lakes program, 25% of towns in the Park now offer free septic system inspections. Warming lake water combined with bad septic systems turns out to foster bad algae blooms that quickly deplete oxygen, resulting in major fish kills. This motivates many towns with lakes to adopt septic inspection regimes.
20	10	**Massive Expansion of Investment in the Water Sector**	Desalination, purification, pipelines, storage, shipping of water all see large investments globally. Fleets of water tankers and water trains are common. As an investment asset class, water is right up there with oil, timberland and other resources. Water-centric mutual funds and ETFs have been launched. Markets for water become common, helping to allocate it to highest priority needs. Although these changes were first seen in the US Southwest, people are concerned that Adirondack waters will be next to be monetized.
21	15	**Lake Levels have Dropped Substantially Threatening Dams, More to Come**	With rising temperatures come increased evaporation. Low-precipitation summers add to the problem. Overall levels have dropped, especially on lakes without dams. Lakes with dams have had to be lower to maintain flow downstream. This also has an impact on hydro facilities. Lots of boat houses and docks have been moved. There are historic records from the 1700s showing drops of as much as ten feet, so this is not unprecedented.
22	20	**Third Extraordinary Flood Event in 25 Years Hits Adirondack Region**	First came the big spring floods followed by Irene in 2011. A massive 500 year spring flood hit less than a decade later. And now the region has been pummeled by another hurricane, half again as massive as Irene.

23	4	**US Food Prices Spike**	US Food Prices Spike as a result of drought causing renewed emphasis on climate mitigation. Farming expands rapidly in the Northeast in response to cutbacks in California.
24	05	**Cornell Extension Service Promotes Adk Agricultural Climate Change Adaptation/Mitigation**	As a land-grant university, a primary mission for Cornell is to promote agricultural success in the state. It has enthusiastically taken on support of climate change adaptation – for dairy, for field crops, for vegetable crops. ADK farms were early adopters of a USDA program called COMET, which assesses greenhouse gas emissions and anaerobic digesters for dairy manure. These programs both save money and make the environment better. Farms include these activities in their marketing messages.
25	08	**CSA Farms See Falling Number of Customers as Risks Increase**	The idea of Community Supported Agriculture was that customers paid up front for a share of farm production. This worked great when farms over produced. This year, several CSAs experienced failures for a number of reasons. Some failed due to insects. Others due to water issues (flooding or droughts). The idea of the customer sharing the farmer's risk was too much for some people and CSA customer numbers have dropped off.
26	10	**Warming Weather Makes Farmers & Gardeners Rejoice**	Extended seasons and less powerful cold spells have changed plant hardiness zone maps in the region. A much wider variety of plants and fruit trees can survive the now-milder winters. Low-cost green houses are used by some, sometimes heated by waste heat from unrelated activity like anaerobic digesters, landfill methane capture, etc. The general result is better year-round local food, new crops and flowers.
27	15	**ADK Region Farms Improve Soil Health for Climate Change and for Themselves**	Improving soil quality is one of the best investments a farmer can make. Soil health Improvements are a boon to mitigation, adaptation, and profitability. Things like cover crops or no-till can improve soil productivity, increase carbon capture, and slow extreme rainfall runoff. Biochar (partially burned biomass) sequesters carbon, and removes pesticides and pollutants from the soil. ADK farms are early adopters of this beneficial trend. Local researchers tally the gains - before vs. after - to help quantify the benefits.
28	20	**Local Farmers Capture Most Runoff**	Excess rainfall in the region often comes outside the hot growing season and becomes polluting runoff. Summer rain is less frequent and more intense. Farmers respond by capturing much of the excess water in storage ponds for later use. Environmentalists are delighted, since this polluted runoff hurt local streams. Farms have dependable water for growing season hot spells.
29	02	**Wave of Energy Efficiency Projects by Region's Municipalities**	ANCA has a contract to provide three shared grant and proposal writers to assist municipalities in putting together projects for energy efficiency improvements and fuel switching. Bringing to life the region's Cleaner Greener Communities sustainability plan, a large number of new projects are getting started around the region.
30	03	**Large-Scale NYS Effort to Replace Wood Boilers and Stoves with Modern Units**	These 3-stage burning systems lower particulate emissions and increase efficiencies. The State practically bribes people to do the upgrade. After converting, they burn less wood and enjoy noticeably improved rural air quality. It is a boon for climate

			mitigation as well - black soot carried into the upper atmosphere then deposited in the Arctic increases the speed of ice melt.
31	05	**Housing Rehabilitation for Energy Efficiency Takes Off**	Everyone knows that big savings come from rehabilitating houses to be more energy efficient through wrapping, new windows and more insulation. A major push by the State has greatly expanded the use of the existing program. On-bill payments and no money down means it costs consumers little or nothing. Low income consumers are allowed to apply energy assistance payments (HEAP) to rehabilitation projects. Provisions for rentals are included as well. There has been a 25% increase in people using that program in the past 2 years.
32	05	**Large Building Complexes Install Wood-fired Co-gen Boilers**	Wood fueled co-gen facilities are now generating electricity as well as heat for large buildings, or a collection of co-located buildings. Offsetting a portion of electricity purchasing with on-site generation is now a common strategy in the region.
33	10	**Insurance Companies Offer Green Replacement Policies**	Several insurance companies are now selling property casualty policies that promise to rebuild your home with energy-saving green technology after a disaster, instead of just replacing it in a manner identical to the destroyed building.
34	10	**Easier to Change Fuels than to Get People to Change Habits**	Efforts to get people to lower their thermostat, insulate or drive less have not been particularly effective despite repeated efforts. Mitigation efforts that succeed in actual reductions are those that change from carbon-based fuels to solar, wind, or geothermal and/or use of renewably generated electricity (cars).
35	15	**Average Heating Bill Down by 40%**	Compared to 15 years ago, a typical home heating bill is 40% lower. Milder winters, fuel switching and more insulation have proven to be a strong combination.
36	20	**Most Adirondack Region Homes Have an Air Conditioner**	The heat of recent years has driven more and more regional residents to install air conditioners in their home. A recent survey suggested around 2/3 of homes have at least one room A/C unit.
37	20	**Net-Zero Housing Takes Off in the Region**	A certain segment of the population is highly motivated to live in net-zero housing. Net-zero multi-family rental properties that include heat, electricity and hot water prove to be good for developers, and popular with tenants who like stable monthly costs regardless of the weather. A variety of means are used to achieve net-zero, such as solar PV/thermal, extreme insulation, geothermal, and optimal siting. Net-zero is relatively inexpensive to achieve with multi-family units. Also, a segment of buyers are happy paying a required premium to build somewhat more expensive homes with all the latest gadgetry.
38	20	**15% of Seasonal Homes Now Occupied Year-Round**	With a more temperate climate, more people are staying here year-round and what had been seasonal dwellings are being used in all seasons. This bolsters the economy of some towns and allows for more businesses to remain open during the winter.
39	02	**Mineville Pumped Storage Project Gets Final Go Ahead**	Power storage is the bane of intermittent renewable generation like solar and wind. This project will use the old iron mines tunnels in Moriah to create a 260mw pumped storage facility. Entirely underground, it has no environmental impacts. FERC has now granted Albany Engineering Corporation the last required permit based on the 2014 application.

40	04	**Municipalities Invest in Restoring Old Hydro as a Way to Finance Necessary Maintenance**	There 18 lake dams in the region that used to provide power to their town but don't today. (Also 8 hydro on rivers.) The dams and the lakes are still there and need funds to do necessary maintenance and hardening in the face of new storm forecasts and insurance cancellations. Selling clean power locally is turning out be a way to finance these necessary investments, enabled by extensions to community net metering beyond solar arrays.
41	05	**Energy Financing and Improved Performance Boosts Renewable Power Adoption**	In line with its Clean Energy Plan, the State moved from subsidizing individual projects to 100% financing and Power Purchase Agreements. Many clean energy projects are now coming on line at a much faster pace. Solar PV price/performance also improved a lot. No cash up front with shorter payback periods made the projects very appealing to main stream customers.
42	05	**Buyer Groups Lower Cost of Energy Conversion**	Local governments and ANCA have set up buyers groups for services like solar and geothermal installations, retrofitting houses, and insulation. By guaranteeing a certain number of customers, the groups are able to negotiate discounts of 15% to 35%.
43	05	**Microgrid for Potsdam Up and Running**	Clarkson's design of a microgrid for Potsdam won in a state-wide competition. It allows the power network to stay up and running even if the connection to the larger grid is lost. It includes Clarkson, the hospital, SUNY Potsdam, and the central village. Now up and running, its operation is providing researchers with hands-on data about the ins and outs of microgrids.
44	5	**Major Fight over Siting of Solar Array in Keene**	The best place for the solar array was the closed town landfill. Perfect southern exposure and no other use for the land. But it is located due north of the Great Range and would be visible from most of the peaks. As a Class A project, it requires APA approval and that is turning into a major battle. Opponents cite defeat of a wind farm project years ago as their precedent.
45	08	**Local Solar Arrays Proliferate - Public, Private, Education**	State Community Net Metering laws allow solar arrays of 2MW or less, as long as their power is used within a 10 mile radius. There is rush to construct these arrays. Some are done by local towns, some by major utilities, some by colleges or school districts, and many by local entrepreneurs. One leader started a chain of these across the region. This allows homes and businesses with sites inappropriate for solar to tap into the power of the sun.
46	10	**New Grid Plans Emphasize Distributed Local Power Production, Electric Vehicles**	New planning for upgrades to the electric grid within the region focuses on enabling more local generation of power from all sources (hydro, solar, small scale wind, biomass co-gen). Coupled with micro-grids, they are more resilient and less dependent on the old grid, which is increasingly used mostly as backup and as a place to send excess power. Complementary smart-grid technology interacts with intelligent power using systems such as electric vehicle charging stations to load level and insure grid stability.
47	04	**Uber & Lyft Come to the Hinterlands**	Mobile-phone based ride sharing services like Uber and Lyft have somewhat retooled their models, and now serve users in rural, sparsely populated areas with long distances between destinations. They now offer trip posting as well as ride requests. Not only does it cut down on the cost of transportation, it is a welcome source of

			additional income for those offering the rides, often on trips they already had planned to take.
48	08	**Commuting Mileage Drops Significantly in the Region**	Shared employer vans, telework, state employee mandates on tele-meetings and carpooling have combined to significantly lower the mileage driven by cars in the region.
49	8	**Inter-Hamlet Bike Paths Well Used for Commuting**	More and more people are biking to work a good portion of the year using newly improved inter-hamlet bike paths.
50	10	**Public & Private Charging Stations Plentiful in the Adirondack Region**	Electric vehicles are more popular all the time and the Adirondack region has made it easy to operate one here. There are almost a 1000 charging station scattered throughout the region. Smartphone apps let drivers easily find the nearest charging station. Employers have placed charging stations in their parking lots for employees, who can charge them during the day, accounting for a large portion of the increase. Area schools and shopping areas were also early adopters.
51	10	**Growing Interest in Hydrogen Vehicles in Some US Markets**	Hydrogen fuel cell vehicles were first sold in the US in 2015. These cars are more appropriate for cold weather areas of the country, compared to electric cars. Their range per tankful is similar to regular cars and they take no time to fill up, unlike the long time it takes to charge batteries. Hyundai, Toyota and Honda all have cars in the market. Though still not common, their sales are ramping up at a decent pace.
52	10	**Cellulosic Biofuel Production Scaling Up**	Sweetwater in Rochester NY has been successful in using various cellulosic biomass feedstocks to make biofuels and bioplastics at reasonable cost and scale. Unlike ethanol, it is not corn-based and doesn't cause spikes in food prices or use more valuable farm land. The most common feedstock is wood but it also uses switchgrass and agricultural waste.
53	15	**Average Electric Car Range Exceeds 250 Miles**	There has been significant improvements in battery technology over the past 15 years. Also, standards for battery swapping are in place so that you can quickly get in and out of a charging station (similar to how one changes out your gas grill's propane tank). Overall, the applicability of these vehicles is almost the same as gas powered ones and they are ideal for daily commutes to sites with charging stations in parking areas.
54	20	**Autonomous Electric Vehicles Implement Regional Public Transport System**	A system of small self-driving vehicles pick up people based on requests made through smart phones and take them to their destination using the most efficient routes to accommodate 2 or 3 passengers. The region sees a significant drop in miles driven in personal fossil fuel powered cars.
55	20	**Fed-Ex and UPS Delivery Trucks Converting to Hydrogen in Region**	The technology of choice for zero emission large vehicles is the hydrogen fuel cell, which scales up easily compared to battery power. The delivery services have been leaders in converting their fleets to this technology as they can set up their own fueling stations. We see them all the time in the region.
56	04	**Majority of Adirondack Region Towns Sign on to Climate Smart Program**	NYS created the "Climate Smart Communities" program to provide local governments with a framework to guide their climate actions. As awareness of climate change has grown, more than half the towns are putting together local climate action plans, which target lowering of emissions and adaptation. A key strategy is to lower

			energy use and switch to cheaper renewables like solar to reduce municipal costs. These plans improve chances for winning grants.
57	04	**AATV Convenes Extreme Weather Summit**	At the request of members, Adirondack Association of Towns and Villages has convened a meeting on best approaches and pilot project funding sources for dealing with extreme rain events, droughts, invasive species, extraordinary heat waves, resilience and the like. By partnering with their peers and learning from pilots, they really hope their communities can get out in front, like they have on invasives. Besides, it is a jobs boosting opportunity all across the region.
58	04	**Detailed Sub-Region-Specific Climate Models have Higher Accuracy**	A report from the National Research Council concludes that geographically limited models are able to capture more processes that matter in that environment than the traditional global models. For example, the ability to capture the effect that dust has on the melting of snowpack and the expected levels of dust in that region due to human activity. Other processes that drive precipitation are also often more localized in nature and need to be modeled on a sub-region specific basis to be accurate.
59	05	**Contract Let to Design a Regional Public-Private Mobile Communications Infrastructure**	We want the fewest, best-site towers for comprehensive communications in the region, both for cell phones but also public communication needs like emergency services. A major goal is design of redundancy and hardening against major storm and weather event like ice storms.
60	10	**Regional Severe Emergency Response Plan in Place**	After many disasters, a concerted effort has been made to develop a regional emergency response system that is designed for extremely severe and widespread disasters such as big ice storms or super violent thunder storms. Temporary housing, two weeks of food stocks, emergency communications equipment, a volunteer network, and a regional integrated response plan are all in place.
61	10	**Green Infrastructure Flood Plain Reclamation Widely Implemented in Region**	Advanced techniques for improving flood resilience focus on keeping rain where it falls, removing bottlenecks (e.g., bridges that are too narrow or low), expanding use of flood plains upstream, etc. This is as opposed to building higher retaining walls and trying to box the streams in. These techniques preserve the integrity of the environment while protecting important human assets. They create new habitat and at times new farmland.
62	15	**Ice Storm Adaptation Skyrockets in Importance**	The region is now regularly experiencing several major ice storms every winter – closing roads, taking down power lines, devastating trees, shuttering businesses. Locals are scrambling to take corrective actions by reinforcing communications, relying more on local power, moving to micro-grids, trimming trees, working from home, and improving emergency services. People who want to live here have to be willing to make these investments and live with the inconvenience.
63	08	**Campaign to Lower the Thermostat Working in Hospitality**	Like the adoption of not washing sheets and towels every day, the campaign to get guests to set thermometers to 67 in the winter and 74 is gaining traction.
64	15	**Three Consecutive 'No Snow' Winters Close Many Winter Recreation Businesses**	Three winters in a row with very low snowfall have forced many winter recreation businesses to close. Winter visitors used to account for 1/3 of annual tourism revenue, but that has dropped by

			half. The activities worst hit are snowmobiling and cross country skiing. Ski areas w/o snowmaking close or open only occasionally, often staffed by volunteers. It isn't just lack of snow but declining popularity of winter sports generally.
65	15	**ADK Golf Courses Boom from Extended Playing Season**	It is now possible to play golf eight months per year. Delighted golfers are now hitting the links from April through November.
66	20	**Refrigerated Winter Recreation Venues Continue to Do Well**	The tourism industry has made the investments necessary to keep the Adirondacks an attractive winter sports destination. Ski jumps, luge/bobsled, skating, and hockey all use artificial cooling to maintain their winter sport venue even as warmer temperatures are the norm. Downhill and some cross-country trails are maintained with snow making gear. Only snowmobiling and ice fishing fade. The new systems use low emission or clean energy sources.
67	05	**Community Colleges Offer 'Low Carbon Footprint' Job Training**	Burgeoning opportunities in solar installation, weatherization, energy conservation, biomass fuels, community net metering power operations, local agriculture/food development, and the like have resulted lots of opportunities for skilled workers. In response, new courses are being offered in these skill areas at regional community colleges. There is a rising need to train young people who want to help transition the region to a lower carbon footprint model - they need skills to do this.
68	07	**Plattsburgh is a Clean Power Site, Attracts Certain Industries**	A legacy of the 1950s New York Power Authority allocations and the old AF Base is a major power transmission line giving direct access to the hydro power in Messina. Businesses looking for highly reliable, copious clean energy (e.g., big datacenters), or to improve their carbon footprint, now see Plattsburgh in a different light.
69	08	**Resilience Zones Set Up to Attract Businesses**	Comprehensive planning for resilience in certain areas in the region has created zones with resilient communications, power, emergency health services, water, and food supplies. In the planning for these zones, the goal is a holistic approach to responding to catastrophes. The expectation is that these specially prepared zones will attract certain businesses that need high levels of availability and can never go down. More than just 'backup' zones, they attract primary fail safe operations.
70	10	**Ecosystem Adaptation and Remediation Service Firms Growing Fast in Adirondacks**	The ADK region is home to half a dozen world-class firms focused on environment adaptation and remediation services. These are primarily homegrown firms, built on first-hand experience. Clients from around the world call on their expertise. They continue to grow.
71	15	**Biomass Energy Is a Good Source of New Jobs in the Park**	The biomass push extends beyond the Park. New pellet-fueled heating systems and fuel supply contracts are marketed to places as far as Albany, Watertown and Utica. Wood pellet heating systems are becoming a mainstream alternative, especially for larger buildings. All kinds of jobs are generated from wood harvesting to distribution to installation of systems and operation of larger scale plants in schools, prisons, etc. within the Park region.
72	02	**State Funds Support for Public School Sustainability & Emergency Sheltering**	A NYS program provides funding and technical assistance to all public schools to create and implement sustainability and resilience plans. Energy conservation, fuel switching, waste management,

			local food purchasing, backup power and emergency communications, etc. are all part of the effort. Funding goes to BOCES, which oversees this effort. Many of schools are also identified as emergency shelters when disasters hit and are eligible for special funds.
73	04	**Wild Center Receives Major Grant to Develop HS Curriculum on Climate Change**	The Wild Center is the education hub in the region for climate change science, impacts and implications. A key focus of their efforts has always been high school students. Now they have received major funding to work with regional schools and BOCES to develop new course materials on the subject to be used throughout regional high schools. It is hoped that it can be a model for the rest of the country.
74	05	**Local Students Flock to Adirondack Climate Corps**	Students from local high schools and colleges establish a regional a "Climate Corps". They assist researchers, help winterization efforts, staff educational projects promoting resilience and more. For example, teams of students staff popular trail heads and boat launches to teach tourists about the impacts of climate change they will see, what new plants to be careful of, how to avoid bringing invasives into the region, etc. Tourists pay attention to these informed young people who are so aware of what is happening.
75	05	**50% of Adk Schools, Camps and Clubs Have 'Climate Watch' Data Gathering Programs**	Schools, community groups, summer camps and clubs are the basis of broad participation in the collection of a wide variety of climate data in different areas of the Park. Because they are active in different seasons, when organized they can collect very broad and deep data.
76	05	**Majority of Regional Colleges Divest from Fossil Fuel Investments**	More than half of all regional colleges have an explicit policy to disallow investments in fossil fuel companies for their endowment.
77	05	**Regional Colleges & Universities Win Many Adk Climate Change Related Research Grants**	Their focus on environmental and power issues, and being located in an environmentally rich region, have made regional institutions a logical place to study the impact of climate change and adaptation techniques. They are receiving many climate change adaptation and mitigation related grants and new programs are being set up all the time.
78	18	**Virtually All Regional Colleges are Carbon Neutral**	Local colleges have led the way to sustainable energy use; they have become carbon neutral by using a wide variety of approaches. Most of them offer some sort of environmental degree, so it was an excellent case study for students to participate in.
79	03	**State Welcomes Grassroots Climate Change Plan**	Modeled after the Adirondack Common Ground Alliance, a new grassroots movement brings diverse organizations and interested parties together to design a climate change agenda. It looks across all dimensions – environment, communities, water, infrastructure, communications, etc. – and creates an region-wide set of research, mitigation and adaptation priorities. It took shape at an annual Forum and grew into a regional high priority agenda for government, NGOs, regulators, schools, everyone. The Governor's Office is highly supportive.
80	05	**Many ADK Churches Rally for Climate Change Action**	Seeing climate change as a desecration of God's work, several dozen churches in the region are rallying their congregations to take action on climate change – in their daily activities, in their

			community interactions, and with their elected officials. Climate change activism becomes a way for the churches of the region to share information, goals and a working agenda, something they've never shared before.
81	05	**Widespread Local Support Organizing for Action on Climate Change Related Issues**	There is a consensus in the region that we must act, and act soon. Not everyone calls it climate change - but everyone sees that things are changing in unprecedented ways. Tourists, hunters, farmers, tourism firms, town managers all talk with their peers and agree that something is up and that action must be taken. Organizations like the Wild Center and Mother's Out Front have educated and mobilized family members.
82	10	**CC Now Polls in Top 4 of Americans' Priorities**	For the first time, climate change is an issue that makes it into the top 4 concerns of Americans. 75% believe it is a major issue. In comparison, in 2014 48% of Americans thought climate change was a major issue, though not a high priority one-- it was ranked 19th out of 20 in terms of importance. The change is attributed to increasing weather anomalies, continuing education, greater influence of millennials, and retirement of some of the "old guard".
83	10	**Youth Drawn to Larger ADK Towns by Climate Activism**	Millennials see climate change as the central rallying issue of their time. They spread the word through social networks to friends & family. The steady drain of young people out of the park has been partially offset by in-migration of youth who are drawn to participate in the climate action here -- lots of green jobs, a sustainable lifestyle, and like-minded people. They settle in larger towns, where things are lively, schools are better and their can live with a lighter carbon footprint, rather than in the smaller towns. Enjoying the buzz, local youth are now somewhat less likely to leave the Park.
84	10	**Investment Funds without Fossil Fuel stocks are Very Popular**	These new funds that specifically give investors of all sizes the ability to eliminate fossil fuel companies from their portfolios.
85	12	**Climate Change Deniers Face Social Ostracism**	Social mores can change rapidly. Using a racial or homophobic slur is unthinkable and unacceptable in most areas of civic discourse. Climate change denial has been added to this list. Even conservative talk shows have dropped the topic.
86	05	**Adirondack Towns Win Big Climate Change Grants**	The region has received tens of millions of dollars in state grants over the last few years, for projects related to climate change adaptation, mitigation and clean energy. As with the economic development grants won in earlier years, the key was having a clear idea of what was needed and coordinating across government and NGOs, coupled with leaders to create the proposals and manage implementation. Cash-strapped towns welcome the bonanza.
87	05	**Property Values in Hamlets Have Caught up with Remote Property**	People used to prefer living on larger properties outside of town but that has now reversed. Now people prefer living in the hamlets where there are walkable services, good internet and more reliable utilities. Remote homes, even vacation properties, far away from useful stores and common services, are proving harder to sell than ever before. As hamlet/village property values increase, owners spend more on improvements and neighborhoods get nicer.

88	5	**Town Board Training Now Includes Climate and Resilience as Major Topics**	The State-Wide Association of Towns and Villages as well as AATV now provide training for town board members in climate change facts and strategies for increasing resilience.
89	08	**Many Towns Successfully Complete Map Amendments for CC Adaptations & Migrant Influx**	Removing hamlet designation from flood plains and adding more appropriate, buildable hamlet land is in accordance with smart growth principles. If people are to move away from flood plains, they need someplace nearby to move to. The new hamlet is contiguous with existing hamlet, just higher and safer. This change also helps accommodate people who are (1) arriving in the region from other hard hits areas and (2) want to move from the back country into the hamlets and villages where it is easier to handle the changes.
90	8	**Adk Town Sued for Negligence in Climate Change Adaptation**	Some Adirondack businesses have sued a town for negligence in not doing planning for the increased vulnerabilities associated with climate change. The lawsuit claims the town should have followed state resilience guidelines in upgrading its bridges, culverts, and flood plain guidance. The data was there but they didn't act on it.
91	10	**New, Highly Accurate, Flood Maps Drive New Insurance Rates**	NYS completed high resolution Lidar mapping of the region and used the data to build new 3D models of the region. These can now be used to accurately assess flood vulnerabilities across entire watersheds in great detail and under different rainfall scenarios. Rates for flood insurance are tied to the risk of flood calculated from these updated maps. Much higher flood insurance costs begin to persuade people to leave homes in vulnerable areas.
92	10	**Most ADK Towns Have Single Stream Recycling**	Residents put all their recyclables into a single bin, unsorted. It gets sorted - mostly automatically - at a regional facility. With this ease of use, many more towns offer full recycling, and residents in those towns are much more likely to use it. The amount of trash dumped in landfills goes down, reducing the cost and carbon footprint of the regional waste stream.
93	15	**Study Finds High Levels of Intra-park Migration to Larger Towns**	A recent study has found that park residents are indeed migrating from the back country and small hamlets into larger regional centers. They like the better amenities, the increased reliability of communication and power services, and the decreased driving costs.
94	15	**Adirondack Generation Z Getting Elected to Town Boards**	Fed up by the lack of action on things they feel are important, Generation Z residents (the generation after millennials) have been campaigning and winning local and regional offices. This is the generation that grew up attending the Youth Climate Summits and they are intent on making a difference. They are starting to shift the conversations to topics that are most important to them, like shared transportation options, climate change adaptation, and reducing regulation on small-scale food producers.
95	20	**Private Land Use Plan Updated to Accommodate Large Influx of Coastal Migrants**	Downstate residents are desperate to escape the summer heat, as are the wealthy inhabitants of stifling southern states. The State's shore dwellers are seeking higher ground. Intense pressure on regulators has resulted in opening up the Adirondacks to more intensive development on private lands adjacent to existing hamlets and villages. These areas have long sought sustainable

			growth and see this as their opportunity to grow their population, improve services and enhance school populations.
96	20	**Entire Hamlet/Village Neighborhoods Decide Not to Rebuild after Disasters**	Whole sections hamlets and villages that get hit hard by floods or horrific ice storms decide to take FEMA buyout offers rather than rebuild, like a portion of Upper Jay did after Irene. These homes are in a confirmed flood plain, or the road/utility infrastructure would be too expensive to rebuild, or it remains vulnerable in some other way. Many of these residents are moving to more resilient areas nearby. The ruined buildings are torn down and the areas memorialized with roadside plaques explaining what happened.
97	01	**NYS Lowers Grant Thresholds from $1M to $10,000**	Plenty of worthy small town climate change related projects only need ten thousand dollars or so, not more than a million. The State figures out how to handle, or bundle and manage, larger numbers of small projects.
98	02	**FEMA Changes Rules in Response to Climate Change**	FEMA rules used to require that any infrastructure they funded for replacement was of the same type and quality of what it was replacing. They now acknowledge that much of the infrastructure needs to be upgraded to handle the increased severity of storms (e.g. culverts), and will pay for the increased cost. The idea is to stop replacing the same culverts and bridges over and over, for example.
99	02	**NYS Comptroller Extends Payback Period for Energy Efficiency Projects**	Energy efficiency improvement projects have the longest paybacks and have been difficult to implement by municipalities that must adhere to the Comptroller's guidelines. This is especially problematic when fossil fuel prices drop.
100	04	**Community Risk and Resiliency Act Succeeds at Driving Climate Change into all State Planning**	The Act passed in 2014 turned out to be a key step in getting climate change considerations into planning and program decision making at all levels of State government. All departments actually do now include climate change in their planning process. It is also a requirement for those receiving state funds for projects. It seems like a small thing but changing the system like this was a big deal.
101	10	**Amendment Allows Climate Smart Road and Utility Modernization Projects**	The amendment supports community needs like water wells, buried power lines and broadband, inter-village bike paths, water treatment plants, larger bridges and culverts, storm water management, habitat connectivity and the like. Formerly, each of these small things required a lengthy and costly constitutional amendment process if they involved Forest Preserve lands, so they often simply didn't get done.
102	04	**RGGI Cap and Trade Turns to New Sectors & New Regions; Increasing Energy Funding**	The Regional Greenhouse Gas Initiative started with work on reductions emitted from power generation facilities. By 2014, for example, New York had reduced GHG from power plants by 40% since 2005. Now expansion focuses on sectors like transportation and buildings; coordinating with more states. The big win is that the increased revenues will flow into NYSERDA, providing more funding for energy research and financing of many renewable projects.
103	8	**DEC and DOS Fund Resiliency Planning Efforts State-Wide**	A joint effort of DEC and Department of State (DOS) focuses on developing comprehensive resiliency plans for towns and villages throughout the State. Those in flood plains get priority treatment.
104	10	**NYS Deferred Compensation Plan Divests of Fossil Fuel**	This major retirement fund for State employees is the latest to take a stance against fossil fuels.

105	15	**NYS Hits Target of 50% Reduction in Emissions in Power Generation Emissions**	The NYS energy strategy worked. The NYS Energy Plan of 2014 set a target of reducing emissions from power production by 50% by 2030, compared to the 2005 baseline. NYS is on track to reach an 80% reduction by 2050. A key element was the shift from subsidies to financing clean energy adoption, which scales better. Other states are copying the NYS approach.
106	20	**Coastal Storms Stagger both NYS & Citizen's Budgets**	Two major hurricanes and a horrific ice storm have caused tens of billions of dollars of damage to New York in the last several years. Struggling to recover from these disasters, just about every non-essential program has been cut from other parts of the budget, to pay for the damage and to rebuild with resiliency in mind. It is not just government money, big increases in homeowner spending are going toward restoring and protecting their homes.
107	20	**State Shifts Spending Focus to Adaptation**	NYS has spent lots of money on successful mitigation projects much of which is now sustainable. For example, solar PV is going strong using Power Purchase Agreement financing, so subsidies ended as had been hoped. The big money is now going to adaptation projects. A lot of it is incremental spending for smarter infrastructure replacement but there are some big projects too, dealing with sea level rise, flood protection and the like.

Current Expectations Voting

This list provides the results of voting the first morning on current expectations. HU% is the percentage of votes that were highly unlikely. UN% is the percentage of votes that were uncertain. HL% is the percentage of votes that were highly likely. Cer%(certainty percentage) is HL% minus HU%. Prev Cer% is the certainty percentage from all previous voting in any workshop to date.

HU%	UN%	HL%	Cer%	HU	HL	#	Yr	Title
29	11	61	32			1	4	Biomass Markets Help Improve Forest Health
89	7	4	-85	Y		2	5	Most ADK Property Managers have a Climate Change Response Plan
39	25	36	-3			3	5	Boot Washing Stations Common in the Park
50	7	43	-7			4	6	Industrial Timberland in the Region Replanted for Energy Harvesting
11	25	64	53			5	10	Invasive Species Quarantine Plan Activated
61	18	21	-40			6	15	Massive 20,000 Acre Fire Devastates the Region's Forest
32	29	39	7			7	20	Abandoned Industrial Forests Added to Forest Preserve
32	18	50	18			8	25	Genetically Engineered Maple Shown to be Resistant to Heat
11	18	71	60		Y	9	5	Habitat Connectivity Projects Receive Priority Funding
	7	93	93		Y	10	5	Citizen Scientists Perform Third Breeding Bird Atlas
50	25	25	-25			11	5	Lake Placid Lake Owners Association Takes Steps to Keep Lake Trout Cool
4	21	75	71		Y	12	5	A Review Paper in Science Indicates a Big Increase in Number of Ecosystems Experiencing Step Changes
18	11	71	53			13	7	The Northern Forest Atlas is Baseline for Tracking Changes in the Region
14	18	68	54			14	8	ADK Bogs are Major Methane Emitters
18	11	71	53			15	10	ADK Researchers Find Big Ecosystem Impact from Synchronization Problems
36	11	54	18			16	10	New Hunting and Fishing Restrictions Put in Place in Adk Region
25	4	71	46			17	10	FWS Issues Directive on Interpreting ESA in the Face of Climate Change
		100	100		Y	18	15	Ticks and Poison Ivy Now Common in the Adirondacks
4	43	54	50			19	5	25% of ADK Towns have Septic Inspection Programs
7	11	82	75		Y	20	10	Massive Expansion of Investment in the Water Sector
64	29	7	-57			21	15	Lake Levels have Dropped Substantially Threatening Dams, More to Come
		100	100		Y	22	20	Third Extraordinary Flood Event in 25 Years Hits Adirondack Region
7		93	86		Y	23	4	US Food Prices Spike
11	14	75	64		Y	24	5	Cornell Extension Service Promotes Adk Agricultural Climate Change Adaptation/Mitigation

68	18	14	-54		25	8	CSA Farms See Falling Number of Customers as Risks Increase
21	21	57	36		26	10	Warming Weather Makes Farmers & Gardeners Rejoice
4	18	79	75	Y	27	15	ADK Region Farms Improve Soil Health for Climate Change and for Themselves
18	11	71	53		28	20	Local Farmers Capture Most Runoff
	4	96	96	Y	29	2	Wave of Energy Efficiency Projects by Region's Municipalities
36	36	29	-7		30	3	Large-Scale NYS Effort to Replace Wood Boilers and Stoves with Modern Units
4	29	68	64	Y	31	5	Housing Rehabilitation for Energy Efficiency Takes Off
21	39	39	18		32	5	Large Building Complexes Install Wood-fired Co-gen Boilers
18	18	64	46		33	10	Insurance Companies Offer Green Replacement Policies
	14	86	86	Y	34	10	Easier to Change Fuels than to Get People to Change Habits
45	21	34	-11		35	15	Average Heating Bill Down by 40%
21	10	69	48		36	20	Most Adirondack Region Homes Have an Air Conditioner
17	28	55	38		37	20	Net-Zero Housing Takes Off in the Region
3	3	93	90	Y	38	20	15% of Seasonal Homes Now Occupied Year-Round
3	24	72	69	Y	39	2	Mineville Pumped Storage Project Gets Final Go Ahead
41	31	28	-13		40	4	Municipalities Invest in Restoring Old Hydro as a Way to Finance Necessary Maintenance
	21	79	79	Y	41	5	Energy Financing and Improved Performance Boosts Renewable Power Adoption
7	14	79	72	Y	42	5	Buyer Groups Lower Cost of Energy Conversion
		100	100	Y	43	5	Microgrid for Potsdam Up and Running
3	10	86	83	Y	44	5	Major Fight over Siting of Solar Array in Keene
7	10	83	76	Y	45	8	Local Solar Arrays Proliferate - Public, Private, Education
3	17	79	76	Y	46	10	New Grid Plans Emphasize Distributed Local Power Production, Electric Vehicles
17	10	72	55		47	4	Uber & Lyft Come to the Hinterlands
21	31	48	27		48	8	Commuting Mileage Drops Significantly in the Region
50	18	32	-18		49	8	Inter-Hamlet Bike Paths Well Used for Commuting
11	21	68	57		50	10	Public & Private Charging Stations Plentiful in the Adirondack Region
14	11	75	61	Y	51	10	Growing Interest in Hydrogen Vehicles in Some US Markets
14	18	68	54		52	10	Cellulosic Biofuel Production Scaling Up
		100	100	Y	53	15	Average Electric Car Range Exceeds 250 Miles
45	24	31	-14		54	20	Autonomous Electric Vehicles Implement Regional Public Transport System
7	17	76	69	Y	55	20	Fed-Ex and UPS Delivery Trucks Converting to Hydrogen in Region

31	24	45	14			56	4	Majority of Adirondack Region Towns Sign on to Climate Smart Program
	14	86	86		Y	57	4	AATV Convenes Extreme Weather Summit
3	28	69	66		Y	58	4	Detailed Sub-Region-Specific Climate Models have Higher Accuracy
14	17	69	55			59	5	Contract Let to Design a Regional Public-Private Mobile Communications Infrastructure
3		97	94		Y	60	10	Regional Severe Emergency Response Plan in Place
7	38	55	48			61	10	Green Infrastructure Flood Plain Reclamation Widely Implemented in Region
	10	90	90		Y	62	15	Ice Storm Adaptation Skyrockets in Importance
21	21	59	38			63	8	Campaign to Lower the Thermostat Working in Hospitality
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21	24	55	34			70	10	Ecosystem Adaptation and Remediation Service Firms Growing Fast in Adirondacks
14	10	76	62		Y	71	15	Biomass Energy Is a Good Source of New Jobs in the Park
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31	28	41	10			74	5	Local Students Flock to Adirondack Climate Corps
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10	17	72	62		Y	77	5	Regional Colleges & Universities Win Many Adk Climate Change Related Research Grants
10	24	66	56			78	18	Virtually All Regional Colleges are Carbon Neutral
7	48	45	38			79	3	State Welcomes Grassroots Climate Change Plan
17	3	79	62		Y	80	5	Many ADK Churches Rally for Climate Change Action
10	41	48	38			81	5	Widespread Local Support Organizing for Action on Climate Change Related Issues
10	17	72	62		Y	82	10	CC Now Polls in Top 4 of Americans' Priorities
41	31	28	-13			83	10	Youth Drawn to Larger ADK Towns by Climate Activism
14	21	66	52			84	10	Investment Funds without Fossil Fuel stocks are Very Popular

3	24	72	69	Y	85	12	Climate Change Deniers Face Social Ostracism
10	41	48	38		86	5	Adirondack Towns Win Big Climate Change Grants
41	34	24	-17		87	5	Property Values in Hamlets Have Caught up with Remote Property
7	10	83	76	Y	88	5	Town Board Training Now Includes Climate and Resilience as Major Topics
31	34	34	3		89	8	Many Towns Successfully Complete Map Amendments for CC Adaptations & Migrant Influx
17	7	76	59		90	8	Adk Town Sued for Negligence in Climate Change Adaptation
	17	83	83	Y	91	10	New, Highly Accurate, Flood Maps Drive New Insurance Rates
10	7	83	73	Y	92	10	Most ADK Towns Have Single Stream Recycling
38	24	38	0		93	15	Study Finds High Levels of Intra-park Migration to Larger Towns
24	10	66	42		94	15	Adirondack Generation Z Getting Elected to Town Boards
24	28	48	24		95	20	Private Land Use Plan Updated to Accommodate Large Influx of Coastal Migrants
3	21	76	73	Y	96	20	Entire Hamlet/Village Neighborhoods Decide Not to Rebuild after Disasters
38	38	24	-14		97	1	NYS Lowers Grant Thresholds from $1M to $10,000
28	34	38	10		98	2	FEMA Changes Rules in Response to Climate Change
3	38	59	56		99	2	NYS Comptroller Extends Payback Period for Energy Efficiency Projects
	28	72	72	Y	100	4	Community Risk and Resiliency Act Succeeds at Driving Climate Change into all State Planning
	24	76	76	Y	101	10	Amendment Allows Climate Smart Road and Utility Modernization Projects
21	38	41	20		102	4	RGGI Cap and Trade Turns to New Sectors & New Regions; Increasing Energy Funding
		100	100	Y	103	8	DEC and DOS Fund Resiliency Planning Efforts State-Wide
17	24	59	42		104	10	NYS Deferred Compensation Plan Divests of Fossil Fuel
3	21	76	73	Y	105	15	NYS Hits Target of 50% Reduction in Emissions in Power Generation Emissions
10	41	48	38		106	20	Coastal Storms Stagger both NYS & Citizen's Budgets
	3	97	97	Y	107	20	State Shifts Spending Focus to Adaptation

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Organizations Concerned with Climate Change in our Region

Alliance for Climate Education Alliance for Climate Education, or ACE, is the national leader in high school climate science education.[1]ACE is a 501(c)3 nonprofit that provides free multimedia assemblies on climate science and solutions to high schools.[2] Since 2009, ACE has reached more than 700,000 students at more than 1,200 high schools nationwide.[3] http://www.acespace.org/

Center for Business & Environment at Yale School for Forestry The Yale Center for Business and the Environment tackles one of the central management challenges of the twenty-first century: our transition to a sustainable economy. http://cbey.yale.edu/

Climate Change Response Framework The Framework is a collaborative, cross-boundary approach among scientists, managers, and landowners to incorporate climate change considerations into natural resource management. It provides an integrated set of tools, partnerships, and actions to support climate-informed conservation and forest management. http://www.forestadaptation.org/

Climate Smart Communities Climate Smart Communities (CSC) is a partnership between the State and local communities to lower greenhouse gases and save taxpayer dollars – including Smart Growth and energy-efficient land use. CSC has developed a certification process for municipalities, beyond simply adopting the CSC Pledge. As a next step, certified communities should receive some form of favorable review and/or bonus points in related State funding programs. http://www.dec.ny.gov/energy/50845.html

Cornell Climate Change Program The climatechange.cornell.edu website provides a comprehensive, interdisciplinary gateway to climate change events, initiatives, research, student courses and organizations, and public engagement at Cornell University. http://climatechange.cornell.edu/

Cornell Institute for Climate Change and Agriculture The Cornell Institute for Climate Change and Agriculture (CICCA) is focused on supporting farmers of New York and beyond with decision tools for strategic adaptation to climate change, so that they are better able to cope with potential negative effects of climate change, and are better able to take advantage of any opportunities that it might bring. http://climateinstitute.cals.cornell.edu/

DEC Climate Change Group The New York State Office of Climate Change was created to lead the development, in concert with other DEC programs and New York State agencies, of programs and policies that mitigate greenhouse gas (GHG) emissions and help New York communities and individuals adapt when changes in our climate cannot be avoided. http://www.dec.ny.gov/about/43166.html

Environmental Advocates of New York Environmental Advocates of New York's mission is to protect our air, land, water, and wildlife and the health of all New Yorkers. Based in Albany, we monitor state government, evaluate proposed laws, and champion policies and practices that will ensure the responsible stewardship of our shared environment. We work to support and strengthen the efforts of New York's environmental community and to make our state a national leader. http://www.eany.org/

Kairos Earth Kairos Earth seeks to renew a widespread understanding of the natural world as a bearer of the sacred and to restore this awareness as a foundation of both religious practice and practical action to conserve the Earth. http://kairosearth.org/

North Atlantic Landscape Conservation Coop The North Atlantic Landscape Conservation Cooperative provides a partnership in which the private, state, tribal and federal conservation community works together to address increasing land use pressures and widespread resource threats and uncertainties amplified by a rapidly changing climate. The partners and partnerships in the cooperative address these regional threats and uncertainties by agreeing on common goals for land, water, fish, wildlife, plant and cultural resources and jointly developing the scientific information and tools needed to prioritize and guide more effective conservation actions by partners toward those goals. http://northatlanticlcc.org/

Northeast USGS Climate Science Center We, the Northeast Climate Consortium, provide scientific information, tools, and techniques that managers and other parties interested in land, water, wildlife and cultural resources can use to anticipate, monitor, and adapt to climate change in the Northeast region. https://necsc.umass.edu/

Northern Institute of Applied Climate Science The Northern Institute of Applied Climate Science develops synthesis products, fosters communication, and pursues science in the following focus areas: climate change, carbon science and management, bioenergy http://www.nrs.fs.fed.us/niacs/

NYSERDA - NYS Energy Research and Development Authority NYSERDA, a public benefit corporation, offers objective information and analysis, innovative programs, technical expertise, and funding to help New Yorkers increase energy efficiency, save money, use renewable energy, and reduce reliance on fossil fuels. http://www.nyserda.ny.gov/

RGGI (Regional Greenhouse Gas Initiative) The Regional Greenhouse Gas Initiative (RGGI) is the first market-based regulatory program in the United States to reduce greenhouse gas emissions. RGGI is a cooperative effort among the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont to cap and reduce CO2 emissions from the power sector www.rggi.org

Sunvest To achieve American energy independence through market driven environmental stewardship http://www.sunvest.com/

USDA Northeast Climate Hub USDA's regional hubs will deliver information to farmers, ranchers and forest landowners to help them adapt to climate change and weather variability. The Hubs will build capacity within USDA to provide information and guidance on technologies and risk management practices at regional and local scales. http://www.usda.gov/oce/climate_change/regional_hubs.htm

The Wild Center This regional natural history museum has been a leader in bringing people together around climate change issues. Most famous for the Youth Climate Summit. https://www.wildcenter.org/

Yale Project on Climate Change Communications Conducts research on public climate knowledge, risk perceptions, decision-making and behavior; Designs and tests new strategies to engage the public in climate science and solutions. Empowers educators and communicators with the knowledge and tools to actively engage their audiences http://environment.yale.edu/climate-communication/

Selected Online Resources - Regional

ClimAid - Climate Change in New York State – 2014 Update http://www.nyserda.ny.gov/climaid

Resource Guide to Federal Climate Adaptation Programs for State Fish & Wildlife Agencies
http://www.fishwildlife.org/files/ResourceGuide_Federal-Climate-Adaptation-Programs.pdf

Historical Patterns and Effects of Changes in Adirondack Climates since the Early 20th Century Author: J. Curt Stager, Stacy McNulty, Colin Beier, and Jeff Chiarenzelli http://www.ajes.org/v15n2/stager2009.php

National Climate Assessment, Chapter 16 – Northeast US
http://s3.amazonaws.com/nca2014/low/NCA3_Full_Report_16_Northeast_LowRes.pdf?download=1

North Country Regional Sustainability Plan http://www.adirondack.org/f/docs/green/Final-Report-6-14-13.pdf

Forest Carbon Accounting Considerations in US Bioenergy Policy
http://www.ingentaconnect.com/content/saf/jof/2014/00000112/00000006/art00007

Reforming The Energy Vision: NYS Department of Public Service Staff Report and Proposal
http://energystorage.org/system/files/resources/nypsc_rev_4_24_14.pdf

Forest Adaptation Resources: Climate Change Tools and Approaches for Land Managers Edited by Chris Swanston and Maria Janowiak, USDA Forest Service, 2012 http://www.nrs.fs.fed.us/pubs/gtr/gtr_nrs87.pdf

The Wild Center https://www.wildcenter.org/

Selected Online Resources - Global

The big one: The East Coast's USD 100 billion hurricane event
http://media.swissre.com/documents/the_big_one_us_hurricane.pdf

The New Climate Economy Report http://newclimateeconomy.report/

Use of internal carbon price by companies as incentive and strategic planning tool
https://www.cdp.net/CDPResults/companies-carbon-pricing-2013.pdf

The Hartwell Paper calls for a reorientation of climate policy after the perceived failure in 2009 of the UNFCCC climate conference in Copenhagen. http://eprints.lse.ac.uk/27939/1/HartwellPaper_English_version.pdf

Global Warming's "Six Americas": An Audience Segmentation Anthony Leiserowitz, PhD. Yale Project on Climate Change http://www.c2es.org/docUploads/SixAmericas.pdf

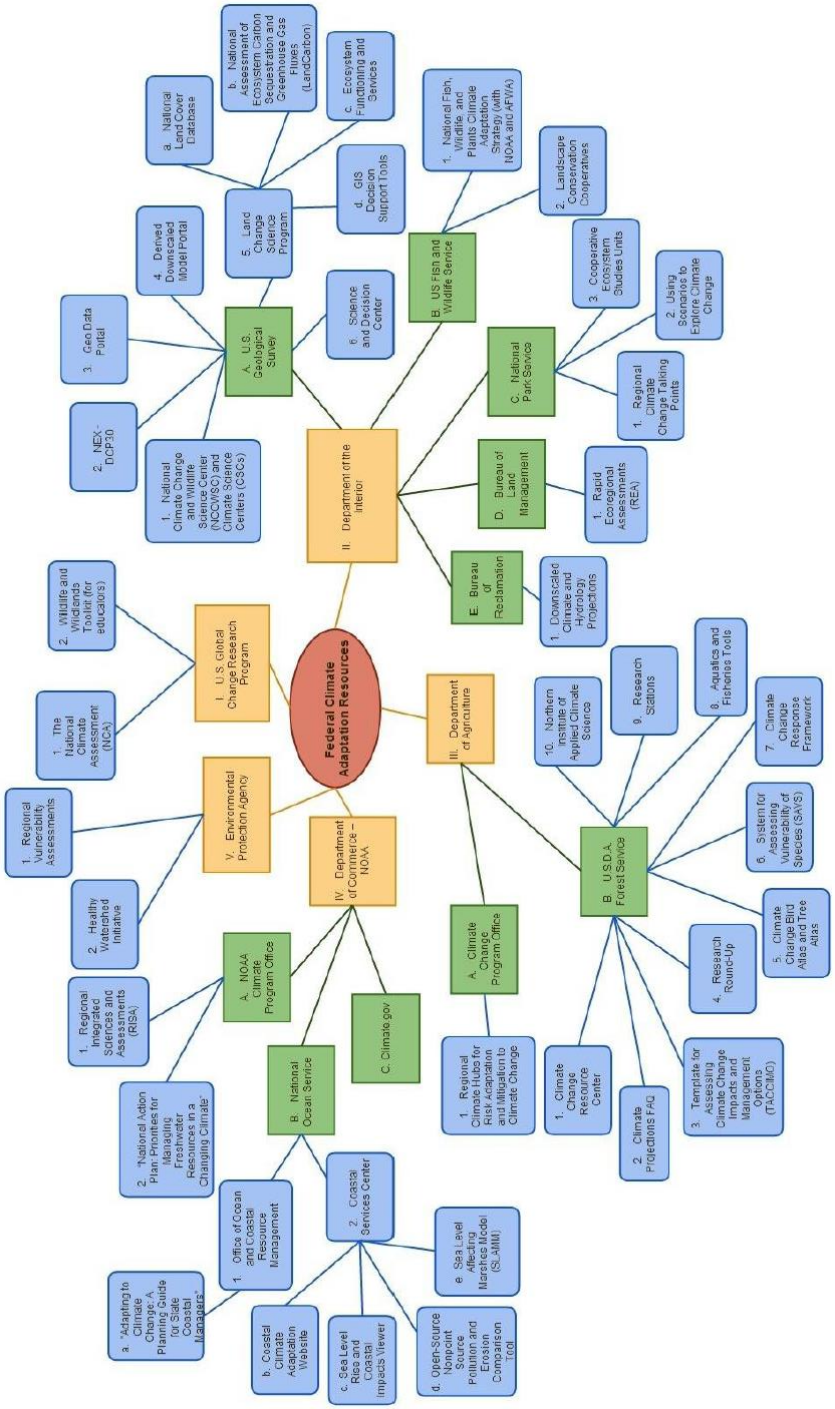
Insurer Climate Risk Disclosure Survey: Report & Scorecard: 2014 Findings & Recommendations
http://www.ceres.org/resources/reports/insurer-climate-risk-disclosure-survey-report-scorecard-2014-findings-recommendations

NASA | A Year in the Life of Earth's CO2 (video) https://www.youtube.com/watch?v=x1SgmFa0r04

Guide to Climate Smart Conservation http://www.nwf.org/What-We-Do/Energy-and-Climate/Climate-Smart-Conservation/Guide-to-Climate-Smart-Conservation.aspx

Shell Energy Scenarios to 2050
http://www.shell.com/content/dam/shell/static/public/downloads/brochures/corporate-pkg/scenarios/shell-energy-scenarios2050.pdf

An Overview of CMIP5 (climate modeling) http://climatemodeling.science.energy.gov/publications/overview-cmip5-and-experiment-design



Federal Climate Change Adaptation Programs