

# APPENDIX A: SITE SELECTION DATA

REGION	RANK	SOCIAL & ECONOMIC FACTORS			CLIMATE AND ENVIRONMENTAL CONCERNS							HEALTH DISPARITIES		CLIMATE CHANGE ADAPTATION, PLANNING & PROGRAMS				
State	Weighted Composite Score	% Non-Whites	% Limited English Proficiency Population	% Below Federal Poverty	No. of Heat Related Deaths 2010	Median Exposure to Industrial Air Toxins 2006	No. of Major Hurricanes* 1851-2009	Significant Floods** of 20 <sup>th</sup> Century		No. of Wildfires 2010	No. of Drought Impacts July 2011	Difference in Minority Share of Risk from Air Toxins & Share of Population	Difference in Low Income Share of Risk from Air Toxins & Share of Population	Do Not Have Strategic Climate Change Plan	Do Not Have a Climate Change Commission	No Climate Funding from ASTHO or NACCHO (FY 09)	No CDC Environmental Public Health Tracking Program Grant (FY 09)	No Inter Agency Coordination for Public Health
Texas	3.4	55%	14%	17%	16	50-100	19	X		6691	143	5-10%	0-1%	X	X		X	X
Arizona	3.3	42%	11%	15%	31	10-50		X		1517	5	10-15%	2.5-5%			X	X	X
New Mexico	2.8	60%	12%	18%		<10				953	23	10-15%	2.5-5%		X	X		X
Louisiana	2.6	40%	3%	18%		>200	20	X		2166	20	10-15%	1-2.5%	X	X	X		X
California	2.5	60%	20%	13%	42	10-50		X		6502		10-15%	2.5-5%					
Alabama	2.5	33%	2%	17%	14	100-200	6			2357	2	10-15%	2.5-5%	X	X	X	X	X
Florida	2.5	42%	10%	13%	10	10-50	37			2334	10	0-5%	1-2.5%					X
Georgia	2.5	44%	5%	15%		50-100	3	X		3489	4	5-10%	1-2.5%	X	X	X	X	X
Mississippi	2.5	42%	1%	21%		10-50	9	X		1696		<0%	1-2.5%	X	X	X	X	X
New York	2.4	42%	13%	14%		10-50	5			151		<0%	1-2.5%		X	X		X
Tennessee	2.3	24%	2%	16%	10	>200				1653	2	>15%	2.5-5%	X	X	X	X	X
Oklahoma	2.3	31%	3%	16%		50-100		X		1568	29	5-10%	2.5-5%	X	X	X	X	X
South Carolina	2.3	36%	2%	16%	16	50-100	6			1617		10-15%	2.5-5%			X		X
North Carolina	2.2	35%	4%	15%	13	50-100	13			3665	8	5-10%	1-2.5%			X	X	X
Illinois	2.2	36%	9%	12%		100-200				95	2	10-15%	>5%				X	X
New Jersey	2.2	41%	11%	9%		10-50	0			2011		5-10%	1-2.5%	X	X	X		X
Rhode Island	2.1	24%	9%	12%		10-50	4	X		30		5-10%	2.5-5%		X	X	X	X
Missouri	2.1	19%	2%	14%	24	50-100				1314	7	10-15%	2.5-5%		X	X		X
Hawaii	2.0	77%	13%	9%		50-100				9		0-5%	<0%			X	X	X
Ohio	1.9	19%	2%	14%		>200		X		557	3	5-10%	2.5-5%	X	X	X	X	X
Arkansas	1.9	26%	2%	18%		10-50		X		2010	9	10-15%	>5%			X	X	X
Massachusetts	1.9	24%	8%	10%		10-50	3	X		2014		0-5%	2.5-5%			X		X
Nevada	1.8	46%	11%	11%		10-50				431		<0%	0-1%			X	X	X
District of Columbia	1.8	65%	7%	18%		-				-		-	-	X	X	X	X	X
Delaware	1.8	35%	4%	11%		50-100	0			12		10-15%	2.5-5%		X	X	X	X
Indiana	1.8	19%	3%	13%		>200				57	2	5-10%	2.5-5%	X	X	X	X	X
Kentucky	1.7	14%	2%	17%		>200				1677		>15%	1-2.5%		X	X	X	X

REGION	RANK	SOCIAL & ECONOMIC FACTORS			CLIMATE AND ENVIRONMENTAL CONCERNS							HEALTH DISPARITIES		CLIMATE CHANGE ADAPTATION, PLANNING & PROGRAMS				
State	Weighted Composite Score	% Non-Whites	% Limited English Proficiency Population	% Below Federal Poverty	No. of Heat Related Deaths 2010	Median Exposure to Industrial Air Toxins 2006	No. of Major Hurricanes* 1851-2009	Significant Floods** of 20 <sup>th</sup> Century	No. of Wildfires 2010	No. of Drought Impacts July 2011	Difference in Minority Share of Risk from Air Toxins & Share of Population	Difference in Low Income Share of Risk from Air Toxins & Share of Population	Do Not Have Strategic Climate Change Plan	Do Not Have a Climate Change Commission	No Climate Funding from ASTHO or NACCHO (FY 09)	No CDC Environmental Public Health Tracking Program Grant (FY 09)	No Inter Agency Coordination for Public Health	
West Virginia	1.7	7%	1%	18%		50-100		X	617		0-5%	0-1%	X	X	X	X	X	
Idaho	1.6	16%	4%	14%		<10		X	977		0-5%	<0%	X	X	X	X	X	
South Dakota	1.6	15%	2%	14%		<10		X	732	2	<0%	<0%	X	X	X	X	X	
Colorado	1.5	30%	7%	12%		10-50		X	1076	26	>15%	>5%		X	X		X	
Kansas	1.5	22%	4%	12%		50-100		X	35	45	10-15%	2.5-5%	X		X		X	
Oregon	1.5	22%	6%	14%		100-200		X	1299		5-10%	2.5-5%			X		X	
Virginia	1.5	35%	5%	10%		50-100	1	X	847	1	5-10%	>5%			X	X		
Montana	1.3	12%	2%	15%		<10		X	1035	1	<0%	1-2.5%			X	X	X	
Wyoming	1.2	14%	2%	10%		<10			530		0-5%	2.5-5%	X	X	X	X	X	
Alaska	1.2	36%	5%	10%		<10		X	688		<0%	<0%			X	X	X	
Nebraska	1.2	18%	4%	12%		50-100			24		5-10%	1-2.5%	X	X	X	X	X	
North Dakota	1.2	11%	2%	12%		<10		X	448		<0%	0-1%	X	X	X	X	X	
Michigan	1.2	23%	3%	15%		50-100			459		5-10%	2.5-5%				X	X	
Wisconsin	1.1	17%	3%	11%		50-100			1278		10-15%	2.5-5%			X		X	
Maine	1.0	6%	2%	13%		10-50	0	X	550		0-5%	0-1%			X		X	
Pennsylvania	0.9	21%	3%	12%		100-200	0	X	506	3	0-5%	1-2.5%		X	X		X	
Utah	0.9	20%	5%	10%		50-100		X	1054		5-10%	1-2.5%			X		X	
Maryland	0.8	45%	5%	8%		10-50	0		160		<0%	2.5-5%			X			
Iowa	0.8	11%	3%	11%		50-100			123	2	0-5%	0-1%			X	X	X	
Vermont	0.8	6%	2%	11%		<10		X	81		<0%	>5%			X		X	
Connecticut	0.7	29%	7%	9%		10-50	3	X	93		5-10%	1-2.5%			X		X	
Washington	0.7	28%	6%	12%		100-200		X	888		10-15%	2.5-5%						
Minnesota	0.5	17%	4%	10%		10-50		X	2037	3	5-10%	1-2.5%					X	
New Hampshire	0.2	8%	2%	8%		10-50	0	X	358		0-5%	0-1%						

Numeric data highlighted in yellow denotes that the statistic is above a national average, or mean/median rate.  
 Non-numeric data (X) highlighted in yellow denotes a state is "at-risk" for the indicator--e.g., States with "X" have suffered from significant floods historically.  
 Composite Score of 4.0 means a state is most vulnerable to climate change, 0.0 being least vulnerable.  
 \*Major hurricane is defined as Category 3, 4 or 5.  
 \*\*Significant floods are defined as those with highest death rates and cost, as designated by USGS.

# APPENDIX B: KEY INFORMANT INTERVIEW PROTOCOL

## CLIMATE CHANGE AND ENVIRONMENTAL CHALLENGES FOR VULNERABLE COMMUNITIES

Texas Health Institute

### KEY INFORMANT INTERVIEW QUESTION GUIDE

Final Version

#### I. INTRODUCTION

Thank you for taking the time to speak with me today. My name is [Maria Rascati/Nadia Siddiqui] and I am a public health researcher with the Texas Health Institute, a non-profit organization with the mission of improving the health of communities through education, research and health policy development.

The purpose of our call today is to discuss climate-related issues affecting your state and communities. We are working with the Joint Center for Political and Economic Studies, in Washington, D.C., to study the impact of climate or related weather and environmental issues, such as extreme heat, drought, air pollution, hurricanes and floods, on vulnerable communities and to recommend equitable and fair solutions to enable these communities to better prepare for and adapt to such events.

The focus of this study is particularly on vulnerable communities of color—or those that are racially, ethnically or linguistically diverse—given the disproportionate burden of loss, injury, disease and death these populations often face in public health and climate-related events. In addition, our work concentrates on six states in Southern U.S., including Arizona, Arkansas, Louisiana, New Mexico, Oklahoma and Texas, and Tribal Nations in the south.

We are analyzing publicly available data for these states on measures of socioeconomic status, culture and language, environment, weather and public health to understand challenges and concerns facing vulnerable communities of color in these states related to climate and weather. In addition, we are analyzing leading research and literature, along with conducting a content analysis of programs and

policies on this topic. To complement these sources and to fill gaps in information, we are speaking with state, local and community representatives, like yourself, having knowledge or expertise on this topic.

Your comments and feedback today will help us identify primary climate or weather-related challenges and concerns facing vulnerable communities of color in your state as well as help direct us toward programs and policies to address these concerns. We would like to incorporate your feedback in a report for the Texas Health Institute and the Joint Center for Political and Economic Studies. Please be assured that your responses and identity will be kept anonymous, unless we receive special permission from you to include a direct quote in our report.

I also want to inform you that to capture your comments and insights most accurately, I will be typing your responses. Please let me know if you have any questions regarding the study or the interview process, before we proceed. Ok, so let's get started.

#### II. QUESTIONS

##### Question 1

What do you see as the three leading climate or related weather and environmental challenges affecting the state (or the community within which you live)?

##### Question 2

Are there racial/ethnic sub-populations that are more vulnerable to these climate or environmental-related hazards?

- A. Please provide specific examples of sub-populations that are more vulnerable in your state or community.
- B. Can you reflect on any specific events or consequences these populations have faced due to weather, climate and environmental issues.

##### Question 3

What federal, state or local actions have been taken to prepare for, adapt or respond to climate or related weather and environmental events?

- A. Is there a state advisory panel and/or state-level planning to respond and adapt to climate-related concerns?
- B. Please reflect on programs and policies addressing climate issues broadly.
- C. Now, I would like you to reflect on programs and policies that address these issues among the vulnerable communities you identified previously.

##### Question 4:

What more needs to be done to effectively prepare, adapt or respond to vulnerable, racially/ethnically diverse communities as we continue to face climate-related challenges?

- A. Are there already assets within the community that can be tapped to build such capacity? Ask to explain.
- B. What do you see as the three most promising opportunities for the state in addressing this issue?
- C. What are your three greatest concerns moving forward—[Don't read: probe only if necessary e.g., Financing? Politics?]

##### Question 5:

Are there any sources of information that you would recommend we tap for this study?

#### III. CLOSING REMARKS

These are all the questions I have for you. Thank you so much for your time. It was a pleasure speaking with you. Do you have any additional comments? Or would you like to add anything you feel I may have missed? Again, thank you. Your comments and feedback will be valuable in shaping our report as well as in guiding recommendations for future program and policy development on preparing and responding to vulnerable communities for weather, climate and related environmental issues.

# APPENDIX C: NATIONAL COMPENDIUM OF LITERATURE ON CLIMATE CHANGE AND DIVERSE POPULATIONS

TITLE	Understanding The Cumulative Impacts Of Inequalities In Environmental Health	The 2006 California Heat Wave: Impacts on Hospitalizations and Emergency Department Visits	The Climate Gap: Inequalities in How Climate Change Hurts Americans and How to Close the Gap
TYPE OF RESOURCE	Research	Report	Report
SUMMARY OF KEY FINDINGS	Racial and ethnic minority groups and low-income communities are more frequently exposed to multiple environmental hazards and social stressors, including poverty, poor housing quality, and social inequality. Residents living near hazardous waste, industrial and sewage treatment facilities can be exposed to more pollutants than people who live in more affluent neighborhoods located farther from these sources of pollution	Significantly increased rates of ED visits and hospitalizations for cardiac-related illnesses statewide (acute MI and cardiovascular disease cause codes) only among Latinos/Hispanics, which could be related to occupational heat exposures among Latino/Hispanic crop workers.	1. African Americans in Los Angeles Nearly Twice as Likely to Die from a Heat Wave. 2. Positive relationship between the presence of concrete, heat-trapping surfaces and community poverty, and a negative relationship between the amount of tree cover and the level of community poverty in four California urban areas. 3. The socioeconomic status of predominantly Mexican and Central American immigrants who come to California to work in the agricultural and construction sectors makes them particularly vulnerable because of the cumulative impacts of their long workdays under strenuous conditions, limited capacity to protect their rights, and exposure to chemicals such as pesticides. 4. Transportation Is also a Critical Coping Tool During a Heat Wave—but African Americans, Latinos and Asians Less Likely to have Access to a Car. 5. In California, as of 2003, agriculture provided approximately 500,000 jobs with 315,000 of them being held by Latinos
RACIAL/ETHNIC GROUP(S)	Minorities	Hispanic/Latino	African American, Mexican and Central American immigrants
GEOGRAPHIC REGION	-	California	California
CLIMATE ISSUE(S)	Air and water pollution, hazardous waste sites, industrial facilities, sewage treatment plants	Heat Wave	Heat Wave
MEASURE(S) OF VULNERABILITY	<ul style="list-style-type: none"> <li>Poverty, poor housing quality, social inequality</li> <li>Intrinsic Factors (age, genetics and gene expression, preexisting health conditions)</li> <li>Extrinsic Factors (Social vulnerability)</li> </ul>	Occupational heat exposure, age, race/ethnicity	Socioeconomic factors: low-income urban neighborhoods and communities of color
MEASURE(S) OF HEALTH OUTCOMES	Perinatal outcomes (low birthweight and prematurity), cardiovascular disease, self-rated health	Increased rates of ED visits and hospitalizations, acute renal failure, nephritis/nephrotic syndrome, Acute MI, cardiovascular diseases, cerebrovascular disease, diabetes, and respiratory illnesses	Increased ozone related deaths, hospitalization, and asthma
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	There is a need for targeted place-based and proactive approaches to policy making. One approach is to use cumulative impact screening to map, characterize, and target vulnerable communities for interventions that improve existing conditions and prevent future harm. The use of cumulative impact screening could remove this burden of proof from vulnerable communities and increase the likelihood that disadvantaged neighborhoods will receive focused regulatory attention. Several agencies,	Interventions should include improving community access to air conditioning, encouraging increased fluid intake, and advising temporarily decreased physical activity. Heat wave response plans could be adapted with improved surveillance. Culturally and socially appropriate messaging through public service announcements. Syndromic surveillance programs that collect reports in real time from EDs or doctors' offices to identify rapidly emerging morbidity during a heat wave	1. Close the Climate Gap by Auctioning Permits or Establishing a Fee and Invest in Communities That Will be Hardest Hit. 2. Close the Climate Gap by Maximizing Reductions in Greenhouse Gas Emissions and Toxic Air Pollution in Neighborhoods with the Dirtiest Air. 3. Focus Planning and Intervention in Poor and Minority Neighborhoods. 4. Use New Mapping Technologies to Identify Vulnerable Neighborhoods. 5. Research the Potential Benefits and Harms of New Fuels. 6. Measure the Success of Mitigation Strategies by Whether They Protect Everyone. 7. Design Research That Identifies Opportunities for Targeting Greenhouse Gas Reductions to Reduce Toxic Air Emissions in Highly Polluted Neighborhoods
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	N/A	N/A	Increases in the frequency and the intensity of extreme weather events will expose agriculture to greater productivity risks
CITATION	Morello-Frosch, R., Zuk, M., Jerrett, M, Shamasunder, B. and Kyle, A.D. Understanding the Cumulative Impacts of Inequalities in Environmental Health: Implications for Policy. Health Affairs, Vol. 30, No.5, 879-887, May 2011	Knowlton K, Rotkin-Ellman M, King G, Margolis HG, Smith D, Solomon G, Trent R, English P. The 2006 California heat wave: Impacts on hospitalizations and emergency department visits. Environ. Health Perspect, 2009; 117(1): 61-7	Morello-Frosch R., Pastor P., Saad J., Shonkoff S.B. The Climate Gap: Inequalities in How Climate Change Hurts Americans & How to Close the Gap.
LINK	<a href="http://www.ncbi.nlm.nih.gov/pubmed?term=Understanding%20The%20Cumulative%20Impacts%20Of%20Inequalities%20In%20Environmental%20Health%3A%20Implications%20For%20Policy">http://www.ncbi.nlm.nih.gov/pubmed?term=Understanding%20The%20Cumulative%20Impacts%20Of%20Inequalities%20In%20Environmental%20Health%3A%20Implications%20For%20Policy</a>	<a href="http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2627866/">http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2627866/</a>	<a href="http://dornsife.usc.edu/pere/documents/The_Climate_Gap_Full_Report_FINAL.pdf">http://dornsife.usc.edu/pere/documents/The_Climate_Gap_Full_Report_FINAL.pdf</a>

TITLE	A Multicounty Analysis Identifying the Populations Vulnerable to Mortality Associated with High Ambient Temperature in California	Public Health Impacts of Climate Change in California: Community Vulnerability Assessments and Adaptation Strategies	MMWR Heat-Related Deaths Among Crop Workers --- United States, 1992--2006
TYPE OF RESOURCE	Research	Report	Report
SUMMARY OF KEY FINDINGS	Emergency department visits for heat-related illnesses increased across California, especially in the Central Coast, including San Francisco 2. Low-income African Americans (Basu and Ostro 2008) appear more likely to get sick or die from heat wave effects than others	1. Low-income families and people of color are less likely to have access to air-conditioning (particularly along the coast of Sonoma to San Diego counties. Of those who have air conditioning, lower income households are more likely to have room air conditioners and evaporative coolers versus central air conditioning. These are not as effective as the central air conditioning in reducing temperatures 2. 64% of heat-related death cases occurred in socioeconomically depressed areas	1. Nearly all deceased crop workers were male. Approximately 20 (71%) of the 28 deceased crop workers were from Mexico or Central and South America. Nearly 60% of all heat-related deaths among crop workers occurred in July.
RACIAL/ETHNIC GROUP(S)	African American	Low Income Minorities	Hispanic/Latino
GEOGRAPHIC REGION	California	California	<ul style="list-style-type: none"> <li>California</li> <li>Florida</li> <li>North Carolina</li> </ul>
CLIMATE ISSUE(S)	Heat Wave	Heat Wave	Heat Wave
MEASURE(S) OF VULNERABILITY	Age, racial/ethnic group, gender, educational level, place of death	Social and behavioral factors (living alone), Health status, Demographics, Air conditioning ownership	<ul style="list-style-type: none"> <li>Crop workers</li> <li>Foreign-born workers</li> </ul>
MEASURE(S) OF HEALTH OUTCOMES	Cardiovascular and Respiratory causes of death	Heat stress, heat cramps, Heat syncope, heat edema, heat exhaustion, heat stroke	Heat-related death
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	1. People with preexisting cardiovascular disease, the elderly, and Blacks should be especially targeted to prevent heat-related mortality. 2. In several cities, group-watch alerts have been implemented and have been successful at reducing mortality during heat waves.	<p>Short term: 1. Establishment and availability of transportation to cooling centers for vulnerable populations in each county. 2. Education of social contacts of at-risk populations is needed. 3. Education of personal cooling strategies and first aid for heat illness is recommended</p> <p>Long term: 1. Attention be given to areas of the state that is less prepared for extreme heat events. ex. Humboldt county has only medium air conditioner ownership, higher proportion of elderly living alone. 2. Land use and city planners are advised to work with public health officials 3. Early and accurate heat warning systems should be developed 4. Surveillance systems should be developed to allow rapid tracking of sentinel cases of heat-related illnesses.</p>	Guidance to help agricultural employers establish a heat-illness prevention program is available from CDC and the U.S. Environmental Protection Agency. In addition, the Department of the Army and Air Force has published a technical bulletin that provides strategies for employers to control heat stress
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	N/A	Low-income families along the coast of Sonoma to San Diego were less likely to have access to air-conditioning	During 1992--2006, a total of 68 crop workers died from heat stroke, representing a rate nearly 20 times greater than for all U.S. civilian workers.
CITATION	Basu, R., and B. D. Ostro. 2008. "A Multicounty Analysis Identifying the Populations Vulnerable to Mortality Associated with High Ambient Temperature in California." Am J Epidemiol 168(6): 632--637.	English, P., K. Fitzsimmons, S. Hoshiko, T. Kim, H. G. Margolis, T. E. McKone, M. Rotkin-Ellman, G. Solomon, R. Trent, and Z. Ross. 2007. Public health impacts of climate change in California: Community vulnerability assessments and adaptation strategies. Climate Change Public Health Impacts Assessment and Response Collaborative, California Department of Public Health Institute, Richmond, California	Luginbuhl RC, Jackson LL, Castillo DN, Loring KA. 2008. Heat related deaths among crop workers— United States, 1992–2006. MMWR Morb Mortal Wkly Rep 57:649–653
LINK	<a href="http://www.ncbi.nlm.nih.gov/pubmed?term=A%20multicounty%20analysis%20identifying%20the%20populations%20vulnerable%20to%20mortality%20associated%20with%20high%20ambient%20temperature%20in%20California">http://www.ncbi.nlm.nih.gov/pubmed?term=A%20multicounty%20analysis%20identifying%20the%20populations%20vulnerable%20to%20mortality%20associated%20with%20high%20ambient%20temperature%20in%20California</a> .	<a href="http://www.phi.org/pdf-library/Heat_Vulnerability_2007.pdf">http://www.phi.org/pdf-library/Heat_Vulnerability_2007.pdf</a>	<a href="http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5724a1.htm">http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5724a1.htm</a>

TITLE	Heat-related deaths during the July 1995 heat wave in Chicago	Preparing for a Changing Climate: The Potential Consequences of Climate Variability and Change	Heat waves and Global Climate Change
TYPE OF RESOURCE	Research	Workshop	Report
SUMMARY OF KEY FINDINGS	<p>1. Those at greatest risk of dying from the heat were people with medical illnesses who were socially isolated and did not have access to air conditioning</p> <p>2. Risk of death was reduced for people with working air conditioners and those with access to transportation</p> <p>3. The presence of air conditioning was inversely associated with mortality from both heat and cardiovascular causes</p> <p>4. Living in an apartment was associated with increased risk, particularly if no air conditioner was available in the lobby.</p>	<p>The results of various climate change model predictions suggest that there will be increases in precipitation on the order of 10% for all of the Gulf states, except Florida. The initial objectives for the Gulf Coast region were to assess potential consequences of climate change for the region, (No Suggestions) wetlands, forests, water and air quality, energy and commerce, recreation and community life</p>	<p>Populations at Increased Risk:</p> <p>1. Urban populations-a heat wave causes higher daytime and nighttime temperatures in cities than in rural areas because buildings and asphalt absorb more heat than do trees and plants, while rural areas cool after the sun goes down.</p> <p>2. Lower SES-Studies have indicated that lower SES is a risk factor for heat-related mortality. For example, heat wave deaths in St. Louis in 1966 were the highest in inner city areas where population density was higher, open spaces were fewer, and where SES was lower than in surrounding areas</p>
RACIAL/ETHNIC GROUP(S)	African American, White	Minorities including African Americans, Hispanics, Asians, and Native Americans were represented	N/A
GEOGRAPHIC REGION	Chicago	Gulf Coast region (Texas, Louisiana, Mississippi, Alabama, Florida)	Midwest US
CLIMATE ISSUE(S)	Heat Wave	Heat wave, drought, flooding, tropical storms, tornado, hurricane, wildfires, air pollutants	Heat waves, wildfires
MEASURE(S) OF VULNERABILITY	Age, housing, those with medical illnesses	N/A	Age, lower socio-economic status
MEASURE(S) OF HEALTH OUTCOMES	Cardiovascular cause of death and Heat-related death	Heat shock, asthma, respiratory disease, and allergies.	Heat stroke, cardiovascular and respiratory disease, death
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	N/A	The Gulf Coast region has collaborated with China through the Chinese Academy of Sciences. The Gulf Coast region also established collaborative efforts with scientists in Italy, Canada, and Jamaica. The Italian scientists organized special seminars and lectures in three universities /institutes for the Gulf Coast region team members. Team members provided technical assistance to the Jamaican Ministry of Agriculture and Forestry Department on management and conservation of the national forests in a changing climate.	N/A
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	N/A	The Mississippi River carries the chemical pollutants of the Central U.S. to the Gulf Coast region. Large cities such as Houston and New Orleans already have significant problems with air pollution, particularly tropospheric ozone (O3)	The model did a good job of simulating the amplitude and the geographic pattern of observed heat wave intensity over North America. Both the model results and the observations show that heat waves are most severe over the Eastern Seaboard, the southern and upper Midwest, and the southwestern United States
CITATION	Semenza, J. C., C. H. Rubin, K. H. Falter, J. D. Selanikio, W. D. Flanders, H. L. Howe, and J. L. Wilhelm. 1996. "Heat related deaths during the July 1995 heat wave in Chicago." N Engl J Med 335(2): 84-90	Ning, Z.H., Turner, R.E., Doyle, T., Abdollahi, K. Preparing for a Changing Climate: The potential Consequences of Climate Variability and Change-Gulf Coast Region. June 2003	Ebi K. L., Meehl, G. A. Heatwaves and Global Climate Change: The Heat is on: Climate Change and Heatwaves in the Midwest. December 2007.
LINK	<a href="http://www.ncbi.nlm.nih.gov/pubmed/8649494">http://www.ncbi.nlm.nih.gov/pubmed/8649494</a>	<a href="http://www.usgcrp.gov/usgcrp/Library/nationalassessment/gulfcoast/gulfcoast-brief.pdf">http://www.usgcrp.gov/usgcrp/Library/nationalassessment/gulfcoast/gulfcoast-brief.pdf</a>	<a href="http://www.pewclimate.org/docUploads/Regional-Impacts-Midwest.pdf">http://www.pewclimate.org/docUploads/Regional-Impacts-Midwest.pdf</a>

TITLE	Exposed: Social Vulnerability and climate change in the US Southeast	Health Problems Heat Up: Climate Change and the public's health
TYPE OF RESOURCE	Report	Report
SUMMARY OF KEY FINDINGS	<p>1. The Social Vulnerability Index is a quantitative measure of social vulnerability to environmental hazards. SoVI provides a way to measure the difference in social vulnerability across states and regions within states. The SoVI uses 32 variables to define the multiple dimensions of vulnerability—called components—and then adds them up to arrive at a single reference point to measure vulnerability. Eight components account for most of the variation in social vulnerability in the study: wealth, age, race, gender, ethnicity, rural farm populations, special needs populations, and employment status. 2. Across the Southeast where rural counties are composed mostly of populations disadvantaged by poverty, race, ethnicity, age, and gender, four climate hazards in particular threaten such socially vulnerable populations: drought, hurricane force winds, flooding, and sea-level rise. 3. An example are Latino communities with some of the highest hazard exposures and highest elevated social vulnerability scores. Local government early warning systems (if existent), face challenges in reaching all Latino families—some are undocumented and either may avoid government evacuations for fear of deportation, or may be unable to read emergency materials written in English. 4. The Social Vulnerability Index ... is a first step toward developing hazard reduction strategies and improving resilience for some of the nation's most disadvantaged areas. 5. Roughly 80 percent of all U.S. counties that experience persistent poverty lie in this region</p>	<p>Only 12 states have established climate change commissions that include a representative from the state's public health department; Twenty-two states and New York City have received grants from the U.S. Centers for Disease Control and Prevention (CDC) for Environmental Health Tracking, to track connections between health problems and the environment; Thirty-three states have received CDC funds for state asthma control programs; and Every state except Alaska has received funds to track diseases spread through mosquitoes and other insects</p> <p>CEAC cited the following findings from its paper, Global Warming and African Americans, in describing the disproportionate impacts of climate change on Africans Americans: 1. Urban dwelling: Because of the "heat island effect," temperature increases are expected to be more extreme in urban areas, where blacks are more than twice as likely to live than whites. 2. Energy consumption: More African Americans will be "fuel-poor" as the demand for energy rises due to higher air-conditioning loads, population growth, and urbanization. African Americans already spend an estimated 25 % greater share of their income on energy than the national average, and total spending is rising in the face of increasing gasoline and resource prices. 3. Population displacement: Hurricane Katrina displaced more than 700,000 Americans, and poor African Americans represent a disproportionate percentage of the displaced. New Orleans' African American population has fallen to less than 60 % of its pre-hurricane levels. 4. Heat-related deaths: During the 1995 Chicago heat wave, the African American death rate was 1.5 times the rate for non-Hispanic whites. The correlation between lower air conditioning prevalence in African American households and higher heat-related mortality was noted in a study of heat-related deaths in four major U.S. cities. African Americans in the cities had half the rate of air conditioning penetration as whites and almost three times the percent increase in deaths</p>
RACIAL/ETHNIC GROUP(S)	African Americans, Hispanics	African American
GEOGRAPHIC REGION	Drought, hurricane force winds, flooding, and sea-level rise	US; urban and rural communities, coastal, low lying and mountain regions, and polar regions
CLIMATE ISSUE(S)	Wealth, age, race, gender, ethnicity, rural farm populations, special needs populations, and employment status	Heat waves, Poor air quality, hurricanes, floods, wildfires, droughts, increased average temperature, rising CO2 levels
MEASURE(S) OF VULNERABILITY	N/A	Living alone, living on higher floors, living in poverty, living without air conditioning, and using special and excessive medications
MEASURE(S) OF HEALTH OUTCOMES	<p>1. Pass climate change legislation that reduces greenhouse gas emissions, and includes effective and well-resourced domestic and international adaptation programs. 2. Strengthen local, state, and regional disaster preparedness and response plans by identifying and prioritizing assistance to those communities least able to cope when disaster strikes. 3. Promote community programs to help with rebuilding projects that make homes and businesses more resilient to high winds and flooding to prepare and evacuate vulnerable populations during intense storms.</p>	<p>Heat Waves-Death, heat stroke, heat exhaustion, and kidney stones. Air Quality-Increased asthma. Increase chronic obstructive pulmonary disease (COPD). Hurricanes-Death from drowning, injuries, depression, post-traumatic stress disorder. Increased monoxide poisoning, increased gastrointestinal illnesses. Floods-increased water and food borne diseases. According to the Intergovernmental Panel on Climate Change, vulnerable populations are more likely to suffer from the health effects of climate change, including: Increases in malnutrition and consequent disorders, with implications for child growth and development, Increased deaths, disease and injury due to heat waves, floods, storms, fires and droughts, increased burden of diarrheal disease increased frequency of cardio-respiratory diseases and increased exposure to infectious disease vectors.</p>
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	<p>Drought exposure is highest in western Texas, followed by Florida, South Carolina, and western Georgia. Almost three-quarters of South Carolina experienced extreme drought during the past three decades. Nearly 38 % of the land area from south Texas to the Delmarva Peninsula in Maryland region is within the hurricane wind zone. Sharkey County, MS not only has the highest level of social vulnerability in the state, 79 percent of the population falls within a 100-year floodplain</p>	<p>In May 2009 the State Environmental Health Indicator Collaborative (SEHC) published a report, Environmental Health Indicators of Climate Change, outlining a series of indicators that could be used for climate change, including surveillance data on climate change-related health outcomes. The 28 indicators are intended to assess vulnerability to climate change-related events and preparedness for these events. They are categorized into four groups: Environmental; Morbidity and Mortality; Vulnerability; and Mitigation, Adaptation, and Policy.</p> <p>Congress should provide funding for state and local health departments to conduct needs assessments and strategic planning for public health considerations of climate change; The White House and the federal interagency working group on climate change should take into account the potential health implications of policies and programs under consideration; Congress should increase support for tracking of environmental effects on health and research into health effects of climate change; CDC should set national guidelines and measures for core public health functions related to climate change, and in exchange for federal funding for climate change planning and response, CDC should require states and localities to report the findings to both the public and the federal government; All state and local health departments should include public health considerations as part of climate change plans, including conducting needs assessments, developing strategic plans, and creating public education campaigns; and Special efforts must be made to address the impact of climate change on at-risk and vulnerable communities.</p>
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	N/A	<p>Residents of the northeastern United States, from West Virginia to Maine, will face more extreme heat and worsening air quality as a result of climate change. Researches predict that populations in high-density urban areas with poor housing will be at increased risk with increases in the frequency and intensity of heat waves, partly due to the interaction between increasing temperatures and urban heat-island effects. Two socio-demographic trends -- the aging of the U.S. population and the growing numbers of obese Americans -- make the United States particularly vulnerable to weather-related disasters. Elderly are more vulnerable than younger age groups to injury resulting from weather extremes such as heat waves, storms, and floods.</p>
CITATION	Exposed: Social vulnerability and climate change in the U.S. Southeast. Oxfam America. 2009.	Levi, J., Vinter, S., Gratale, D., Juliano, C., Segal, L.M. Health Problems Heat Up: Climate Change and the Public's Health. Trust for America's Health. October 2009.
LINK	<a href="http://adapt.oxfamamerica.org/resources/Exposed_Report.pdf">http://adapt.oxfamamerica.org/resources/Exposed_Report.pdf</a>	<a href="http://healthyamericans.org/reports/environment/TFAHClimateChangeWeb.pdf">http://healthyamericans.org/reports/environment/TFAHClimateChangeWeb.pdf</a>

TITLE	Social Vulnerability to Climate Change: A Neighborhood Analysis of the Northeast U.S. Megaregion	Preparing a People: Climate Change and Public Health	A Climate of Change: African Americans, Global Warming, and a Just Climate Policy for the U.S.
TYPE OF RESOURCE	Research	Report	Report
SUMMARY OF KEY FINDINGS	The objective of this paper was to use neighborhood level data from 2000 Census to construct a comparative megaregion index of social vulnerability to climate change	<p>Researchers have noted a clear link between increased rainfall and a rise in diarrheal illnesses following heavy rains that overwhelm sewers and water systems.</p> <p>A few cities—primarily either those that have recently experienced devastating weather-related events or those located along the coasts—are preparing climate change adaptation plans, but still fewer of these include actions the public health community should be taking.</p>	<p>1. African Americans Are at Greater Risk from Climate Change and Global Warming Co-Pollutants: African Americans suffer heat death at one hundred fifty to two hundred percent of the rate for non-Hispanic whites. 71% of African Americans live in counties in violation of federal air pollution standards, as compared to 58% of the white population. 78% of African Americans live within thirty miles of a coal-fired power plant, as compared to 56% of non-Hispanic whites. African Americans have a 36% higher rate of incidents of asthma than whites.</p> <p>2. African Americans Are Economically More Vulnerable to Disasters and Illnesses: Racist stereotypes have been shown to reduce aid donations and impede service delivery to African Americans in the wake of hurricanes, floods, fires and other climate-related disasters as compared to non-Hispanic whites in similar circumstances.</p> <p>3. African Americans Are at Greater Risk from Energy Price Shocks: African Americans spend 30% more of their income on energy than non-Hispanic whites</p>
RACIAL/ETHNIC GROUP(S)	African American (5.79% of model)	N/A	African American
GEOGRAPHIC REGION	Northeastern U.S Megaregion, Boston, Hartford, New York – New Jersey, and Philadelphia	U.S. (Chicago, California bay area)	U.S.
CLIMATE ISSUE(S)	Heat wave, air pollution	Heat Waves, Hurricanes	Heat Wave, Air Pollutants, Natural disasters, Floods, Fires, Tropical storms
MEASURE(S) OF VULNERABILITY	Language and literacy barriers, disabilities, education level, Race, Ethnicity, and Gender, age, lack of phone and car	Income	Proximity to hazardous materials & air pollutants Economic factors
MEASURE(S) OF HEALTH OUTCOMES	Increasing the amount of vegetative cover and higher albedo surface materials can reduce temperatures and air pollution, consequently reducing negative health effects.	Asthma, food borne illness, and infectious disease	Heat deaths
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	Vulnerability maps also could be used as a response tool. The creation of a heat wave warning systems is one such example. Other sustainable hazards programs might include contingency plans for establishing community cooling stations in public buildings. In the case of immigrants and those with lack of information regarding hazards, community or state resources can be allocated to promote the use of interpreters, victim advocates, and media outlets to raise awareness	Alameda County is just starting to partner with the Adapting to Rising Tides planning effort to conduct a vulnerability assessment on certain likely scenarios and determine the response of the Public Health Department The Adapting to Rising Tides program is a partnership of the San Francisco Bay Conservation and Development Commission and the National Oceanic and Atmospheric Administration (NOAA) Coastal Services Center that is designed to help Bay Area communities begin planning for sea-level rise.	A well-designed climate and energy policy— one that is financed by polluters—can rapidly substitute energy efficiency and new clean energy technologies for polluting energy sources while strengthening the economy, creating jobs, improving income distribution and improving the relative economic position of African Americans. There are three broad kinds of future energy scenarios that can be defined by who will pay for global warming, each of which has powerful advocates. They will be called the phony reductions future, the corporate windfalls future, and the polluter-pays future.
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	N/A	N/A	U.S. is using 636 percent of its fair share, while the rest of the developed West uses a little more than half that
CITATION	Cox J., Rosenzweig C., Solecki W., Goldberg R., Kinney P. Social Vulnerability to Climate Change: A Neighborhood Analysis of the Northeast U.S. Megaregion. Social Vulnerability to Climate Change. Nov 15, 2006.	Cooney CM 2011. Preparing a People: Climate Change and Public Health. Environ Health Perspect 119:a166-a171.	Hoerner, J. A., Robinson, N. A Climate of Change African Americans, Global Warming, and a Just Climate Policy for the U.S. Environmental Justice and Climate Change Initiative 2008.
LINK	<a href="http://www.northeastclimateimpacts.org/pdf/tech/cox_et_al.pdf">http://www.northeastclimateimpacts.org/pdf/tech/cox_et_al.pdf</a>	<a href="http://ehp03.niehs.nih.gov/article/info:doi%2F10.1289%2Fehp.119-a166">http://ehp03.niehs.nih.gov/article/info:doi%2F10.1289%2Fehp.119-a166</a>	<a href="http://www.greenmv.org/reports/climateofchange.pdf">http://www.greenmv.org/reports/climateofchange.pdf</a>



TITLE	Social Vulnerability to Climate Change: A Neighborhood Analysis of the Northeast U.S. Megaregion	Preparing a People: Climate Change and Public Health	A Climate of Change: African Americans, Global Warming, and a Just Climate Policy for the U.S.
TYPE OF RESOURCE	Research	Report	Report
SUMMARY OF KEY FINDINGS	The objective of this paper was to use neighborhood level data from 2000 Census to construct a comparative megaregion index of social vulnerability to climate change	<p>Researchers have noted a clear link between increased rainfall and a rise in diarrheal illnesses following heavy rains that overwhelm sewers and water systems.</p> <p>A few cities—primarily either those that have recently experienced devastating weather-related events or those located along the coasts—are preparing climate change adaptation plans, but still fewer of these include actions the public health community should be taking.</p>	<p>1. African Americans Are at Greater Risk from Climate Change and Global Warming Co-Pollutants: African Americans suffer heat death at one hundred fifty to two hundred percent of the rate for non-Hispanic whites. 71% of African Americans live in counties in violation of federal air pollution standards, as compared to 58% of the white population. 78% of African Americans live within thirty miles of a coal-fired power plant, as compared to 56% of non-Hispanic whites. African Americans have a 36% higher rate of incidents of asthma than whites.</p> <p>2. African Americans Are Economically More Vulnerable to Disasters and Illnesses: Racist stereotypes have been shown to reduce aid donations and impede service delivery to African Americans in the wake of hurricanes, floods, fires and other climate-related disasters as compared to non-Hispanic whites in similar circumstances.</p> <p>3. African Americans Are at Greater Risk from Energy Price Shocks: African Americans spend 30% more of their income on energy than non-Hispanic whites</p>
RACIAL/ETHNIC GROUP(S)	African American (5.79% of model)	N/A	African American
GEOGRAPHIC REGION	Northeastern U.S Megaregion, Boston, Hartford, New York – New Jersey, and Philadelphia	U.S. (Chicago, California bay area)	U.S.
CLIMATE ISSUE(S)	Heat wave, air pollution	Heat Waves, Hurricanes	Heat Wave, Air Pollutants, Natural disasters, Floods, Fires, Tropical storms
MEASURE(S) OF VULNERABILITY	Language and literacy barriers, disabilities, education level, Race, Ethnicity, and Gender, age, lack of phone and car	Income	Proximity to hazardous materials & air pollutants Economic factors
MEASURE(S) OF HEALTH OUTCOMES	Increasing the amount of vegetative cover and higher albedo surface materials can reduce temperatures and air pollution, consequently reducing negative health effects.	Asthma, food borne illness, and infectious disease	Heat deaths
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	Vulnerability maps also could be used as a response tool. The creation of a heat wave warning systems is one such example. Other sustainable hazards programs might include contingency plans for establishing community cooling stations in public buildings. In the case of immigrants and those with lack of information regarding hazards, community or state resources can be allocated to promote the use of interpreters, victim advocates, and media outlets to raise awareness	Alameda County is just starting to partner with the Adapting to Rising Tides planning effort to conduct a vulnerability assessment on certain likely scenarios and determine the response of the Public Health Department The Adapting to Rising Tides program is a partnership of the San Francisco Bay Conservation and Development Commission and the National Oceanic and Atmospheric Administration (NOAA) Coastal Services Center that is designed to help Bay Area communities begin planning for sea-level rise.	A well-designed climate and energy policy— one that is financed by polluters—can rapidly substitute energy efficiency and new clean energy technologies for polluting energy sources while strengthening the economy, creating jobs, improving income distribution and improving the relative economic position of African Americans. There are three broad kinds of future energy scenarios that can be defined by who will pay for global warming, each of which has powerful advocates. They will be called the phony reductions future, the corporate windfalls future, and the polluter-pays future.
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	N/A	N/A	U.S. is using 636 percent of its fair share, while the rest of the developed West uses a little more than half that
CITATION	Cox J., Rosenzweig C., Solecki W., Goldberg R., Kinney P. Social Vulnerability to Climate Change: A Neighborhood Analysis of the Northeast U.S. Megaregion. Social Vulnerability to Climate Change. Nov 15, 2006.	Cooney CM 2011. Preparing a People: Climate Change and Public Health. Environ Health Perspect 119:a166-a171.	Hoerner, J. A., Robinson, N. A Climate of Change: African Americans, Global Warming, and a Just Climate Policy for the U.S. Environmental Justice and Climate Change Initiative 2008.
LINK	<a href="http://www.northeastclimateimpacts.org/pdf/tech/cox_et_al.pdf">http://www.northeastclimateimpacts.org/pdf/tech/cox_et_al.pdf</a>	<a href="http://ehp03.niehs.nih.gov/article/info:doi%2F10.1289%2Fehp.119-a166">http://ehp03.niehs.nih.gov/article/info:doi%2F10.1289%2Fehp.119-a166</a>	<a href="http://www.greenmv.org/reports/climateofchange.pdf">http://www.greenmv.org/reports/climateofchange.pdf</a>

TITLE	Global Climate Change: Global Climate Change Impacts in the United States	Issue brief: Why the EPA Is Important for Latino Families	The Impact of Climate Change on Minorities and Indigenous Peoples, Minority rights group international
TYPE OF RESOURCE	Report	Report	-
SUMMARY OF KEY FINDINGS	<p>1. Native American communities have unique vulnerabilities. . In Alaska, over 100 villages on the coast and in low-lying areas along rivers are subject to increased flooding and erosion due to warming. Warming also reduces the availability and accessibility of many traditional food sources for Native Alaskans. These vulnerable people face losing their livelihoods, their communities, and in some cases, their culture, which depends on traditional ways of collecting and sharing food. 2. Studies specifically examining the impacts of climate change on the African American community in the United States have concluded that they are both economically and physically more vulnerable to climate-related disasters, illness, and price shocks. 3. The urban heat island effect has raised average urban air temperatures by 2-5°F more over the past 100 years. Such temperature increases, on top of the general increase caused by human-induced warming can influence health, comfort, energy costs, air quality, water quality and availability, and violent crime which increases at high temperatures</p>	<p>1. Two-thirds of Latino families reside in areas that do not meet the federal government's air quality standards. 2. Latinos are three times as likely as whites to die from asthma. Latino children are also 60 percent more at risk than white children to have asthma attacks. Data are compiled from the American Lung Association's report "State of the Air 2010: The report details the 25 most polluted U.S. cities as measured by unsafe levels of particulate pollution and ozone. Center for American Progress analysis finds that 7 out of the 25 worst polluted U.S. cities have Latino populations over 40%. The average Latino population in the 10 worst polluted U.S. cities is 33%</p>	<p>Part of the problem is that climate change research tends to focus on economic sectors – water, infrastructure, agriculture, settlements and so on – rather than human groups. climate change is thought of sectorally, in terms of agriculture, water and so on, rather than in terms of a people, group or livelihood. --A Brookings Institution report on the Hurricane Katrina disaster found that 'those areas hit hardest by the flood were disproportionately non-white. Overall, blacks and other minority residents made up 58 % of those whose neighborhoods were flooded, though they encompassed just 45 percent of the metropolitan population. Within the city itself, 80 per cent of people who had lived in the flooded areas were non-white. Escaping the stricken city was harder for people in the flooded areas, because one in five of them had no access to a car, compared to one in ten without access in the dry areas.</p>
RACIAL/ETHNIC GROUP(S)	Native American	Hispanic/Latino	African American
GEOGRAPHIC REGION	US	US	US; World
CLIMATE ISSUE(S)	Heat trapping gasses (carbon dioxide, methane, nitrous oxide, halocarbon, ozone, water vapor), extreme storms, wildfires, floods	Pollution	Flooding, hurricane
MEASURE(S) OF VULNERABILITY	Heat related death, infectious diseases (WNV), food poisoning (salmonella), water poisoning (cryptosporidium, giardia)	Racial/ethnic group, work, health insurance	Lack of car
MEASURE(S) OF HEALTH OUTCOMES	Health risks associated with diabetes will increase the vulnerability of the U.S. population to increasing temperatures. Rising temperature and carbon dioxide concentration increase pollen production and prolong the pollen season in a number of plants with highly allergenic pollen, presenting a health risk	Asthma. Chronic exposure to harmful pesticides in both the air and water leads to increased risks of cancer, birth defects, and neurological damage.	N/A
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	In 1994, EPA established a policy that mandates that communities substantially reduce or eliminate their combined sewer overflow, but this mandate remains unfulfilled. In 2004, the EPA estimated it would cost \$55 billion to correct combined sewer overflow problems in publicly owned wastewater treatment systems. Pest control programs are likely to prevent the large-scale spread of these diseases in the United States	The EPA released its Second Prospective Study Report on March 1, 2011. The striking results show that in 2010 alone the Clean Air Act prevented over 13 million lost work days and 1.7 million asthma attacks. The tragic events in Japan on March 12 reminded the world that the energy sources we rely on can spell an especially horrifying brand of toxic disaster. Through its monitoring efforts in California, the EPA is protecting Latino families and millions of others from the threat of nuclear radiation.	National Adaptation Programmes of Action and national communications (NAPAs) provide: an opportunity for applying principles of equity and justice to ensure that the voices and priorities of the communities that are most vulnerable to climate change are incorporated into the UNFCCC process on adaptation
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	Californians currently experience the worst air quality in the nation. More than 90 percent of the population lives in areas that violate state air quality standards for ground-level ozone or small particles. These pollutants cause an estimated 8,800 deaths and over a billion dollars in health care costs every year in California.	The 25 most polluted cities in the country and their Latino populations, 2010: 1. Bakersfield, CA 2. Fresno-Madera, CA 3. Pittsburgh-New Castle, PA 4. Los Angeles-Long Beach-Riverside, CA 5. Birmingham-Hoover-Cullman, AL etc.	Some academic, non governmental organization (NGO) and media reporting of specific disasters has clearly acknowledged that minority communities have fared worse than others. Examples are the reporting of the New Orleans floods which followed Hurricane Katrina in August 2005, and of the Indian floods in the summer of 2007, in which African Americans and Dalits respectively suffered especially badly.
CITATION	U.S. Global Change Research Program (USGCRP). Global Climate Change Impacts in the United States.	Madrid J., Vasquez V. Why the EPA Is Important for Latino Families: Agency Regulates Harmful Pollution that Threatens Them. Center for American Progress. March 23, 2011.	Baird R., The Impact of Climate Change on Minorities and Indigenous Peoples. Minority Rights Group International. April 2008.
LINK	<a href="http://www.globalchange.gov/what-we-do/assessment/previous-assessments/global-climate-change-impacts-in-the-us-2009">http://www.globalchange.gov/what-we-do/assessment/previous-assessments/global-climate-change-impacts-in-the-us-2009</a>	<a href="http://www.americanprogress.org/issues/2011/03/pdf/epa_latinos_english.pdf">http://www.americanprogress.org/issues/2011/03/pdf/epa_latinos_english.pdf</a>	<a href="http://www2.ohchr.org/english/issues/climatechange/docs/submissions/Minority_Rights_Group_International.pdf">http://www2.ohchr.org/english/issues/climatechange/docs/submissions/Minority_Rights_Group_International.pdf</a>

TITLE	Older People and Climate Change: Vulnerability and Health Effects	Climate Change Indicators in the United States: EPA report	Our Nation's Air - Status and Trends through 2008
TYPE OF RESOURCE	Report	Report	Report
SUMMARY OF KEY FINDINGS	Literature suggests that greater physiological susceptibility and social vulnerability may best account for many of the negative health effects of climate change on older people. The effects of climate change are variable, depending on pre-exposure health status, psychological well-being, and social characteristics. Indeed, turning age 65 does not in itself make a person more vulnerable to the negative effects of climate change. Rather, it is the individual physiological and social factors associated with aging that may bring greater negative impact. These data also suggest that there is a higher concentration of low-income older people in the vulnerable counties .	1. Greenhouse gas emissions caused by human activities increased by 14 percent from 1990 to 2008. Carbon dioxide accounts for most of the nation's emissions and most of this increase. Worldwide, emissions of greenhouse gases from human activities increased by 26 percent from 1990 to 2005. 2. Within the United States, parts of the North, the West, and Alaska have seen temperatures increase the most	6 common pollutants continue to decline. Total emissions of toxic air pollutants have decreased by approximately 40 percent between 1990 and 2005. Acid rain and haze are declining.
RACIAL/ETHNIC GROUP(S)	Elderly population	N/A	N/A
GEOGRAPHIC REGION	US	US	US
CLIMATE ISSUE(S)	Heat waves, Hurricanes, Air pollution	Heat waves, drought, heavy precipitation, tropical cyclone intensity	Ozone and black carbon (BC) both affect public health and climate which contribute to the accelerated rates of warming.
MEASURE(S) OF VULNERABILITY	Social isolation, limited income, lower SES, physiological factors, health conditions	Pre-existing medical conditions	N/A
MEASURE(S) OF HEALTH OUTCOMES	The health effects of climate change on older people can be classified into two categories: (1) those due to the greater exposure of older people to the threat ("the dose" in public health terminology) and (2) those that are a combination of exposure plus greater reactivity as a characteristic of aging (increased physiological susceptibility) or social factors that vary across individuals (social vulnerability).	Heat-Related Deaths	N/A
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	Recommendations for Research: 1. What are trends in migration patterns of older Americans to coastal and other ecologically sensitive areas? What implications do such patterns have for planners and policy makers trying to anticipate the implications of climate change? 2. Which subgroups of the older population are more susceptible to environmental health problems? How can we best establish such differences in risk, and what kind of research is needed to do so? 3. Greater attention to the effects of climate change on vulnerable populations should be made a priority. Leadership at all policy levels is necessary to plan and deliver effective policy to mitigate the negative effects on older populations' health due to a changing climate. What types of research knowledge are needed to inform and influence policymakers? 4. Older people require better information regarding environmental threats (both those directly related to climate change, as well as more general health impacts). Research is needed on communication strategies around health risk. What types of risk communication work best with older populations? What are the most effective methods of informing older people about possible risks? etc.	N/A	In 2007, the U.N. Intergovernmental Panel on Climate Change (IPCC) concluded that climate change is happening now, as evident from observations of increases in global average air and ocean temperatures, widespread snow melt, and rising average sea levels.
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	N/A	Six of the 10 most active hurricane seasons have occurred since the mid-1990s. This increase is closely related to variations in sea surface temperature in the tropical Atlantic.	N/A
CITATION	Filiberto, D., Wethington, E., Pillemer, K., Wells, N. M., Wysocki, M., & Parise, J. T.(2010). Older people and climate change: Vulnerability and health benefits. <i>Generations</i> , 33, 19-25	U.S. Environmental Protection Agency. Climate Change Indicators in the United States Report. April 2010.	Our Nation's Air: Status and Trends through 2008. United States Environmental Protection Agency. February 2010.
LINK	<a href="http://findarticles.com/p/articles/mi_7543/is_200901/ai_n54363529/?tag=mantle_skin;content">http://findarticles.com/p/articles/mi_7543/is_200901/ai_n54363529/?tag=mantle_skin;content</a>	<a href="http://www.epa.gov/climatechange/indicators/pdfs/ClimateIndicators_full.pdf">http://www.epa.gov/climatechange/indicators/pdfs/ClimateIndicators_full.pdf</a>	<a href="http://www.epa.gov/airtrends/2010/">http://www.epa.gov/airtrends/2010/</a>

TITLE	2011 U.S. Greenhouse Gas Inventory Report	Climate Change, the Indoor Environment and Health
TYPE OF RESOURCE	Report	Report
SUMMARY OF KEY FINDINGS	Summarizes the latest information on U.S. anthropogenic greenhouse gas emission trends from 1990-2009. In 2009, total U.S. greenhouse gas emissions were 6,633.2 Tg or million metric tons CO <sub>2</sub> Eq. While total U.S. emissions have increased by 7.3 percent from 1990 to 2009, emissions decreased from 2008 to 2009 by 6.1 %. This decrease was primarily due to (1) a decrease in economic output resulting in a decrease in energy consumption across all sectors; and (2) a decrease in the carbon intensity of fuels used to generate electricity due to fuel switching as the price of coal increased, and the price of natural gas decreased significantly. Since 1990, U.S. emissions have increased at an average annual rate of 0.4 %.	Poor indoor environmental quality is creating health problems today and impairs the ability of occupants to work and learn. There is inadequate evidence to determine whether an association exists between climate change-induced alterations in the indoor environment and any specific adverse health outcomes. However, available research indicates that climate change may make existing indoor environmental problems and introduce new problems by: Altering the frequency or severity of adverse outdoor conditions that affect the indoor environment; Creating outdoor conditions that are more hospitable to pests, infectious agents, and disease vectors that can penetrate the indoor environment; Leading to mitigation or adaptation measures and changes in occupant behavior that cause or exacerbate harmful indoor environmental conditions.
RACIAL/ETHNIC GROUP(S)	N/A	N/A
GEOGRAPHIC REGION	US	US
CLIMATE ISSUE(S)	Greenhouse Gas Emissions	Air Quality, Flooding, Infectious agents, Thermal stress, Building ventilation, weatherization, energy use
MEASURE(S) OF VULNERABILITY	N/A	Access to resources, income, social status, poverty. Intrinsic factors (such as age and health) and Extrinsic factors (such as housing and the availability of and ability to go to shelters during extreme weather events).
MEASURE(S) OF HEALTH OUTCOMES	Sulfur dioxide is also a major contributor to the formation of regional haze, which can cause significant increases in acute and chronic respiratory diseases	Increased allergies, asthma. Higher rates of respiratory illnesses are some health outcomes associated with low ventilation rates
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	<p>Within EPA, the Office of Atmospheric Programs (OAP) is the lead office responsible for the emission calculations provided in the Inventory, as well as the completion of the National Inventory Report and the Common Reporting Format tables.</p> <p>Beginning in 2010, those facilities that emit over 25,000 tons of greenhouse gases (CO<sub>2</sub> Eq.) from stationary combustion across all sectors of the economy are required to calculate and report their greenhouse gas emissions to EPA through its Greenhouse Gas Reporting Program. These data will be used in future inventories to improve the emission calculations through the use of these collected higher tier methodological data.</p>	<p>The EPA should work with such agencies as the CDC to assist state, territorial, and local health and emergency management agencies in efforts to initiate or expand programs to identify populations at risk for health problems resulting from alterations in indoor environmental quality induced by climate change and to implement measures to prevent or lessen the problems.</p> <p>The EPA and other federal agencies should join to develop or refine protocols and testing standards for evaluating emissions from materials, furnishings, and appliances used in buildings and to promote their use by standards-setting organizations and in the marketplace. Standards should include consideration of emissions over the operational life of products and the effects of changes in indoor temperature, dampness, and pests.</p> <p>The EPA should expand and accelerate its efforts to ensure that indoor environmental quality is protected and enhanced in building-weatherization efforts by facilitating research to identify circumstances in which mitigation and adaptation measures may cause or exacerbate adverse exposures; by reviewing and, where appropriate, changing weatherization guidance to prevent these exposures; and by establishing criteria for the certification of weatherization contractors in health-protective procedures.</p>
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	N/A	Implications for the continental United States are that the northern tier of states will become wetter with attendant increased runoff and that the southern states will become drier, especially in the West. In the face of those changing patterns of temperature, precipitation, and extreme events, the range and effects of pathogens and pests are also expected to change
CITATION	U.S. Environmental Protection Agency. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2009. April 15, 2011.	Committee on the Effect of Climate Change on Indoor Air Quality and Public Health. Climate Change, the Indoor Environment, and Health. Institute of Medicine. 2011.
LINK	<a href="http://epa.gov/climatechange/emissions/usinventoryreport.html">http://epa.gov/climatechange/emissions/usinventoryreport.html</a>	<a href="http://www.nap.edu/catalog.php?record_id=13115">http://www.nap.edu/catalog.php?record_id=13115</a>

TITLE	Heat stress and public health: A critical review	How Can We Prevent & Prepare for Health Issues in a Changing Climate
TYPE OF RESOURCE	Research	Report
SUMMARY OF KEY FINDINGS	<p>1. Lack of access to air conditioning is linked to the disproportionate risk of heat-related illness and death among the urban elderly in the United States—particularly those who are low-income or of color</p> <p>2. Individuals on low incomes are more likely to have a chronic disease or other medical risk factors, such as obesity or mental illness, and less adequate types of housing, which will all modify the risk of heat-related mortality.</p>	<p>The U.S. Global Change Research Program (USGCRP) coordinates and integrates federal research on changes in the global environment and their implications for society. Currently, there is no working group dedicated to the impact of climate change on human health. Instead, the Human Contributions and Responses working group lists human health as a significant research topic. Many federal partners, such as the EPA, National Institutes of Health, Centers for Disease Control and Prevention, and others have funded or conducted research on this topic. Public health and medical professionals must play a crucial role in addressing the health impacts of climate change. To ensure that public health professionals are trained and equipped to address these challenges, we must bolster our investment in: research, planning and communicating with the public, and workforce</p>
RACIAL/ETHNIC GROUP(S)	N/A	N/A
GEOGRAPHIC REGION	US, Europe	US
CLIMATE ISSUE(S)	Heat Wave	Heat waves, floods, storms, droughts and wildfires
MEASURE(S) OF VULNERABILITY	<p>Intrinsic: Elderly men, depression, cardiovascular and cerebrovascular conditions, diabetes</p> <p>Extrinsic: Brick houses, top floor apartments with no through ventilation, and closed windows are associated with an increased risk of mortality during a heat wave</p>	N/A
MEASURE(S) OF HEALTH OUTCOMES	Heat illnesses, heat-related death	Increased heat-related deaths and sickness; risks of respiratory infections, aggravation of asthma, increased allergens, and premature death; Increase in the number of people at risk from disease and injury related to floods, storms, droughts and wildfires; mental health impacts; water shortages and malnutrition; and increased incidence of vector-, food-, and water borne diseases. The Rhode Island Department of Health warns that unhealthy levels of ozone can cause throat irritation, coughing, chest pain, shortness of breath, increased susceptibility to respiratory infection, and aggravation of asthma and other respiratory ailments.
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	N/A	<p>1. Needs Assessment: assessment of: The state or community's overall vulnerability to climate change (geographic and community characteristics), identification of vulnerable populations who are most at risk for health impacts.</p> <p>2. Strategic Response Plan: should address: Surveillance- need improved human health surveillance that is integrated with environmental quality and protection monitoring Communication-Health officials need funds to communicate the risks of climate change to the public, vulnerable populations, health care professionals, and businesses Workforce-public health workforce will need to draw from a variety of skill sets to effectively address climate change prevention and preparedness Emergency Response-Health departments must develop the capacity to respond to more frequent and severe weather events and other adverse effects of climate change. This capacity must include planning, table-top exercises, drills, and simulations</p>
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	The heat wave in France in August 2003 caused 14,802 deaths in a 20-day period. A major heat wave in Athens in 1987 was associated with more than 2000 deaths.	<p>In 2008, the USGCRP identified some of the major climate change and health research gaps:</p> <ul style="list-style-type: none"> <li>• The ability to identify exposure thresholds for climate-sensitive health outcomes, such as heat stress, particularly for at-risk populations;</li> <li>• The development of modeling that looks at the health impacts of climate change and gives researchers estimates on the number of people affected by certain events;</li> <li>• Tools to monitor and evaluate current climate change preparedness measures, including the costs and benefits of interventions. Ex. effectiveness of heat warning systems/air quality alert programs</li> <li>• The development of modeling that gives state and local planners the ability to look at vulnerability at the micro level so they know which health effects they should be planning to respond to</li> <li>• Research on the built environment and community design, particularly on how to strengthen infrastructure to provide protection against extreme weather events, reduce the effect of urban heat-islands, and maintain drinking and wastewater standards amid rising sea levels and changing precipitation patterns</li> </ul>
CITATION	Kovats, R. S., and S. Hajat. 2008. "Heat stress and public health: A critical review." <i>Annu Rev Public Health</i> 29: 41–55	How Can We Prevent & Prepare for Health Issues in a Changing Climate? Trust for America's Health.
LINK	<a href="http://www.ncbi.nlm.nih.gov/pubmed/18031221">http://www.ncbi.nlm.nih.gov/pubmed/18031221</a>	<a href="http://healthyamericans.org/assets/files/ClimateChangeandHealth.pdf">http://healthyamericans.org/assets/files/ClimateChangeandHealth.pdf</a>

TITLE	Health Effects of Climate Change	Climate Change: Impacts, Vulnerabilities and Adaptation in developing countries (UNFCCC)	Addressing Human Vulnerability to Climate Change: Toward a 'No Regrets' Approach
TYPE OF RESOURCE	Research	Report	Research
SUMMARY OF KEY FINDINGS	The United Nations Intergovernmental Panel on Climate Change (IPCC) projects an increase of between 1.8°C and 5.8°C and an increase in sea levels between 9 and 88 cm during the next century.	A number of developing countries have developed adaptation plans or are in the process of finalizing them. This includes the National Adaptation Programmes of Action of least developed countries.	Vulnerable households tend to be highly exposed and sensitive to the direct and indirect risks associated with climate change, and because they lack access to formal and informal risk management arrangements. People that depend on agriculture (especially rainfed), livestock, and fisheries would be at risk. Within households, impacts will sometimes fall disproportionately on vulnerable individuals such as children, women, elderly, and disabled.
RACIAL/ETHNIC GROUP(S)	N/A	N/A	N/A
GEOGRAPHIC REGION	US, World	World	World
CLIMATE ISSUE(S)	Increases in temperature; Decreases in precipitation; Increases in precipitation, Increase in precipitation extremes; Sea-level rise; Air Pollution Concentration and Distribution; Pollen Production; Microbial Contamination and Transmission, Crop Yield, Coastal Flooding; Coastal Aquifer Salinity	Greenhouse gases, heat, salinization of drinking water (Sea-level rise in some areas may lead to a reduction in the salinity of hypersaline lagoons negatively affecting biodiversity)	Floods, Droughts, and Storms
MEASURE(S) OF VULNERABILITY	N/A	N/A	Children, women, elderly, and disabled. The most vulnerable households are those with assets and livelihoods exposed and sensitive to climatic risks and who have weak risk management capacity. People that depend on agriculture (especially rainfed), livestock, and fisheries would be at risk. In our definition, vulnerability depends on the characteristics of the risks; exposure and sensitivity to the risks; expected impacts and losses; and risk management capacity.
MEASURE(S) OF HEALTH OUTCOMES	1. Cardiovascular, cerebrovascular, and respiratory disease and is concentrated in elderly persons and individuals with preexisting illness. 2. Increases in psychiatric disorders, such as anxiety and depression. (Increases in suicide). 3. Malnutrition. 4. Infectious Diseases (Water and Food borne diseases) and (Vector and Rodent borne diseases), diarrheal diseases	Heat stress and changing patterns in the occurrence of disease vectors affecting health. Increased diarrheal and other infectious diseases	N/A
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	Mitigation refers to policies to reduce greenhouse gas emissions (eg, by promoting energy efficiency and the use of renewable energy sources such as solar and wind energy). This would especially apply to the United States, which produces more than 25% of global greenhouse emissions.  Mitigation Policies for Reduction of Greenhouse Gas Emissions: Energy Efficiency, Use of Renewable Energy Sources, Forest Preservation. Moderating Influences: Population Density and Growth, Level of Technological Development, Standard of Living and Local Environmental Condition, Preexisting Health Status, Quality and Access to Health Care, Public Health Infrastructure. Adaptation Measures: Vaccination Programs, Disease Surveillance Protective Technologies, Weather Forecasting and Warning Systems, Emergency Management and Disaster Preparedness, Public Health, Education and Prevention, Legislation and Administration	Sectoral adaptation measures look at actions for individual sectors that could be affected by climate change. Multi-sectoral adaptation options relate to the management of natural resources which span sectors. Cross-sectoral measures also span several sectors and can include: improvements to systematic observation and communication systems. It identifies the need for a forecasting and early warning system to provide seasonal forecasts for supporting agricultural production decisions and provide an early warning system and disaster management strategy for food security and emergency medicine to vulnerable communities in the case of extreme events. Adaptation to climate change must also occur through the prevention and removal of maladaptive practices. Maladaptation refers to adaptation measures that do not succeed in reducing vulnerability but increase it instead.	We also recommend four different areas of social science adaptation studies: 1. Monitoring change and responses 2. Predicting the consequences 3. Assessing policy alternatives 4. Institutional arrangements and financing  • Monitoring Household and Community Response to Climate Changes • Understanding Poverty and Distributional Implications of Climate Change • Assessing Alternative Adaptation Interventions • Institutional Arrangements and Financing of Adaptation
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	Climate change could increase the geographical distribution of vectors in parts of Latin America and in southwest Asia. Warming is likely to be greater at the poles than at the equator.	N/A	N/A
CITATION	Haines A, Patz JA: Health effects of climate change. JAMA 2004, 291:99-103.	Climate Change: Impacts, Vulnerabilities and Adaptation in Developing Countries. United Nations Framework Convention on Climate Change.	Heltberg, R., Siegel, P. B., Jorgensen, S. L. Addressing Human Vulnerability to Climate Change: Toward a 'No Regrets' Approach. Global Environmental Change, 2008.
LINK	<a href="http://jama.ama-assn.org/content/291/1/99.full.pdf+html">http://jama.ama-assn.org/content/291/1/99.full.pdf+html</a>	<a href="http://unfccc.int/resource/docs/publications/impacts.pdf">http://unfccc.int/resource/docs/publications/impacts.pdf</a>	<a href="http://siteresources.worldbank.org/EXTSOCIALPROTECTION/Resources/Climate_Change_and_SRM_FINAL.pdf?resourceurlname=Climate_Change_and_SRM_FINAL.pdf">http://siteresources.worldbank.org/EXTSOCIALPROTECTION/Resources/Climate_Change_and_SRM_FINAL.pdf?resourceurlname=Climate_Change_and_SRM_FINAL.pdf</a>

TITLE	Towards a Formal framework of vulnerability to climate change	A method for quantifying vulnerability, applied to the agricultural system of the Yaqui Valley, Mexico	A multidisciplinary multi-scale framework for assessing vulnerabilities to global change
TYPE OF RESOURCE	Research	Research	Research
SUMMARY OF KEY FINDINGS	The IPCC Third Assessment Report described vulnerability to climate change as "a function of the character, magnitude and rate of climate variation to which a system is exposed, its sensitivity and its adaptive capacity"	Propose measuring vulnerability of selected outcome variables of concern (e.g. agricultural yield) to identified stressors (e.g. climate change) as a function of the state of the variables of concern relative to a threshold of damage, the sensitivity of the variables to the stressors, and the magnitude and frequency of the stressors to which the system is exposed. In addition, we provide a framework for assessing the extent adaptive capacity can reduce vulnerable conditions. We illustrate the utility of this approach by evaluating the vulnerability of wheat yields to climate change and market fluctuations in the Yaqui Valley, Mexico	Describes a new approach to vulnerability assessment developed by the Advanced Terrestrial Ecosystem Analysis and Modelling (ATEAM) project. Most impact assessments do not quantify the vulnerability of ecosystems and ecosystem services under such environmental change. They cannot answer important policy-relevant questions such as 'Which are the main regions or sectors that are most vulnerable to global change?' 'How do the vulnerabilities of two regions compare?' 'Which scenario is the least harmful for a sector. Vulnerability is the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes.
RACIAL/ETHNIC GROUP(S)	N/A	N/A	N/A
GEOGRAPHIC REGION	World	Yaqui Valley, Mexico	N/A
CLIMATE ISSUE(S)	Floods, drought, tropical storms	Wheat yields to climate change and market fluctuations	Drought
MEASURE(S) OF VULNERABILITY	N/A	Yields are strongly determined by average night-time minimum temperatures during the growing season, which govern rates of plant respiration and development, where lower temperatures correlate with higher yields	Socioeconomic factors, land use, atmospheric composition, and climate
MEASURE(S) OF HEALTH OUTCOMES	N/A	Income, yield, health, ecosystem function	N/A
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	N/A	The most common method of quantifying vulnerability in the global change community is by using a set or composite of proxy indicators For example, USAID Food. Emergency Warning System (FEWS) program has used indices, calculated as averages or weighted averages of selected variables, to measure vulnerability to food insecurity in different regions throughout Africa	These vulnerability maps provide a means for making comparisons between ecosystem services, sectors, scenarios and regions to tackle questions such as: 1. Which regions are most vulnerable to global change? 2. How do the vulnerabilities of two regions compare? 3. Which sectors are the most vulnerable in a certain region? 4. Which scenario is the least harmful for a sector?
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	N/A	N/A	N/A
CITATION	C. Lonescu, R.J.T. Klein, J. Hinkel, K.S. Kavi Kumar and R. Klein, Towards a formal framework of vulnerability to climate change, Environmental Modeling and Assessment 14 (2009), pp. 1–16	Luers AL, Lobell DB, Sklar LS, Addams CL, Matson PA. A method for quantifying vulnerability, applied to the agricultural system of the Yaqui Valley, Mexico. Global Environmental Change. 2003;13:255–267.	Metzger, M.J., Leemans, R., Schroter, D. A multidisciplinary multi-scale framework for assessing vulnerabilities to global change, International Journal of Applied Earth Observation and Geoinformation. 2005;7:253-267
LINK	<a href="http://www.springerlink.com/content/p30qm3085471681t/">http://www.springerlink.com/content/p30qm3085471681t/</a>	<a href="http://pangea.stanford.edu/research/matsonlab/members/PDF/LuersMatson2003.pdf">http://pangea.stanford.edu/research/matsonlab/members/PDF/LuersMatson2003.pdf</a>	<a href="http://www.schroeter-patt.net/Metzger_JAG(7)253.pdf">http://www.schroeter-patt.net/Metzger_JAG(7)253.pdf</a>

TITLE	The surface of vulnerability: An analytical framework for examining environmental change	Conduct a climate change vulnerability assessment	Growing Old in a Changing Climate: Meeting the challenges of an aging population and climate change
TYPE OF RESOURCE	Research	Book Chapter	Report
SUMMARY OF KEY FINDINGS	This article proposes a three-dimensional surface of vulnerability as a tool for analyzing vulnerability. It introduces an analytical framework for evaluating the vulnerability of people and places to environmental and social forces. The framework represents the relative vulnerability of a variable of concern (e.g. such as agricultural yield) to a set of disturbing forces (e.g. climate change, market fluctuations) by a position on a three-dimensional analytical surface, where vulnerability is defined as a function of sensitivity, exposure, and the state relative to a threshold of damage.	Three-step process necessary to complete a vulnerability assessment for your planning areas: a sensitivity analysis for the systems associated with the planning areas, an evaluation of the adaptive capacity of the systems associated with each of the planning areas, and an assessment of how vulnerable the systems in your planning areas are to the effects of climate change	Climate change and an ageing population are crucial policy challenges which need to be addressed to ensure a safe, secure, equitable and sustainable future. Baby boomers have a higher carbon footprint compared to other age groups. Older people want to be part of the solution and to provide advice and guidance on what could be done to address climate change. Older people are especially vulnerable to some of the negative impacts of climate change
RACIAL/ETHNIC GROUP(S)	N/A	N/A	Elderly population
GEOGRAPHIC REGION	N/A	City of Olympia, Washington	UK
CLIMATE ISSUE(S)	Agricultural yield, soil and management factors	Floods	Heat waves, Air pollution, Cold related illnesses and deaths, Flooding, Infectious diseases, Vector borne diseases, Sunburn and skin cancer, Water and food shortages,
MEASURE(S) OF VULNERABILITY	Vulnerability assessments should take the outcome-based approach a step further by focusing on assessing the susceptibility of specific variables (e.g. food supply, income) of concern, which are believed to characterize the well being of a specific people or place, to a specific damage (e.g. hunger).	Degree of Sensitivity of Systems, Adaptive Capacity of Systems	Income, education, geographical location, access to social services and information, existing burden of disease, psychological well being
MEASURE(S) OF HEALTH OUTCOMES	N/A	N/A	Respiratory and cardiovascular diseases
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	N/A	Over the years, the City's climate change initiative was broadened into a commitment to sustainability. Since the early 1990s, the City has focused on climate change mitigation and other sustainability efforts, implementing policies to reduce greenhouse gas emissions and sustain natural resources. Internally, the City has reduced municipal vehicle emission, increased biodiesel usage, and moved towards utilizing 100% green power for all utility electricity needs. The City's water conservation and reclaimed water programs have mitigated the impact of increasing water demand; land use and transportation policies have promoted denser, less auto-dependent development; stormwater management, forest preservation and street tree planting have helped reduce the effects of urbanization; and the new waste management plan aims to move the City toward Zero Waste.	Recommendations: 1. Risk assess all future policies 2. Climate change proof the homes of older people in order to reduce CO2 emissions from the housing sector and tackle fuel poverty. (A programme of investment funded by national government is necessary so that every dwelling in England is retrofitted to the highest possible standard). 3. A major programme of local accessibility enrichment and modal shift taking into account best practice on walking, cycling, public transport and land use planning. Strategic Health Authorities and local authorities have a key role to play in developing integrated and preventative measures to ensure older people enjoy healthy and active aging 4. Better transport for older people. Older people have suffered from the trend toward out-of-town shopping centres that are accessible only by car, and from the withdrawal of so many bus services across the country. By 2015, standards of modal share and public transport efficiency, reliability, interchange potential, safety and security should be equal to best practice in the European Union. 5. Leadership driven by central government is required to address the challenge of growing old in a changing climate and to ensure a safe, secure, equitable and sustainable future for older people. This leadership should establish an Older People and Climate Change Group that brings together older people's organizations, key stakeholders, the voluntary sector, government agencies and academia. This group should initially be charged with developing a national policy framework that sets out cross sectoral interventions and policies to improve the quality of life of older people.
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	N/A	The City of Olympia is located at the south end of Puget Sound in a region that is considered vulnerable to sea level rise because of its low elevation, the intensity of development along its shoreline, and tectonic processes that appear to be causing land elevations in the south Puget Sound region to be sinking	N/A
CITATION	Luers, AL. The surface of vulnerability: An analytical framework for examining environmental change. Global Environmental Change. 2005;15:214-223.	Conduct a Climate Resiliency Study. "Conduct a Climate Change Vulnerability Assessment". Milestone.	Haq, G., Whitelegg, J., Kohler, M. Growing Old in a Changing Climate: Meeting the challenges of an ageing population and climate change. Stockholm Environment Institute (SEI). 2008
LINK	<a href="http://yaquivalley.stanford.edu/pdf/LuersGEC20051.pdf">http://yaquivalley.stanford.edu/pdf/LuersGEC20051.pdf</a>	<a href="http://cses.washington.edu/db/pdf/snoveretalgb574ch8.pdf">http://cses.washington.edu/db/pdf/snoveretalgb574ch8.pdf</a>	<a href="http://sei-international.org/mediamanager/documents/Publications/Future/climate_change_growing_old.pdf">http://sei-international.org/mediamanager/documents/Publications/Future/climate_change_growing_old.pdf</a>



TITLE	Indigenous and Traditional Peoples and Climate Change	Vulnerability: A generally applicable conceptual framework for climate change research	The Faces of Climate Change Adaptation: The Need for Proactive Protection of the Nation's Coasts
TYPE OF RESOURCE	Report	Research	Report
SUMMARY OF KEY FINDINGS	<p>The IPCC (2007b) defines the concept of vulnerability as the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and variation to which a system is exposed, its sensitivity, and its adaptive capacity.</p> <p>Vulnerability of traditional and indigenous peoples to global environmental change is mainly determined by the low degree of social and biophysical security driving from poverty and marginalization.</p>	<p>This paper presents a generally applicable conceptual framework of vulnerability that Combines a nomenclature of vulnerable situations and a terminology of vulnerability concepts based on the distinction of four fundamental groups of vulnerability factors. This conceptual framework is applied to characterize the vulnerability concepts employed by the main schools of vulnerability research and to review earlier attempts at classifying vulnerability concepts.</p>	<p>Florida-facing sea level rise, coastal erosion, and increased storm intensity and frequency. A state whose highest point is only 345ft above sea level, a 35-55 inch seal level rise by 2100 would result in an annual property and revenue loss of up to \$345 billion</p> <p>Texas- In the coastal city of Galveston, sea level is already rising by 25 inches per century, and it is likely to rise another 38 inches by 2100.</p> <p>Ohio- The Great Lakes are also experiencing the effects of climate change: increased flooding, lake level changes, and loss of wetlands. In addition to lower lake levels, the Great Lakes region will also see increased flooding as a result of precipitation change.</p>
RACIAL/ETHNIC GROUP(S)	N/A	N/A	N/A
GEOGRAPHIC REGION	N/A	N/A	Florida, Texas, Ohio, Maryland, Massachusetts, California
CLIMATE ISSUE(S)	Oceans, Coastal areas and islands and climate change, tropical forest belt and climate change, dry lands, watersheds	Drought, hurricane	Sea level rise and lake level changes, shoreline erosion, increased storm frequency or intensity, changes in rainfall, flooding
MEASURE(S) OF VULNERABILITY	<ol style="list-style-type: none"> <li>1. Social vulnerability factors: Poverty and inequality, Health and nutrition, Social networks</li> <li>2. Biophysical vulnerability factors: Exposure to extreme events, Availability of natural resources, Location of residence, Housing quality</li> </ol>	States low elevation makes it highly susceptible to sea-level rise	N/A
MEASURE(S) OF HEALTH OUTCOMES	Increased exposure to Ultra Violet Radiation (UVR), malnutrition, deaths caused by heat waves, droughts, floods and storms, infectious vector-borne diseases causing increased incidences of diarrhea and respiratory diseases	N/A	N/A
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	<p>Some countries and regions are in the process of developing adaptation procedures and risk management practices in the water sector (e.g. Caribbean, Canada, Australia, Netherlands, UK, USA, Germany). Specific steps are proposed:</p> <ol style="list-style-type: none"> <li>1. Help inform and empower indigenous peoples to address climate change issues</li> <li>2. Identify indigenous forest dwelling groups who are particularly susceptible to climate change threats.</li> <li>3. Take measures to ensure that the interests of indigenous forest peoples are properly addressed in any negotiations on large scale carbon sequestration projects, biofuel projects or avoided deforestation projects.</li> </ol>	The risk hazard approach is most appropriate to inform mitigation and compensation policy whereas the political economy approach is better suited to informat the design of adaptation policies	<p>Maryland- is one of the most progressive states in adapting to climate change. In August of 2008, Maryland released its Climate Action Plan, detailing the steps necessary for Maryland to adequately cope with its changing climate. As part of the Climate Action Plan, the Commission's Adaptation and Response Working Group. (ARWG) developed a Comprehensive Strategy for Reducing Maryland's Vulnerability to Climate Change, Chapter 5 of the Climate Action Plan. This strategy aimed to: promote programs and policies aimed at the avoidance and/or reduction of impact to the existing built environment, as well as to future growth and development in vulnerable coastal areas; enhance preparedness and planning efforts to protect human health, safety and welfare. The Maryland Climate Action Plan also examined the importance of mitigation in a climate policy. Maryland has already taken a proactive approach, instituting the Healthy Air Act, The Clean Cars Act, EmPower Maryland Program, and the Commission on Climate Change. Massachusetts-Governor Patrick signed the Global Warming Solutions Act which affirms the Commonwealth's leadership in clean energy and environmental stewardship by requiring reductions in GHG emissions from 1990 levels by 80 % by 2050 and up t o 25 % by 2020. The Massachusetts StormSmart Coasts program offers a comprehensive website designed to help different agencies and stakeholders gather valuable information on adapting coastal areas to climate change. StormSmart Coasts also seeks to educate the community about the impacts of climate change. StormSmart Coasts directs readers to specialized (and often free) training for local officials, and general printed information for citizens</p>
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	Recent studies indicate that the greatest risk of increasing temperatures and decreasing precipitation is an increased intensity of forest fires	N/A	Florida and Texas have seen an increase in storm frequency and intensity which in turn, has caused increased erosion in coastal areas
CITATION	Macchi, M., Oviedo, G., Gotheil, S. Cross, K., Boedihartono, A., Wolfangel, C. and Howell, M. (2008). Indigenous and Traditional Peoples and Climate Change. (International Union for Conservation of Nature Issues Paper).	Fussel, H.M., Vulnerability is a function of exposure to climate factors, sensitivity to change and capacity to adapt to that change, Global Environmental Change. 17(2007):155-167.	Wyman, J., Carter, D., Weber, J., et al. The Faces of Climate Change Adaptation: The Need for Proactive Protection of the Nation's Coasts. Coastal States Organization's Climate Change Work Group, 2010.
LINK	<a href="http://cmsdata.iucn.org/downloads/indigenous_peoples_climate_change.pdf">http://cmsdata.iucn.org/downloads/indigenous_peoples_climate_change.pdf</a>	<a href="http://www.pik-potsdam.de/~fuessel/download/gec05_published.pdf">http://www.pik-potsdam.de/~fuessel/download/gec05_published.pdf</a>	<a href="http://coastalstates.org.seedevelopmentprogress.com/wp-content/uploads/2010/07/CSO-White-Paper-on-Climate-Change-Adaptation-May-2010.pdf">http://coastalstates.org.seedevelopmentprogress.com/wp-content/uploads/2010/07/CSO-White-Paper-on-Climate-Change-Adaptation-May-2010.pdf</a>

TITLE	Chicago Climate Action Plan Natural Environment Adaptation Working Group Guiding Document: Overview, Priorities, Accomplishments	Vulnerability Assessment, Climate Change Impacts, and Adaptation Measures	Climate Change, Vulnerability and Health Effects: Implications for the Older Population
TYPE OF RESOURCE	Report	Book Chapter	Research
SUMMARY OF KEY FINDINGS	In the last 50 years, levels of carbon dioxide in the atmosphere have risen 25 percent; levels of methane, an even more potent greenhouse gas, have more than doubled. Because of these increases in heat-trapping gases, under a high-emissions scenario, 2010 predictions show that by the end of the century, Chicago's annual average temperature could increase from the current average of 50° to 59° °F.	This paper reviews the historical development of the conceptual ideas underpinning assessments of vulnerability to climate change. Climate impact assessments, first- and second-generation vulnerability assessments, and adaptation policy assessments are distinguished. Mitigation has traditionally received much greater attention than adaptation in the climate change community, both from a scientific and from a policy perspective. Important reasons for the focus on mitigation are, first of all, that mitigating climate change helps to reduce impacts on all climate sensitive systems, whereas the potential of adaptation measures is limited for many systems.	About 20 % of older people reside in a county where a hurricane or large tropical storm is likely to make landfall over a ten-year period. These data also suggest that there is a higher concentration of low-income older people in the vulnerable counties. These data also suggest that there is a higher concentration of low-income older people in the vulnerable counties. The older population is at greater risk for adverse health effects from increased heating and cooling, susceptibility to disease, stresses on the food and water supply, and reduced ability to mobilize quickly
RACIAL/ETHNIC GROUP(S)	N/A	N/A	Older population
GEOGRAPHIC REGION	Chicago	N/A	N/A
CLIMATE ISSUE(S)	Migrating seasons, Temperature increase Heat-related morbidity, Changed precipitation patterns, Great Lake impacts, Plant Hardiness Zone shift	West. Floods, water quality problems, increase in temperature, air and water pollution	Heat waves, air pollution, flooding, food and water shortage, vector-borne diseases, increased sunlight, drought,
MEASURE(S) OF VULNERABILITY	N/A	N/A	Social economic factors (social exclusion). Those who are poorer, less educated, less connected to transportation, and less geographically mobile will be at risk of for negative outcomes in natural disasters
MEASURE(S) OF HEALTH OUTCOMES	N/A	Heat stress, waterborne and food borne diseases, poor air quality, extreme weather events, and diseases transmitted by insects and rodents	Cardiovascular disease, diabetes, and conditions such as Alzheimer's
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	1. Promote consideration of natural environment climate change adaptation within existing actions and initiatives. 2. Raise awareness among different audiences about why and how to help the natural environment adapt to climate change. 3. Help stakeholders understand climate change impacts and the latest science. 4. Leverage existing plans and partnerships to achieve goals. Many existing plans are being implemented to improve the health of ecosystems and their resiliency in the face of climate change. 5. Track progress toward reducing vulnerability of ecosystems to climate change	EPA's Global Change Research Program (GCRP) is an assessment-oriented program that emphasizes understanding the potential consequences of climate variability and change on U.S. human health, ecosystems, and socioeconomic systems. This program has four areas of emphasis: human health, air quality, water quality, and ecosystem health. In addition, the Cool Homes program offers assistance to elderly, low-income residents to install roof insulation and cool surfaces to save energy and lower indoor temperatures. Philadelphia's system is estimated to have saved 117 lives in its first three years of operation	Research on the effect of heat waves on older people suggests that interventions to mitigate the impact of changing climate on older people should target older adults with multiple risk factors (health conditions, small social networks, lower socioeconomic status).
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	The Great Lakes could experience an increased likelihood of extreme storms.	Under constant pollution emissions, by the middle of this century, Red Ozone Alert days (when the air is unhealthy for everyone) in the 50 largest cities in the eastern United States, are projected to increase by 68% due to warming alone.	Exposure to neurotoxins and pollution is greater among those of lower socioeconomic status
CITATION	Natural Environment Adaptation Working Group Guiding Document. 2011.	Vulnerability Assessment, Climate Change Impacts, and Adaptation Measures. U.S. Climate Action Report 2010.	Filiberto D., Wells N., Wethington E., Pillemer K., Wysocki M. Climate Change, Vulnerability and Health Effects: Implications for the Older Population
LINK	<a href="http://www.cityofchicago.org/content/dam/city/depts/doe/general/NaturalResourcesAndWaterConservation_PDFs/Adaptation/CCAPNaturalEnvironmentAdaptationGuidingDocument.pdf">http://www.cityofchicago.org/content/dam/city/depts/doe/general/NaturalResourcesAndWaterConservation_PDFs/Adaptation/CCAPNaturalEnvironmentAdaptationGuidingDocument.pdf</a>	<a href="http://www.state.gov/documents/organization/140006.pdf">http://www.state.gov/documents/organization/140006.pdf</a>	<a href="http://www.neopanora.com/en/component/content/article/87-climate-change/121-climate-change-vulnerability-and-health-effects-implications-for-the-older-population.html">http://www.neopanora.com/en/component/content/article/87-climate-change/121-climate-change-vulnerability-and-health-effects-implications-for-the-older-population.html</a>

TITLE	Adaptation to Climate Change in the Houston-Galveston Area: Perceptions and Prospects	RACE, ETHNICITY and Public Responses to Climate Change	Introduction: Building the Case for Pro- Poor Adaptation
TYPE OF RESOURCE	Research	Report	Report
SUMMARY OF KEY FINDINGS	<p>The overall trend for the state shows that temperatures are rising; the H-GAC region has experienced a warming trend observed from 1901 to 2000 of 0.4 – 0.9°F. These models show that without drastic human intervention to decrease temperatures, the state could expect a 0.56°C rise by 2010, 1.12°C by 2030, and 1.94°C increase by 2050 – only 40 years from now.</p> <p>Climatologists suggest that while overall precipitation for the state will decrease, certain areas of Texas will see increased rainfall. North suggests that west Texas will become more arid and that east Texas will experience more precipitation.</p> <p>Within the next 50 to 100 years the Texas coast is expected to experience a rise of 0.6 to 1.9 feet.</p>	<p>In this report we examine American public support for climate change and energy policies among different racial and ethnic groups. Hispanics, African Americans and people of “Other” races and ethnicities were often the strongest supporters of policies to reduce greenhouse gas emissions, even when informed that some of these policies would entail individual costs</p>	<p>At the same time, there is a growing acknowledgement of the need to enable human and natural systems to adjust to actual or expected climate stimuli or their effects – a process known as ‘adaptation’. After playing an initially secondary role, adaptation has now become a central strand of national and international climate policy</p>
RACIAL/ETHNIC GROUP(S)	N/A	Hispanics, African Americans	N/A
GEOGRAPHIC REGION	Texas	US	N/A
CLIMATE ISSUE(S)	Hurricanes, floods, increase in temperature, drought, rising sea level, precipitation	Heat waves, famines and food shortages, droughts and water shortages, intense rainstorms and hurricanes, forest fires, disease,	Greenhouse gases
MEASURE(S) OF VULNERABILITY	Household Income, % Unemployed, % below poverty level, % with no HS diploma	N/A	Health, education, poverty
MEASURE(S) OF HEALTH OUTCOMES	Increasing burden from malnutrition, diarrheal, cardio-respiratory, and infectious diseases. Increased morbidity and mortality from heat waves, floods and drought.	N/A	N/A
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	<ol style="list-style-type: none"> <li>1. Remarket how climate change is perceived; focus on security and public safety</li> <li>2. Focus on constituent education</li> <li>3. Promote a regional viewpoint on climate change</li> <li>4. Highlight academia as a source of adaptation knowledge</li> <li>5. Offer workshops and other support opportunities to involve and educate stakeholders</li> <li>6. Work with other organizations to support funding adaptation at the federal level</li> </ol>	<p>Hispanics, African Americans and people of other races and ethnicities were often the strongest supporters of climate and energy policies and were also more likely to support these policies even if they incurred greater costs</p>	<p>Davies et al. explore parallels between the communities of practice around disaster risk reduction, social protection and adaptation to investigate how mechanisms and instruments can deliver ‘adaptive social protection’. It draws on examples in agriculture to ask how social protection can be made resilient in the face of climate change while targeting poor and vulnerable people. The article calls for social protection measures with longer timeframes that can tackle structural vulnerability to provide adaptation by transforming rather than protecting livelihoods and coping mechanisms.</p>
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	N/A	N/A	N/A
CITATION	Adaptation to Climate Change in the Houston-Galveston Area: Perceptions and Prospects. The Bush School of Government and Public Service 2009.	Leiserowitz, A. & Akerlof, K. (2010) Race, Ethnicity and Public Responses to Climate Change. Yale University and George Mason University. New Haven, CT: Yale Project on Climate Change.	Tanner, T., Mitchell, T. Introduction: Building the Case for Pro-Poor Adaptation. Institute of Development Studies. 2008;39:4.
LINK	<a href="http://bush.tamu.edu/research/capstones/mpsa/projects/2009/AdaptionToClimateChange.pdf">http://bush.tamu.edu/research/capstones/mpsa/projects/2009/AdaptionToClimateChange.pdf</a>	<a href="http://environment.yale.edu/climate/files/Race_Ethnicity_and_Climate_Change_2.pdf">http://environment.yale.edu/climate/files/Race_Ethnicity_and_Climate_Change_2.pdf</a>	<a href="http://www.ids.ac.uk/files/dmfile/0TannerIntro39.4update.pdf">http://www.ids.ac.uk/files/dmfile/0TannerIntro39.4update.pdf</a>

TITLE	Understanding Climate Change: An Equitable Framework	Managing the health effects of climate change
TYPE OF RESOURCE	Report	N/A
SUMMARY OF KEY FINDINGS	<p>The 22 hottest years in recorded human history have occurred since 1980. The earth's surface temperature has increased by about 1.4°F during the last century. Global warming is increasing at an alarmingly fast clip, and global average temperatures are estimated to rise some 3.24°F to 7.2°F over the next century. According to one scientist, a rise of just 2.1°F will expose between 2.3 and 3 billion people to the risk of water shortages</p>	<p>Recent observations confirm that the worst-case IPCC scenario trajectories are being realized for parameters such as global mean surface temperature, sea level rise, ocean and ice-sheet dynamics, ocean acidification, and extreme climatic events. Many parameters might worsen, leading to an increasing risk of abrupt or irreversible climatic shifts.</p> <p>Societies are highly vulnerable to even modest climate change, with poor nations and communities especially at risk. Temperature rises above 2°C will be challenging for contemporary societies to cope with and will increase the level of climate disruption through the rest of the century.</p> <p>Rapid, sustained, and effective mitigation based on coordinated global and regional action is required to avoid dangerous climate change, regardless of how it is defined. Delay in initiating effective mitigation actions increases greatly the long-term social and economic costs of both adaptation and mitigation.</p> <p>Climate change is having, and will have, very different effects on people within and between countries and regions, on present and future generations, and on human societies and nature.</p>
RACIAL/ETHNIC GROUP(S)	Native American, African American	N/A
GEOGRAPHIC REGION	US (Chicago, Southeast and Mid-Atlantic coasts)	Europe; World
CLIMATE ISSUE(S)	Heat wave, rising sea level, drought, decreased food security, Air pollution	Food and water shortages, droughts, floods, air pollution, heat waves, cold waves, windstorms, sea level rise,
MEASURE(S) OF VULNERABILITY	Low income, access to public transit,	Income
MEASURE(S) OF HEALTH OUTCOMES	<p>Pollen levels cause strong allergic reactions. Hotter temperatures and increased rainfall are likely to increase the populations of insects and animals that are carriers of human diseases.</p> <p>West Nile virus, Lyme disease, malaria, dengue fever, yellow fever, and encephalitis could spread farther and faster. Poor water quality can lead to gastrointestinal illness.</p> <p>Increased wildfire incidents would release high levels of air pollutants that decrease lung function</p>	<p>We consider six ways that link climate change to health. These are changing patterns of disease and mortality, extreme events, food, water, shelter, and population. Malnutrition due to food shortages, respiratory and cardiovascular causes, increasing the short-term mortality rate due to heatstroke, Vector reproduction, parasite development cycle, and bite frequency generally rise with temperature; therefore, malaria, tick-borne encephalitis, and dengue fever will become increasingly widespread.</p> <p>Heavy rainfall and a rise in temperature increase the rate of infection. By 2080, about 6 billion people will be at risk of contracting dengue fever as a consequence of climate change, compared with 3-5 billion people if the climate remained unchanged.</p>
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	<p>An important step forward for governmental work on climate change can be found in the formation of ICLEI, Local Governments for Sustainability. Nearly 300 mayors in the United States, representing more than 49 million Americans, have agreed to meet or surpass the targets for GHG emissions set by the Kyoto Protocol. All of the member cities make a pledge to follow ICLEI's methodology for addressing climate, including conducting greenhouse gas emissions inventory and developing reduction targets.</p> <p>The California Public Utilities Commission is implementing a \$108 million program providing incentives for installing solar panels to low income, single family homes. The City of Berkeley has tried to address this dynamic by providing upfront grants to homeowners to do solar retrofitting and to amortize repayment over 30 years through property taxes. This allows lower-income families to pay back expenses while realizing energy savings</p>	<p>Climate change mitigation and adaptation are essential elements to overall development policy. They are not separate issues that can be divided from the agenda for poverty alleviation or for closing the gap on social inequalities and health. The most urgent need is to empower poor countries, and local government and local communities everywhere, to understand climate implications and to take action. Health professionals and university academics have an important catalytic role.</p> <p>Multidisciplinary groups from higher education institutions can have a forceful role in engaging with community leaders, civil society organizations, and students these debates..</p> <p>Climate change should be integrated into the entire discourse of our present and should be taken into consideration for all governance actions. An advocacy movement must ensure that the health effects of climate change are placed high on the agenda of every research and development funder, philanthropist, academic journal, scientific conference, professional meeting, and university or school curriculum. Awareness of health risks can have an important role in strengthening carbon mitigation debates and targets</p>
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	Already, 80% of Atlantic beaches are eroding, affecting the tourism industry and homes in those areas.	N/A
CITATION	Lin, SW. Understanding Climate Change An Equitable Framework. PolicyLink, 2008.	Costello, A., Abbas, M., Allen, A., Ball, S., Bell, S., Bellamy, R., et al. Managing the health effects of climate change. Lancet and University College London Institute for Global Health Commission. 2009;373:1693-1733.
LINK	<a href="http://www.policyarchive.org/handle/10207/bitstreams/11782.pdf">http://www.policyarchive.org/handle/10207/bitstreams/11782.pdf</a>	<a href="http://www.abuhrc.org/Documents/Lancet%20Climate%20Change.pdf">http://www.abuhrc.org/Documents/Lancet%20Climate%20Change.pdf</a>

TITLE	House Majority Whip: Climate Change Hurts Blacks More: Clyburn says African Americans disproportionately impacted	U.S. blacks face harsher climate change impact	Global warming more harmful to low-income minorities
TYPE OF RESOURCE	Online Article	Online Article	Report
SUMMARY OF KEY FINDINGS	<p>Though far less responsible for climate change, African-Americans are significantly more vulnerable to its effects than non-Hispanic whites. Health, housing, economic well-being, culture, and social stability are harmed from such manifestations of climate change as storms, floods, and climate variability.</p> <p>African-Americans are also more vulnerable to higher energy bills, unemployment, recessions caused by global energy price shocks, and a greater economic burden from military operations designed to protect the flow of oil to the U.S</p>	Blacks are more than twice as likely as whites to live in cities where the so-called heat island effect is expected to make temperature increases more severe. In a survey of 750 U.S. black adults, 81% said the U.S. government should take strong action to deal with global warming,	<p>Heat-related deaths among blacks occur at a 150 to 200% greater rate than for non-Hispanic whites.</p> <p>Asthma, which has a strong correlation to air pollution, affects blacks at a 36 % higher rate of incidence than whites.</p>
RACIAL/ETHNIC GROUP(S)	African Americans	African Americans	Africans Americans
GEOGRAPHIC REGION	US	US	US (Mississippi, Louisiana, Georgia, Maryland, South Carolina and Alabama)
CLIMATE ISSUE(S)	Storm, floods, hurricane	N/A	Air pollution, rising temperatures, storms, floods
MEASURE(S) OF VULNERABILITY	N/A	More blacks also will be "fuel poor" as energy demand rises due to higher air-conditioning loads	Low-income, unemployment rates
MEASURE(S) OF HEALTH OUTCOMES	N/A	N/A	Asthma
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	The report suggested implementing a "fee, tax or allowance auction on polluters," which was meant to "eliminate the financial burden on low-income and moderate-income households. This would pay for efforts to reduce global warming. The revenue from the "fee, tax, or allowance auction payment" would be redistributed to consumers to offset the higher costs.	N/A	Report recommended imposing a fee, tax or allowance auction on polluters that would finance efforts to reduce global warming and would eliminate the financial burden on low-income and moderate-income households. It also proposed investing in energy efficiency and using polluter fees to invest in public utilities, such as schools
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	N/A	N/A	Mississippi, Louisiana, Georgia, Maryland, South Carolina and Alabama are in the Atlantic hurricane zone and are expected to be hit with more intense storms, similar to the caliber of hurricanes Katrina and Rita. Those states also have the largest populations of black residents
CITATION	Poor, J., House Majority Whip: Climate Change Hurts Blacks More. Business and Media Institute, Jul 29, 2008.	Zabarenko, D. U.S. blacks face harsher climate change impact. Reuters. Jul 29, 2008.	Radick, L. Global warming more harmful to low-income minorities. Medill Reports, Washington. Jul 24, 2008.
LINK	<a href="http://www.mrc.org/bmi/articles/2008/House_Majority_Whip_Climate_Change_Hurts_Blacks_More.html">http://www.mrc.org/bmi/articles/2008/House_Majority_Whip_Climate_Change_Hurts_Blacks_More.html</a>	<a href="http://www.reuters.com/article/2008/07/29/us-climate-usa-blacks-idUSN2933881420080729?feedType=RSS&amp;feedName=environmentNews">http://www.reuters.com/article/2008/07/29/us-climate-usa-blacks-idUSN2933881420080729?feedType=RSS&amp;feedName=environmentNews</a>	<a href="http://news.medill.northwestern.edu/washington/news.aspx?id=95563&amp;print=1">http://news.medill.northwestern.edu/washington/news.aspx?id=95563&amp;print=1</a>

TITLE	Joint Center Forms Partnership to Bring More African American Voices Into Climate Change Debate	Adapt or Die	Who Will Be Hit Hardest by Climate Change
TYPE OF RESOURCE	Report	Online Article	Report
SUMMARY OF KEY FINDINGS	The Joint Center for Political and Economic Studies (Joint Center) is launching an effort to engage the African American community on the issue of climate change. The move is being funded by the Bipartisan Policy Center which is providing the Joint Center with a \$500,000 grant to expand its capacity to conduct climate change research and outreach. Black communities are likely to be disproportionately affected by the health effects of climate change -- particularly those related to extreme weather events like Hurricane Katrina and further degradation of air quality. They are also more likely to be harmed by rising energy prices.	illustrates the terrible injustice at the heart of the crisis: Global warming was caused by the rich world's greenhouse gas emissions over the past two centuries, but it tends to punish the poor of today first and worst. This historical reality has given rise to calls for what amount to climate change reparations  Is it really possible to protect New Orleans, much of which lies below sea level, from the one- to three-foot rise in sea level that, according to scientists, global warming will likely cause	Minorities represent 85 percent of the agriculture work force, and of that, 77 percent are Latino.  African-Americans produce 20% less greenhouse gases; Latinos produce 40% less per capita than any other group. But comparing the same income brackets shows African-American and Latino households consume more energy and in different ways.  Latinos spend more energy on gas than the non-Latino white population, which may be due to the types of jobs and commutes people have in these communities.  The structures African-Americans live in consume more energy, mainly for heating and cooling. This trend may be because a greater proportion of blacks are renters. The U.S. Census shows 54% of African-Americans are renters, versus 32% of the population as a whole
RACIAL/ETHNIC GROUP(S)	African Americans	N/A	Latino, African Americans
GEOGRAPHIC REGION	US	New Orleans/Bangladesh	California
CLIMATE ISSUE(S)	Air quality, hurricanes	Strong hurricanes, floods, fiercer heat waves, harsher droughts, heavier rains and inexorable sea level rise	Temperature rise, water shortages
MEASURE(S) OF VULNERABILITY	N/A	Poverty	Income
MEASURE(S) OF HEALTH OUTCOMES	N/A	N/A	N/A
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	The BPC -- led by four former U.S. Senate Majority Leaders (Howard Baker, Tom Daschle, Bob Dole and George Mitchell) -- was formed to develop and promote solutions that would attract the public support and political momentum to achieve real progress. The BPC acts as an incubator for policy efforts that engage top political figures, advocates, academics and business leaders in the art of principled compromise. In addition to advancing specific proposals, the BPC also is broadcasting a different type of policy discourse that seeks to unite the constructive center in the pursuit of common goals. Working with its National Commission on Energy Policy, the BPC is working to engage new voices in the climate change policy debate	The principle of climate change reparations is already part of international law, at least in theory. Rich countries that have ratified the 1992 UN Framework Convention on Climate Change—a group that includes the United States, though it shuns the convention's 1997 Kyoto Protocol—are legally obliged to fund adaptation efforts in vulnerable developing countries.	Policies should target specific needs such as programs that help low-income people move toward energy-efficient cars or give incentives for landlords to exchange old appliances for energy-efficient ones.
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	N/A	New Orleans, like Bangladesh, will be looked back on as one of the first great casualties of climate change	N/A
CITATION	Joint Center Forms Partnership to Bring More African American Voices Into Climate Change Debate. PR Newswire.	Hertsgaard, M. "Adapt or Die." Open Society Foundations. 2007.	Johnson, J. Who Will Be Hit Hardest by Climate Change? IMDiversity. Jul 19, 2006.
LINK	<a href="http://www2.prnewswire.com/cgi-bin/stories.pl?ACCT=109&amp;STORY=/www/story/09-28-2007/0004672180&amp;EDATE">http://www2.prnewswire.com/cgi-bin/stories.pl?ACCT=109&amp;STORY=/www/story/09-28-2007/0004672180&amp;EDATE</a>	<a href="http://www.soros.org/resources/multimedia/katrina/projects/ThroughStorm/story_AdaptDie.php">http://www.soros.org/resources/multimedia/katrina/projects/ThroughStorm/story_AdaptDie.php</a>	<a href="http://www.imdiversity.com/Villages/Careers/news/pns_minorities_weather_0706.asp">http://www.imdiversity.com/Villages/Careers/news/pns_minorities_weather_0706.asp</a>

TITLE	Africans, African-Americans and Climate Impacts: Top-down vs. bottom-up approach to capacity building	Black Americans and Global Warming: An Unequal Burden	The epidemiology of heat-related deaths
TYPE OF RESOURCE	Report	Report	Research
SUMMARY OF KEY FINDINGS	African Americans are suffering disproportionately from the impacts of today's climate variability and extreme events, such as Hurricane Katrina's impacts in New Orleans in 2005 and Hurricane Floyd's impacts in North Carolina in 1999. To be sure, all poor people along with people in other socio-economic strata in these areas, regardless of race, were adversely affected by these events. However, the African-American communities have been the worst affected with regard to adverse impacts (deaths) and in the economic recovery process as well, when compared with other nearby communities and socioeconomic groups	Whites to be exposed to higher air toxics concentrations. African Americans are nearly three times as likely to be hospitalized or killed by asthma as whites, with climate change expected to increase the incidence of asthma in the general population. All of these problems are compounded by the fact that Blacks are 50% more likely than non Blacks to be uninsured. African American households emit 20% less carbon dioxide than white households. African Americans are more than twice as likely to live in poverty: the group most impacted by energy prices. Increases in the price of energy will negatively affect African Americans more significantly than the general population.	A study of the deaths during a 1980 heat wave in Texas revealed death rates that were highest in males, the elderly, Blacks and those engaged in heavy labor, the latter two factors perhaps reflecting socioeconomic status. The data suggest that persistent high temperatures were related to death to a greater degree than the temperature peaks reached. Higher heat death rates in earlier years are believed to be attributable to the limited availability of air conditioning in those years.  Populations at particular risk are those of low socioeconomic status, those engaged in heavy physical labor, and the aged. Low socioeconomic status limits the availability of air conditioning and the aged are more likely to have one or more chronic diseases
RACIAL/ETHNIC GROUP(S)	African Americans	African Americans	African Americans
GEOGRAPHIC REGION	U.S.	US	Texas
CLIMATE ISSUE(S)	Heat wave, flooding, hurricane	Air pollution, heat wave, drought, flooding	Heat wave
MEASURE(S) OF VULNERABILITY	N/A	N/A	Socioeconomic status, limited availability of air conditioning
MEASURE(S) OF HEALTH OUTCOMES	N/A	Increase in infectious diseases, such as malaria and dengue fever, primarily in Southern states	Death
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	Another recent expression of interest in climate's impacts on the minorities focused specifically on the United States . The U.S. Congressional Black Caucus, a group that includes all African-American members of the U.S. Congress, commissioned a report that focused on the potential impacts of global warming on African Americans. The report (entitled "Black Americans and Global Warming: An Unequal Burden") was released to the public in July 2004. The report supported Bullard's (among others') contention that minorities (in America , African Americans specifically) are most likely to suffer disproportionately as a result of the foreseeable impacts of climate change (for example, flooding, heat waves and high energy prices).	African Americans will be directly affected by climate policies in three basic ways: 1. Reduced Pollution 2. Energy Prices 3. Fossil Fuel Dependence  Policies specifically considered in this report include many outlined in current and proposed energy legislation, including: • Appliance efficiency standards, • Exploration of the Arctic National Wildlife Refuge, • CAFÉ standards, • Ethanol promotion, • An array of fossil fuel tax incentives, • Several hydrogen energy initiatives, • LIHEAP and Weatherization Assistance, • Modifications to New Source Review, • Nuclear energy promotion (in S.2095) • Various incentives for renewable energy (e.g. S.2095), • Renewable portfolios, • The Climate Stewardship Act (S.139), • Multi-Pollutant Power Plant Legislation (e.g. S. 366, S. 485, H.R. 999, S. 843	N/A
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	N/A	Future heat waves will be most lethal in the inner cities of the northern half of the country, such as New York City, Detroit, Chicago, and Philadelphia, where many African American communities are located.	N/A
CITATION	Glantz MH., Africans, African-Americans and Climate Impacts: Top-down vs. Bottom-up Approach to Capacity Building. Fragileecologies. Jul 7,2006.	African Americans and Climate Change: An unequal burden. Congressional Black Caucus Foundation, Inc. Jul 21, 2004.	Greenberg JH, Bromberg J, Reed CM, Gustafson TL, Beauchamp RA, The Epidemiology of Heat- Related Deaths, Texas-1950, 1970 79, and 1980, AJPH. 1983 July; 73(7): 805-807
LINK	<a href="http://www.fragileecologies.com/jul07_06.html">http://www.fragileecologies.com/jul07_06.html</a>	<a href="http://www.cbcfinc.org/images/pdf/AAClim_chg_final.pdf">http://www.cbcfinc.org/images/pdf/AAClim_chg_final.pdf</a>	<a href="http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1650898/?page=1">http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1650898/?page=1</a>

TITLE	Heat Wave: A Social Autopsy of Disaster in Chicago	Mortality in Chicago attributed to the July 1995 heat wave	New Jersey: Confronting Climate Change in the US Northeast
TYPE OF RESOURCE	Book	Research	Report
SUMMARY OF KEY FINDINGS	N/A	In July 1995, there were 514 heat-related deaths and 696 excess deaths. During the most intense heat (July 14-July 20), there were 485 heat-related deaths and 739 excess deaths.	The research summarized here describes how climate change may affect New Jersey and other Northeast states under two different emissions scenarios. The higher-emissions scenario assumes continued heavy reliance on fossil fuels, causing heat-trapping emissions to rise rapidly over the course of the century. The lower-emissions scenario assumes a shift away from fossil fuels in favor of clean energy technologies, causing emissions to decline by mid-century. The Northeast region is projected to see an increase in winter precipitation on the order of 20 -30%
RACIAL/ETHNIC GROUP(S)	White, Black, Latino	N/A	N/A
GEOGRAPHIC REGION	Chicago	Chicago	New Jersey and U.S. Northeast
CLIMATE ISSUE(S)	Heat wave, floods, and hurricanes	Heat wave	Drought, Flooding, Extreme Heat, Air quality, Vector-borne diseases, impacts on forest, agriculture
MEASURE(S) OF VULNERABILITY	N/A	Living alone, living on the higher floors of buildings, living in poverty, living without air-conditioning, and using special and excessive medications	N/A
MEASURE(S) OF HEALTH OUTCOMES	N/A	Heat-related death	N/A
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	N/A	N/A	The Global Warming Solutions Act requires that emissions generated by every aspect of the state's economy, not just electric power plants, must be reduced to 1990 levels by 2020 and further reduced by 2050 to 80 percent below 2006 levels. New Jersey and its municipal governments have a rich array of strategies and policies at their disposal to meet the climate challenge in partnership with other states, businesses, civic institutions, and the public. These strategies and policies can reduce emissions in the following sectors: Electric power, Buildings, Transportation, Industries and large institutions
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	N/A	In July 1995, Chicago experienced a 31% increase over baseline. This may be compared with a 65% increase for Kansas City <sup>4</sup> in 1980 and a 57% increase in St. Louis during the same year. Chicago experienced more excess deaths during July and August of 1955 (885) than in July 1995 (696), but the percentage increase during 1955 was substantially lower.	N/A
CITATION	Klinenberg, E. (2002). A Social Autopsy of Disaster in Chicago. University of Chicago Press.	Whitman, S., Good, G., Donoghue, E. R., Benbow, N., Shou, W., Mou, S. Mortality in Chicago Attributed to the July 1995 Heat Wave. American Journal of Public Health. 1997;87:1515-1518.	Union of Concerned Scientists (NECIA). Confronting Climate Change in the U.S. Northeast: New Jersey, 2007.
LINK	<a href="http://books.google.com/books?hl=en&amp;id=UIMzfeQQM5IC&amp;dq=heat+wave+autopsy+of+a+disaster&amp;printsec=frontcover&amp;source=web&amp;ots=iUD3TEh_ol&amp;sig=eJlQ5IBHeo13_oCFNlqhvYDNQso&amp;sa=X&amp;oi=book_result&amp;resnum=4&amp;ct=result#v=onepage&amp;q&amp;f=false">http://books.google.com/books?hl=en&amp;id=UIMzfeQQM5IC&amp;dq=heat+wave+autopsy+of+a+disaster&amp;printsec=frontcover&amp;source=web&amp;ots=iUD3TEh_ol&amp;sig=eJlQ5IBHeo13_oCFNlqhvYDNQso&amp;sa=X&amp;oi=book_result&amp;resnum=4&amp;ct=result#v=onepage&amp;q&amp;f=false</a>	<a href="http://www.ncbi.nlm.nih.gov/pubmed?term=Mortality%20in%20Chicago%20Attributed%20to%20the%20July%201995%20Heat%20Wave">http://www.ncbi.nlm.nih.gov/pubmed?term=Mortality%20in%20Chicago%20Attributed%20to%20the%20July%201995%20Heat%20Wave</a>	<a href="http://www.climatechoices.org/assets/documents/climatechoices/new-jersey_necia.pdf">http://www.climatechoices.org/assets/documents/climatechoices/new-jersey_necia.pdf</a>



TITLE	Oklahoma Climate Adaptation Efforts	Great Plains Climate Change	Climate Change in Colorado: A Synthesis to Support Water Resources Management and Adaptation
TYPE OF RESOURCE	Power Point	Report	Report
SUMMARY OF KEY FINDINGS	<p>State climate action plans – focus on mitigation strategies, including greenhouse gas emission targets, performance standards, emissions cap and trade, and carbon sequestration</p> <p>State climate adaptation plans – focus on preemptive action to address state’s vulnerability to climate change, extremes, &amp; variability; may be part of or separate from climate action plan</p>	<p>Temperatures are projected to continue to increase over this century, with summer changes being larger than those in winter. Precipitation is also projected to change. Conditions are expected to become wetter in the north and drier in the south. Extreme events such as heat waves, droughts, and heavy rainfall will affect many aspects of life in the Great Plains. Water resources will also be threatened. This will impact the agricultural and ranching activities that provide jobs and income to many of the region’s residents</p>	<p>Colorado’s highly variable climate is a consequence of high elevations and the complex topography of the mountains, plains, and plateaus. statewide temperatures have increased about 2°F over 30 years. This synthesis is based on two methods estimating 2.1°F from 1977 to 2006 and 1.7°F from 1977 to 2006 In regions of Colorado, widespread warming is evident across most climate divisions in the 30-year period In all parts of Colorado, no consistent long-term trends in annual precipitation have been detected in the time periods analyzed. Variability is high, which makes detection of trends difficult.</p> <p>Climate models project Colorado will warm by 2.5°F by 2025 and 4°F by 2050, relative to the 1950–99 baseline</p>
RACIAL/ETHNIC GROUP(S)	N/A	Native American	N/A
GEOGRAPHIC REGION	Oklahoma and all other states	Texas, Oklahoma, Nebraska, Kansas, Wyoming, Eastern Montana and the Dakotas	Colorado
CLIMATE ISSUE(S)	Wildfires, Ice Storm, Drought, Floods, Tornados, Storms	Rising Temperature and Changing Precipitation	Drought, heat waves
MEASURE(S) OF VULNERABILITY	N/A	N/A	
MEASURE(S) OF HEALTH OUTCOMES	Health – infectious and non-infectious diseases (including mental health and diet)	As young adults move out of small, rural communities, the towns are increasingly populated by a vulnerable demographic of the very old and the very young, placing them more at risk for health issues that are projected to increase with climate change.	N/A
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	<ol style="list-style-type: none"> <li>1. Develop integrated system for data collection, quality assurance, mapping, analysis, and monitoring</li> <li>2. Assess the hazards &amp; their impacts (e.g., physical, economic, cultural)</li> <li>3. Assess the vulnerabilities (risk) to and adaptive capacity of each sector</li> <li>4. Enhance communication and coordination within the sector and between sectors</li> <li>5. Build resiliency into infrastructure</li> <li>6. Develop or enhance educational programs for students, workers, &amp; the public</li> <li>7. Promote community-based decisions</li> <li>8. Augment surveillance programs (for disease)</li> <li>9. Review statutes, regulations, laws, policies, &amp; practices</li> </ol>	N/A	N/A
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	Shafer, Mark. Oklahoma Climate Adaptation Efforts. PowerPoint presentation.	Great Plains’ temperature already has increased ~1.5°F relative to a 1960-1979 baseline. By late this century, it is projected to increase by 2.5°F to more than 13°F compared with the 1960-1979 baseline	Recommendations in the Colorado Climate Action Plan (CCAP) include assessing the vulnerability of Colorado’s water resources to climate change, analyzing impacts on interstate water compacts, and planning for extreme events such as drought and flooding.
CITATION	PowerPoint by Oklahoma Climatological Survey	U.S. Global Change Research Program. Great Plains Climate Change Texas, Oklahoma, Nebraska, Kansas, Wyoming, Eastern Montana and the Dakotas. June 2009.	Ray, A. J., Barsugli, J. J., Averyt K. B., et al. Climate Change in Colorado: A Synthesis to Support Water Resources Management and Adaptation. CU-NOAA Western Water Assessment, 2008.
LINK	N/A	<a href="http://geology.com/climate-change/great-plains/">http://geology.com/climate-change/great-plains/</a>	<a href="http://cwcb.state.co.us/public-information/publications/Documents/ReportsStudies/ClimateChangeReportFull.pdf">http://cwcb.state.co.us/public-information/publications/Documents/ReportsStudies/ClimateChangeReportFull.pdf</a>

TITLE	Connecticut: Confronting Climate Change in the U.S. Nor the east	STATE OF CONNECTICUT: DEPARTMENT OF EDUCATION DEPARTMENT OF ENVIRONMENTAL PROTECTION	Studying the Impacts of Global Climate Change in Hawaii
TYPE OF RESOURCE	Report	Letter	Report
SUMMARY OF KEY FINDINGS	<p>Under the higher-emissions scenario Connecticut's cities can expect a dramatic increase in the number of days over 100°F. Snow is an iconic characteristic of Connecticut winters and an integral part of many favorite winter activities and traditions. But rising temperatures over the past few decades have caused snow to become wetter (or more "slushy") and decreased the average number of snow-covered days across the state.</p> <p>The coastal area of Connecticut is home to more than 2 million people—more than 60 percent of the state's population.</p> <p>The number of days over 90°F in large northeastern cities is projected to increase until, by late-century, Hartford could experience nearly 80 such days under the higher-emissions scenario.</p>	<p>Governor Designates National Sustainability Education Week, November 8 – 12.</p> <p>Shares resources for teaching sustainability concepts at all grade levels, including lesson plans aligned with the Connecticut education frameworks and student competitions</p>	<p>With the endorsement to move forward and the acquisition of funding, the ORMP Working Group would define the scope of the study through consultations with key stakeholders, sector representatives, and scientific experts. At a minimum, the scope should include the following tasks:</p> <ol style="list-style-type: none"> <li>1. A multi-sectoral and scientific assessment of climate change impacts at a scale relevant to place-based planning; and</li> <li>2. Key recommendations for the State of Hawaii to move forward with planning for climate change.</li> </ol>
RACIAL/ETHNIC GROUP(S)	N/A	N/A	N/A
GEOGRAPHIC REGION	Connecticut	Connecticut	Hawaii
CLIMATE ISSUE(S)	Temperature, precipitation and snow, drought, flooding, Extreme Heat, Air quality, Vector-borne diseases,	N/A	Increased frequency and severity of storms; drought; sea level rise; shoreline erosion; saltwater intrusion; sea surface temperature rise; and ocean acidification
MEASURE(S) OF VULNERABILITY	N/A	N/A	N/A
MEASURE(S) OF HEALTH OUTCOMES	As the number of very hot days increases, so does the risk of heat stress, heart attack, and even death.	N/A	N/A
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	Connecticut policy makers will need to take steps to protect the state's vulnerable populations and infrastructure, as well as wildlife and critical coastal wetlands. This includes public education, updating and enforcing building codes and land-use regulations, and working with the insurance industry to effectively protect property and people.	We encourage you and your schools to take this opportunity to integrate sustainability into lessons, initiate a project to model sustainability in your facilities and operations, hold an event, or engage your learning communities in some other way. Sustainability concepts are interdisciplinary and span a broad range of subject areas, including environmental education, clean technologies, the green economy, climate science, public health, human rights, and global equity. The exploration of these topics through the lens of sustainability requires critical and creative thinking and innovative problem solving	The ORMP is an integrated, place-based approach to management of Hawaii's natural and cultural resources in the islands, recognizing the ecological connections between the land and sea, the link between human activities and their impacts on the environment, and the need for improved collaboration and stewardship in natural resources governance. This proposal for a climate change study is a demonstration of the collaborative effort among the Working Group's members, and is in clear alignment with the ORMP perspectives to recognize the connections between land and sea, and between human activities and the environment. The plan also provides meaningful context to a number of key issues that will be affected by climate change, such as shoreline erosion, coastal development, coastal hazards, and the preservation of coral reefs and Hawaiian fish ponds. A climate change study will enhance the further development of the ORMP to include more specific recommendations on how to plan for climate change
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	The state's larger cities, such as Bridgeport, Hartford, New Haven, and Waterbury, will need to prepare for an increase in dangerously hot conditions by taking steps (e.g., installing better insulation, establishing heat warning systems and cooling centers) that will lessen the impact of extreme heat on vulnerable populations.	N/A	N/A
CITATION	Union of Concerned Scientists (NECIA). Confronting Climate Change in the U.S. Northeast: Connecticut, 2007.	McQuillan, M. K., Marrella, A. W. (2010). Department of Education and Department of Environmental Protection. Hartford, Connecticut.	Studying the Impacts of Global Climate Change in Hawaii. ORMP Working Group Proposal. September 3, 2008.
LINK	<a href="http://www.climatechoices.org/assets/documents/climatechoices/connecticut_necia.pdf">http://www.climatechoices.org/assets/documents/climatechoices/connecticut_necia.pdf</a>	<a href="http://ctclimatechange.com/wp-content/uploads/2010/10/NSEW-Commissioners-Letter.pdf">http://ctclimatechange.com/wp-content/uploads/2010/10/NSEW-Commissioners-Letter.pdf</a>	<a href="http://hawaii.gov/dbedt/czm/ormp/reports/wg_proposal_climate_change.pdf">http://hawaii.gov/dbedt/czm/ormp/reports/wg_proposal_climate_change.pdf</a>

TITLE	Climate Change 101: State Action	Potential Effects of Climate Change on New Mexico	Climate Change and Rural Communities in the US
TYPE OF RESOURCE	Report	Report	Report
SUMMARY OF KEY FINDINGS	Shows a wide range of policies have been adopted at the state and regional levels to reduce greenhouse gas emissions, develop clean energy resources, and promote more energy-efficient vehicles, buildings, and appliances, among other things	<ul style="list-style-type: none"> <li>Average air temperature substantially warmer by 6-12°F (3.3-6.7°C)</li> <li>Greater warming for winter, nighttime minimum temperatures, and higher elevations</li> <li>More episodes of extreme heat</li> <li>Fewer episodes of extreme cold</li> <li>Longer frost-free period</li> <li>Changes in average precipitation are uncertain, could increase or decrease</li> <li>More extreme events (torrential rain, severe droughts)</li> <li>Continuation of historical patterns of wet and dry cycles, including likely recurrence of multiyear drought (like 1950s)</li> <li>Winter rain instead of snow at all but highest elevations</li> </ul>	Rural communities in the U.S. have an important stake in the climate change debate. First, climate change effects already have direct impacts on our rural populations and economies. Second, climate change legislation and policies currently under consideration in the U.S. will have serious repercussions for rural livelihoods and prosperity. Third, rural residents and the landscapes that they manage have the potential to make important economic and conservation contributions to climate change mitigation and adaptation efforts in the US.
RACIAL/ETHNIC GROUP(S)	N/A	Native Americans	N/A
GEOGRAPHIC REGION	US	New Mexico	U.S.
CLIMATE ISSUE(S)	N/A	Extreme storm events (flash floods, tornadoes), heat waves, Water-borne diseases, Water quality (drought), Food quality and quantity, Pollen- induced disease (allergic reactions, asthma, sinusitis), Psychological effects	Warmer temperatures, hurricanes and wildfires
MEASURE(S) OF VULNERABILITY	N/A	Lack air conditioning, lack of health insurance, access to health care information and providers. People with existing respiratory and cardiovascular disease are among the most susceptible to the effects of air pollution.  Construction workers, farm workers, and others doing strenuous manual labor outdoors would also be more vulnerable.	N/A
MEASURE(S) OF HEALTH OUTCOMES	N/A	Prolonged heat is associated with heat cramps, heat exhaustion and heat stroke, and increases the likelihood of heart attacks and stroke in people with cardiovascular disease.	Increasing heat waves in the Midwest cause higher mortality rates and heat-related illness among vulnerable populations such as the very young and the old
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	<ul style="list-style-type: none"> <li>Regional Cap-and-Trade Initiatives:</li> <li>Regional Greenhouse Gas Initiative</li> <li>Western Climate Initiative</li> <li>Midwestern Greenhouse Gas Reduction Accord</li> <li>Reducing Electricity Emissions:</li> <li>Public Benefit Funds</li> <li>Energy Efficiency Resource Standards</li> <li>Alternative Fuel Policies</li> <li>Transportation Policies:</li> <li>State Emission Targets</li> <li>State Climate Action Plans</li> </ul>	N/A	The majority of federal U.S. policies to mitigate and adapt to climate change impacts are voluntary. However, more extensive mandatory regulations and policies are currently under consideration. A climate bill called the America Clean Energy and Security Act (ACES) was passed in the House of Representatives on June 25, 2009. In its current form, the bill seeks to reduce U.S. greenhouse gas emissions by 17% by 2020 and 83% by 2050 through a cap and trade program (see inset on next page). The bill also would require utilities to produce 15% of their power from renewable sources by 2021 (Rascoe 2009). The bill has been postponed for consideration in the Senate until September, but ACES is an example of the U.S. government's increasing commitment to climate change mitigation
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	N/A	N/A	N/A
CITATION	Pew Center on Global Climate Change and the Pew Center on the States. Climate Change 101: Understanding and Responding to Global Climate Change. 2009.	Agency Technical Work Group, State of New Mexico. Potential Effects of Climate Change on New Mexico. 2005.	Jensen J. K. Climate Change and Rural Communities in the US. Rupri, 2009.
LINK	<a href="http://www.pewclimate.org/docUploads/Climate101-State-Jan09_1.pdf">http://www.pewclimate.org/docUploads/Climate101-State-Jan09_1.pdf</a>	<a href="http://www.nmenv.state.nm.us/aqb/cc/Potential_Effects_Climate_Change_NM.pdf">http://www.nmenv.state.nm.us/aqb/cc/Potential_Effects_Climate_Change_NM.pdf</a>	<a href="http://www.rupri.org/Forms/Climate_Change_Brief.pdf">http://www.rupri.org/Forms/Climate_Change_Brief.pdf</a>

TITLE	California at the Crossroads: Proposition 23, AB 32, and Climate Change	U.S. Latinos and Air Pollution: A Call to Action	Vulnerability and Adaptation to Climate Change: Concepts, Issues, Assessment Methods
TYPE OF RESOURCE	Report	Report	Report
SUMMARY OF KEY FINDINGS	<p>The proponents of Proposition 23 argue that implementation of AB 32 will raise energy prices and reduce employment and, therefore, should be suspended until the state's economy is more robust. They contend that Proposition 23 will benefit California by temporarily delaying expensive and burdensome greenhouse gas reduction measures, while allowing those measures to move forward in the future, when the California economy improves.</p> <p>This white paper evaluates these claims and seeks to provide an independent, objective analysis of the legal and economic consequences of Proposition 23. The analysis contained in this paper is further intended to help inform the public debate and allow voters to make a more fully informed choice in November. Although we have included our own assessments on some points, we have also given readers the factual basis for drawing their own conclusions.</p>	<p>Latinos are highly exposed to ground-level ozone and its harmful effects. According to the Centers for Disease Control and Prevention (CDC), close to 50 percent of all Hispanic-Americans live in counties that frequently violate ground-level ozone standards. The CDC reports that Latino children have higher levels of mercury in their bodies compared with non-Hispanic white children. A recent report by the CDC highlights that Latinos and Asian-Americans are more likely to live in areas where air pollution fails to meet national standards. Current efforts to weaken clean air protections designed to protect the most vulnerable among us are a direct attack on our families' health and well-being. Our leaders can and should wield their power to pass regulations that will generate positive economic and health outcomes rather than burden Americans</p>	<p>This paper reviewed the vulnerability and adaptation literature. A brief discussion revealed that exist many different definitions of adaptation ("autonomous" vs. "planned"). Adaptation measures have received less attention than mitigation measures, in the context of climate negotiations. This may be due to developed countries being confident about their ability to adapt, and more focused on their ability to meet the Kyoto Protocol in a less costly way. Developing countries however will find it an urgent issue to adapt to climate change.</p>
RACIAL/ETHNIC GROUP(S)	N/A	Latinos	N/A
GEOGRAPHIC REGION	U.S.	U.S.	World
CLIMATE ISSUE(S)	N/A	Air pollution (ozone, mercury, and particle matter)	Drought, sea-level rise, flooding
MEASURE(S) OF VULNERABILITY	N/A	Poverty, proximity to polluting industry, insufficient employment, lack of health insurance	Limited technology, education, wealth, and access to resources
MEASURE(S) OF HEALTH OUTCOMES	N/A	Respiratory illnesses (asthma, bronchitis, sore throat, greater susceptibility to infection)	N/A
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	<p>If enacted, Proposition 23 would:</p> <ol style="list-style-type: none"> <li>1. Create uncertainty and increase costs for industries regulated by AB 32 and for state and local officials charged with implementing the law.</li> <li>2. Place additional and potentially inequitable burdens on certain economic sectors to reduce greenhouse gas emissions while exempting other industries.</li> <li>3. Harm the nascent clean energy sector and limit investment in new technologies, while having an unclear, long-term impact on employment.</li> <li>4. Reduce revenue for the state.</li> <li>5. Diminish climate change and renewable energy policy momentum.</li> <li>6. Suspend specific regulatory measures already underway to implement AB 32.</li> </ol>	<ol style="list-style-type: none"> <li>1. The EPA and OMH should continue to fund the study of respiratory illnesses and other air pollution related conditions as they affects Latinos</li> <li>2. State health departments should inform Latinos (through English and Spanish media) about the dangers of air pollution</li> <li>3. State and local governments should require polluting industries around residential neighborhoods to disclose amount of pollution and minimize that amount.</li> </ol> <p>In order to reduce mercury and air toxins:</p> <ol style="list-style-type: none"> <li>1. The EPA must finalize its mercury standards</li> <li>2. The EPA should require power plants to employ a variety of technologies that already exist to effectively capture mercury and other toxic emissions from coal-fired power plants.</li> <li>3. The FDA should make available English-Spanish bilingual fish consumption advisories</li> <li>4. State health departments and departments of environmental protection should post bilingual warnings about fish contamination in local bodies of water</li> </ol>	<p>A program should focus on developing countries, especially those threatened by sea-level rise, or increased evidence of drought. Countries where the economic importance of climate sectors is great or where natural resources are few are good candidates for a needs assessment. Countries where adaptive capacity is low due to limited technology and institutional capability would also be good candidates for initiatives.</p>
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	N/A	The largest Latino communities are found in Arizona, California, Florida, Illinois, New Mexico, New Jersey, New York, Nevada, and Texas. <sup>13</sup> Many of these states are home to the country's worst ozone pollution. <sup>14</sup> As a result, nearly one out of every two Latinos lives in the most ozone-polluted cities in the country. <sup>15</sup>	N/A
CITATION	Elkind, E., Farber, D., Frank, R., Hanemann, M., Kammen, D., Kantenbacher, A., Weissman, S. California at the Crossroads: Proposition 23, AB 32, and Climate Change. Center for Law, Energy and the Environment. September 2010.	Quintero, A., Jaffee, V., Madrid, J., & Ramirez, E. September 2011. Natural Resources Defense Council .	Climate Change Knowledge Network Foundation Paper. Prepared by Santiago Olmos For the Climate Change Knowledge Network July 2001
LINK	<a href="http://urbanhabitat.org/files/CLEE-California_at_the_Crossroads(2).pdf">http://urbanhabitat.org/files/CLEE-California_at_the_Crossroads(2).pdf</a>	<a href="http://latinocoalitiononclimatechange.org/assets/U.S._Latinos_and_Air_Pollution_A_Call_to_Action.pdf">http://latinocoalitiononclimatechange.org/assets/U.S._Latinos_and_Air_Pollution_A_Call_to_Action.pdf</a>	<a href="http://www.aiccproject.org/meetings/Trieste_02/trieste_cd/Resource_Materials/CCKN.pdf">http://www.aiccproject.org/meetings/Trieste_02/trieste_cd/Resource_Materials/CCKN.pdf</a>

TITLE	Temperature Extremes and Health: Impacts of Climate Variability and Change in the U.S.	SOCIETAL VULNERABILITY TO CLIMATE CHANGE AND VARIABILITY	A normative ethical framework in climate change
TYPE OF RESOURCE	Research Article	Research Article	Research Article
SUMMARY OF KEY FINDINGS	This article evaluated temperature-related morbidity and mortality for the 2007 national assessment of impacts of climate change on human health. Under current climate change projections, heat waves and hot weather are likely to increase in frequency, with the overall temperature distribution shifting away from the colder extremes.	Institutions in many wealthy industrialised countries are robust and their societies appear to be relatively well insulated against the impacts of climate variability, economic problems elsewhere and so on. However, many countries are not in this position, and there is a growing group of humanity which is not benefiting from the apparent global adaptive trends. Worst case scenarios reinforce the impact of this uneven distribution of adaptive capacity, both between and within countries.	The article spells out four domains of international distributive justice and the consequent criteria of equity, the purpose being to identify a pluralistic normative ethical framework for climate mitigation and adaptation strategies. Justice and equity should play a major role in favouring collective action against climate change, because the more the various dimensions of such action are just, the more any international climate initiative is feasible in principle. As far as mitigation is concerned, the definition of a just initial allocation of endowments focuses on the criterion of differentiated equality, taking account of undeserved inequalities as suggested by Rawls' theory of justice as fairness. With regard to the subsequent exchange of endowments, the Pareto principle, supplemented by the envy-freeness one, is a viable option.
RACIAL/ETHNIC GROUP(S)	African Americans and other "non whites"	N/A	N/A
GEOGRAPHIC REGION	U.S.	World	World
CLIMATE ISSUE(S)	Cold and hot-weather exposure; air pollution	Climate variability	Climate change (increase in frequency and severity of climatic events)
MEASURE(S) OF VULNERABILITY	Vulnerable subgroups include communities in the northeastern and Midwestern U.S.; urban populations, the poor, the elderly, children, and those with impaired health or limited mobility.	Vulnerability is qualitatively different for different individuals, regions and nations. In the poorest households and economies, food security is a matter of survival. However, in most of the developing world, food security is a threat to livelihoods, the ability to maintain productive systems and healthy economies. In developed economies, and increasingly elsewhere, the vulnerability of food systems poses economic risks and costs for individuals, public enterprises, commercial organisations. Vulnerability is dynamic. Considerable improvements have occurred over the past several decades, while some regression has been noted in Eastern Europe, the former Soviet Union and parts of Africa. While there is an enormous literature on coping strategies in response to drought, famine and deprivation, there is relatively little work on long-term evolution of vulnerability and social development of the most poor and at-risk households.	It is claimed that the impacts of climate change and variability will be heavier on poorer countries which are more vulnerable because of their closer dependence on agriculture, lack of financial resources, technological and institutional backwardness, and low knowledge and research capacity. Poverty-related climate effects include reduced crop yields which give rise to food insecurity, lower incomes, scant economic growth, the displacement of people from coastal areas, exposure to new health risks, and an increase in the frequency and severity of extreme climatic events
MEASURE(S) OF HEALTH OUTCOMES	Cardiovascular disease death, heat stroke,	Food security, emergency management	Exposure to new health risks
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	Preventive efforts are needed to reduce exposures to these extremes among those most vulnerable, and to create equitable and health-promoting circumstances at the individual and community levels, regardless of the uncertainties in the degree to which climate change influences these relationships. Further research is needed to evaluate how subpopulations in the United States, defined by geographic location, biomedical and demographic characteristics, and community context, may respond differently to exposure to temperature extremes. Rigorous evaluation of heat wave and health warning systems, especially as they become implemented on a wider scale in the United States is needed to ensure preventive messages and activities are effective. Further, data from epidemiologic studies can guide whether the use of various parameterizations of temperature and weather exposure (minimum, maximum, mean, diurnal changes, apparent temperature, synoptic air masses, etc.) Provide the most predictive power for mortality and thus would be optimal triggers for preventive action.	Adaptation research needs to begin with an understanding of social and economic vulnerability. It requires a different approach to the traditional IPCC impacts assessment, as human behaviour, institutional capacity and culture are more important than biophysical impacts. Research questions include: The question of spatial and temporal scales - how does adaptation to climate change relate to coping with extreme events, global change and societal vulnerability? What makes our institutions resilient and adaptive across different sectors and policy fields, in the face of global change? What institutions can adapt quickly and which cannot? How can institutional adaptive capacity be developed in diverse settings? And The key question of how poorer regions can improve their resilience in an era of globalisation? "Many societies in the past believed that they had a sustainable way of life only to find some time later that it was not so and that they were unable to make the social, economic and political changes necessary for survival." (Ponting, 1991: 407).	In the sphere of international distributive justice, as far as the mitigation strategy is concerned, a just initial allocation of endowments should rely on the criterion of differentiated equality, which requires a rule that takes account of the actual consumption of energy services owing to the unequal climatic features that affect demand. In the practical terms of climate policy, although this criterion is self-sufficient on ethical grounds, it does not hold per se, for it would entail a shortage of emissions rights in developed countries that ought necessarily to be resolved through the North's purchase of endowments from the South. From this perspective, however, carbon trading has mainly an instrumental role, and the consequent North-South financial flows can, and indeed should, be seen as just compensations to poorer countries due to the industrialized countries' overuse of the scarce atmospheric capacity.
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	Northeastern and Midwestern regions are most vulnerable	N/A	N/A
CITATION	O'Neill, M., and Ebi, K. (2009). Journal of Occupational & Environmental Medicine 51(1): 13-25.	Handmer, J.W., Dovers, S. & Downing, T.E. (1999). Societal Vulnerability to Climate Change and Variability. Mitigation and Adaptation Strategies for Global Change. 4(3): 267-281	Grasso (2007). A normative ethical framework in climate change. Climatic Change 81: 223-246
LINK	<a href="http://journals.lww.com/joem/Abstract/2009/01000/Temperature_Extremes_and_Health_Impacts_of.4.aspx">http://journals.lww.com/joem/Abstract/2009/01000/Temperature_Extremes_and_Health_Impacts_of.4.aspx</a>	<a href="http://www.springerlink.com/www5.sph.uth.tmc.edu:2048/content/m32175h88g048323/">http://www.springerlink.com/www5.sph.uth.tmc.edu:2048/content/m32175h88g048323/</a>	<a href="http://www.springerlink.com/www5.sph.uth.tmc.edu:2048/content/a026112837118026/">http://www.springerlink.com/www5.sph.uth.tmc.edu:2048/content/a026112837118026/</a>

TITLE	Adaptation to Climate Change in the Context of Sustainable Development and Equity	Analysis of differences in hot-weather-related mortality across 44 U.S. metropolitan areas	Connecting people and place: a new framework for reducing urban vulnerability to extreme heat
TYPE OF RESOURCE	Research Article	Research Article	Research Article
SUMMARY OF KEY FINDINGS	Enhancement of adaptive capacity is a necessary condition for reducing vulnerability, particularly for the most vulnerable regions, nations, and socioeconomic groups. Activities required for the enhancement of adaptive capacity are essentially equivalent to those promoting sustainable development. Climate adaptation and equity goals can be jointly pursued by initiatives that promote the welfare of the poorest members of society—for example, by improving food security, facilitating access to safe water and health care, and providing shelter and access to other resources.	This paper reports the results of regression analysis used to identify weather and socioeconomic characteristics of the 44 metropolitan areas that may explain the differences in hot-weather-related mortality. The results show that variability in minimum daily Summer temperatures may be one of the most important factors. This finding suggests that biological or behavioral adaptation occurs in areas that are consistently hot, but not where minimum daily temperature variability is greater. The results also suggest that differences in the availability of air conditioning, standards of living and housing quality contribute to differences in hot-weather-related mortality, but that these factors explain a much smaller share of the variation in hot-weather-related mortality than variability in minimum daily temperatures. The results suggest that whether climate change would result in higher hot-weather-related mortality may depend on the effect on the variability of minimum daily temperatures as well as on the change in absolute temperatures.	The extreme heat vulnerability framework was developed in response to the growing threat of urban heat to human health; it underscores the urgent need to better understand underlying societal vulnerability to this hazard. The proposed analytical framework adopts and expands upon concepts and definitions from previously proposed more generalized frameworks
RACIAL/ETHNIC GROUP(S)	N/A	N/A	N/A
GEOGRAPHIC REGION	World	U.S.	U.S.
CLIMATE ISSUE(S)	Flooding, droughts, storms and other extreme weather conditions; vector-borne disease	Heat wave	Extreme heat
MEASURE(S) OF VULNERABILITY	Analyses to date indicate that adaptive capacity and vulnerability are multidimensional, so that one country (or, more often, a group within a country) may be extremely vulnerable economically whereas another country (or community) is extremely vulnerable in terms of life and livelihood. These different types of vulnerability reflect different types of exposures and adaptive capacities.	Lack of air conditioning, the elderly	The authors define vulnerability of the system as a function of three interactive components: exposure (i.e., climate and synoptic weather conditions which are exacerbated by the reflective, storage, and transportation characteristics of urban materials and vegetation), sensitivity (i.e., the extent to which a system or population can absorb impacts without suffering long-term harm), and adaptive capacity (the potential of a system or population to modify its features and behavior so as to better cope with existing and anticipated stresses).
MEASURE(S) OF HEALTH OUTCOMES	N/A	Heat-related mortality	Heat-related mortality and morbidity
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	Adaptation can significantly reduce adverse impacts of climate change. Adaptation is an important part of societal response to global climate change. Planned, anticipatory adaptation has the potential to reduce vulnerability and realize opportunities associated with climate change effects and hazards. There are numerous examples of successful adaptations that would apply to climate change risks and opportunities. Substantial reductions in climate change damages can be achieved, especially in the most vulnerable regions, through timely deployment of adaptation measures. Implementation of adaptation policies, programs, and measures usually will have immediate as well as future benefits. Adaptations to current climate and climate-related risks (recurring droughts, storms, floods, and other extremes) generally are consistent with adaptation to changing and changed climatic conditions.	One of the motivations for this analysis is the question of how hot-weather-related mortality might be expected to change if global warming occurs as a result of emissions of greenhouse gases. Increased greenhouse gas concentrations are predicted to cause an increase in average global temperatures of 1 to 3.5°C by 2100. Estimates vary significantly with different climate models and assumptions about future emissions of greenhouse gases and other factors. If climate change causes minimum daily temperature variability to be higher during the Summer, or increases the frequency of hot-weather episodes, there may be an increase in hot-weather-related mortality. However, if minimum daily temperature variability decreases as average temperatures increase, then hot-weather-related mortality might stay the same or even decrease.	Negative health outcomes from heat (with and without external drivers) can be reduced through the coping mechanisms employed by individuals, hazard mitigation actions (e.g., land use planning, community-based programs, early warning systems) and adaptation to variable conditions through both physical, infrastructure-based and social measures and focuses on societal vulnerability in the context of heat hazard and human health at the neighborhood scale or the U.S. Census block group. The framework explores relationships of an urban system using GIS analysis tools, which are a commonly used by practitioners and the stakeholders. Mapping data to the local level facilitates ease of use by stakeholders while using human health as an outcome addresses priorities of public health officials.
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	N/A		Areas that experience the most severe heat events in the present climate, such as the western and southern US, will have the greatest increase in heat-wave severity in the second half of the twenty-first century. They also demonstrated that other areas, such as the northwest, which currently experiences few heat waves and is ill prepared to cope with extreme heat, will become more vulnerable to such events.
CITATION	B Smit, O Pilifosova - "Adaptation to Climate Change in the Context of Sustainable Development and Equity." Sustainable Development, 2003, page 880-912	Lauraine G. Chestnut, William S. Breffle, Joel B. Smith, Laurence S. Kalkstein, Analysis of differences in hot-weather-related mortality across 44 U.S. metropolitan areas, Environmental Science & Policy, Volume 1, Issue 1, March 1998, Pages 59-70.	Olga V Wilhelmi and Mary H Hayden 2010 Environ. Res. Lett. 5
LINK	<a href="http://alapaap.observatory.ph/resources/IPCC/TAR/wg2/pdf/wg2TARchap18.pdf">http://alapaap.observatory.ph/resources/IPCC/TAR/wg2/pdf/wg2TARchap18.pdf</a>	<a href="http://www.sciencedirect.com/01676369(98)00015X">http://www.sciencedirect.com/01676369(98)00015X</a>	<a href="http://iopscience.iop.org/1748-9326/5/1/014021">http://iopscience.iop.org/1748-9326/5/1/014021</a>

TITLE	DEVELOPING CREDIBLE VULNERABILITY INDICATORS FOR CLIMATE ADAPTATION POLICY ASSESSMENT	Disparities by Race in Heat-Related Mortality in Four US Cities: The Role of Air Conditioning Prevalence	Health impacts of heat: present realities and potential impacts of a climate change
TYPE OF RESOURCE	Research Article	Research Article	Research Article
SUMMARY OF KEY FINDINGS	<p>The authors address the issue of how to develop credible indicators of vulnerability to climate change that can be used to guide the development of adaptation policies. The authors compare the indicators and measures that five past national-level studies have used and examine how and why their approaches have differed. Other relevant indicator studies of social facets of society as well as vulnerability studies at sub-national level are also examined for lessons regarding best practice. The authors found that the five studies generally emphasise descriptive measures by aggregating environmental and social conditions. However, they vary greatly both in the types of indicators and measures used and differ substantially in their identification of the most vulnerable countries.</p>	<p>Daily mortality is typically higher on hot days in urban areas, and certain population groups experience disproportionate risk. Air conditioning (AC) has been recommended to mitigate heat-related illness and death. The authors examined whether AC prevalence explained differing heat-related mortality effects by race. Prevalence of central AC among Black households was less than half that among White households in all four cities, and deaths among Blacks were more strongly associated with hot temperatures. Central AC prevalence explained some of the differences in heat effects by race, but room-unit AC did not.</p>	<p>Although the majority of research suggests that both heat-related illnesses and asthma prevalence may increase if the climate warms, there are still many uncertainties that cannot be accounted for in the models or the historical record. Demographic changes, the effectiveness of mitigation measures, urban structure changes and adaptation will all play roles in determining how humans respond to climate change. Thus, any 'predictions' must be viewed with caution. However, heat-related mortality is already the leading weather-related killer in the Western world and asthma prevalence is increasing among younger individuals.</p>
RACIAL/ETHNIC GROUP(S)	N/A	African Americans	N/A
GEOGRAPHIC REGION	World	U.S.	U.S.
CLIMATE ISSUE(S)	Climate change	Heat waves	Heat wave
MEASURE(S) OF VULNERABILITY	First, given the differentiation of vulnerability at all levels, scale issues are a critical concern in selecting representative indicators.	Lack of AC (likely correlated with other SES factors indicating vulnerability)	Poverty, access to healthcare
MEASURE(S) OF HEALTH OUTCOMES	N/A	Heat-related mortality	Asthma, heat-related mortality
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	<p>We have identified three areas that warrant serious attention in future studies. The fundamental scale of vulnerability, primarily because of differentiation within the community, is local, though processes operating at broader spatial scales do contribute significantly to patterns of vulnerability at this level. The need to aggregate up to, say, the national scale can lead to the loss of information about pockets of vulnerability and may distort overall conclusions as detail is lost in the process of averaging or accumulation. The dynamic nature of vulnerability, deriving from the interaction of the many processes that determine vulnerability and the constant evolution of levels of vulnerability as adaptation takes place, must also condition the selection of indicators. Second, the authors of indicator studies should be more transparent in defining assumptions and premises. Diverse definitions and uses of concepts, as well as a conflation of purposes and assumptions, have been observed. While diversity in approach is more than appropriate at the development stage of a field of study, the increasing demand for objective analysis of vulnerability to support resource allocation and, ultimately, adaptive strategies warrants a clearer definition of where any study fits into the morphology of vulnerability assessment. Explicit statement of underlying assumptions and premises and potential effects on research outcome is fundamental to the scientific method and is vital if the results are to be compared across different studies, leading to the development of a more thorough conceptual understanding.</p>	<p>The findings of this study are consistent with previous observations that central AC use is protective against heat-related mortality. They also suggest that the strong racial disparities in heat-related mortality are partially explained by central AC prevalence or other socioeconomic factors correlated with central AC prevalence that differ by race. Outreach programs to reduce heat-related mortality, which commonly include ensuring access to cool environments should take into account demographic patterns in AC prevalence to ensure equitable protection.</p>	<p>Regardless of climate change impacts, it is important that we become more aware of the vagaries of weather upon the human body, and develop means to lessen the negative health outcomes.</p>
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	N/A	N/A	N/A
CITATION	Eriksen, S.H., and Kelly, P.M. (2007) Mitigation and Adaptation Strategies for Global Change. Volume 12, Number 4, 495-524	O'Neill, M, Zanobetti, A, & Schwartz, J. (2005). Journal of Urban Health. Volume 82, Number 2, 191-197.	Martens, WJ. Environ Health Perspect. 1998 February; 106(Suppl 1): 241-251.
LINK	<a href="http://www.springerlink.com/www5.sph.uth.tmc.edu:2048/content/kr6481642w504335/">http://www.springerlink.com/www5.sph.uth.tmc.edu:2048/content/kr6481642w504335/</a>	<a href="http://www.springerlink.com/www5.sph.uth.tmc.edu:2048/content/vn07h1416h475647/">http://www.springerlink.com/www5.sph.uth.tmc.edu:2048/content/vn07h1416h475647/</a>	<a href="http://www.ncbi.nlm.nih.gov/www5.sph.uth.tmc.edu:2048/pmc/articles/PMC1533278/">http://www.ncbi.nlm.nih.gov/www5.sph.uth.tmc.edu:2048/pmc/articles/PMC1533278/</a>

TITLE	Modifiers of the Temperature and Mortality Association in Seven US Cities	Policies for accelerating access to clean energy, improving health, advancing development, and mitigating climate change	Adaptation to Climate Variability and Change: Methodological Issues
TYPE OF RESOURCE	Research Article	Report	Workshop Summary
SUMMARY OF KEY FINDINGS	<p>Study findings showed that the relation between hot temperature and mortality was modified by place of death, race, and educational level. Deaths occurring outside of a hospital, among those with a high school education or less, and among Blacks evidenced a much stronger temperature dependence than deaths inside a hospital, among those with more than a high school education, and among Whites, respectively. Evidence for effect modification of cold-related deaths by these same factors was weaker but in the same direction. Weak evidence for modification of the cold effect by age was observed, but temperature-related mortality effects were not differential by gender.</p>	<p>The absence of reliable access to clean energy and the services it provides imposes a large disease burden on low-income populations and impedes prospects for development. Furthermore, current patterns of fossil-fuel use cause substantial ill-health from air pollution and occupational hazards. Impending climate change, mainly driven by energy use, now also threatens health. Policies to promote access to non-polluting and sustainable sources of energy have great potential both to improve public health and to mitigate (prevent) climate disruption. There are several technological options, policy levers, and economic instruments for sectors such as power generation, transport, agriculture, and the built environment. However, barriers to change include vested interests, political inertia, inability to take meaningful action, profound global inequalities, weak technology-transfer mechanisms, and knowledge gaps that must be addressed to transform global markets.</p>	<p>To bring together the various fields relevant to climate adaptation, the IPCC Workshop on Adaptation to Climate Variability and Change (San José, Costa Rica, 29 March - 1 April 1998) involved over 200 experts and incorporated views from many research communities. Relevant fields included those of hazard mitigation and climate variability, even though the mandate of IPCC is limited to assessing climate change.</p>
RACIAL/ETHNIC GROUP(S)	African American	N/A	N/A
GEOGRAPHIC REGION	U.S.	World	World
CLIMATE ISSUE(S)	Extreme temperatures	Greenhouse gas emissions and indoor air pollution	Climate variability (drought, high water events)
MEASURE(S) OF VULNERABILITY	Education (indicator of socioeconomic status), race	Poverty	Access to insurance, social vulnerability (including food security, resource dependency, risks to human health, migration, and economic factors)
MEASURE(S) OF HEALTH OUTCOMES	Heat and cold weather mortality	Lack of access to clean energy currently has major effects on public health through, in particular, the disease burden arising from exposure to high levels of indoor air pollution largely in low-income countries	N/A
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	<p>The present study provides new information on factors that may affect sensitivity to temperature-related mortality. The fact that effect modification by place of death and by race (for the heat effect) was similar across all of the cities enhances the likelihood that these factors are valid markers of increased susceptibility. In the broader context of efforts to understand how the world climate affects human health, our results further support the plausibility of direct effects of temperature on human health, especially in light of the place-of-death finding. They also suggest that socioeconomic position, in this case as indicated by Black race and lower educational attainment, confers additional vulnerability to the effects of extreme temperature.</p>	<p>A comprehensive programme for clean energy should optimise mitigation and, simultaneously, adaption to climate change while maximising co-benefits for health—eg, through improved air, water, and food quality. Intersectoral research and concerted action, both nationally and internationally, will be required.</p>	<p>Many lessons can be learned from past and current experiences to cope with climate variability and natural hazards, most notably in agriculture, water resources, human settlements, human health and coastal zones. It is important to build on these experiences in order to improve capabilities to anticipate or respond to climate-change impacts. The identification of indicators can act as early-warning systems of climate change</p>
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	N/A	N/A	N/A
CITATION	O'Neill, Zanobetti, & Schwartz. Am. J. Epidemiol. (2003) 157 (12): 1074-1082.	Andy Haines, Kirk R Smith, Dennis Anderson, Paul R Epstein, Anthony J McMichael, Ian Roberts, Paul Wilkinson, James Woodcock, Jeremy Woods, Policies for accelerating access to clean energy, improving health, advancing development, and mitigating climate change, The Lancet, Volume 370, Issue 9594, 6-12 October 2007, Pages 1264-1281.	Klein & Maciver (1999). Adaptation to Climate Variability and Change: Methodological Issues. Mitigation and Adaptation Strategies for Global Change 4(3): 189-198
LINK	<a href="http://aje.oxfordjournals.org.www5.sph.uth.tmc.edu:2048/content/157/12/1074.short">http://aje.oxfordjournals.org.www5.sph.uth.tmc.edu:2048/content/157/12/1074.short</a>	<a href="http://www.sciencedirect.com.www5.sph.uth.tmc.edu:2048/science/article/pii/S0140673607612574">http://www.sciencedirect.com.www5.sph.uth.tmc.edu:2048/science/article/pii/S0140673607612574</a>	<a href="http://www.springerlink.com.www5.sph.uth.tmc.edu:2048/content/llv657g171371712/">http://www.springerlink.com.www5.sph.uth.tmc.edu:2048/content/llv657g171371712/</a>



TITLE	Dumping in Dixie: Race, Class, and Environmental Quality
TYPE OF RESOURCE	Book
SUMMARY OF KEY FINDINGS	Describes the efforts of five African American communities, empowered by the civil rights movement, to link environmentalism with issues of social justice. New developments in environmental racism, different organizing strategies, and success stories are also discussed.
RACIAL/ETHNIC GROUP(S)	African Americans
GEOGRAPHIC REGION	U.S.
CLIMATE ISSUE(S)	Toxic waste, chemical emissions, and on-the-job hazards
MEASURE(S) OF VULNERABILITY	Race, poverty
MEASURE(S) OF HEALTH OUTCOMES	Respiratory disease, cancer
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	Different organizing strategies are described.
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	Mainly focused in the South. Houston is cited as case study of. Racism is apparent in land-use outcomes and municipal service delivery (neighborhoods without paved streets running water, regular garbage service).
CITATION	Bullard, Robert D. (2000). "Dumping in Dixie: Race, Class, and Environmental Quality." Third Edition. Westview Press.
LINK	N/A

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# APPENDIX D: REGIONAL COMPENDIUM OF LITERATURE ON CLIMATE CHANGE AND DIVERSE POPULATION

TITLE	Preparing for a Changing Climate: The Potential Consequences of Climate Variability and Change	Exposed: Social Vulnerability and climate change in the US Southeast
TYPE OF RESOURCE	Workshop	Report
SUMMARY OF KEY FINDINGS	The results of various climate change model predictions suggest that there will be increases in precipitation on the order of 10% for all of the Gulf states, except Florida. The initial objectives for the Gulf Coast region were to assess potential consequences of climate change for the region, wetlands, forests, water and air quality, energy and commerce, recreation and community life	<ol style="list-style-type: none"> <li>1. The Social Vulnerability Index is a quantitative measure of social vulnerability to environmental hazards. SoVI provides a way to measure the difference in social vulnerability across states and regions within states. The SoVI uses 32 variables to define the multiple dimensions of vulnerability —called components—and then adds them up to arrive at a single reference point to measure vulnerability. Eight components account for most of the variation in social vulnerability in the study: wealth, age, race, gender, ethnicity, rural farm populations, special needs populations, and employment status.</li> <li>2. Across the Southeast where rural counties are composed mostly of populations disadvantaged by poverty, race, ethnicity, age, and gender, four climate hazards in particular threaten such socially vulnerable populations: drought, hurricane force winds, flooding, and sea-level rise</li> <li>3. An example are Latino communities with some of the highest hazard exposures and highest elevated social vulnerability scores. Local government early warning systems (if existent), face challenges in reaching all Latino families—some are undocumented and either may avoid government evacuations for fear of deportation, or may be unable to read emergency materials written in English</li> <li>4. The Social Vulnerability Index ... is a first step toward developing hazard reduction strategies and improving resilience for some of the nation's most disadvantaged areas</li> <li>5. Roughly 80 percent of all U.S. counties that experience persistent poverty lie in this region</li> </ol>
RACIAL/ETHNIC GROUP(S)	Minorities including African Americans, Hispanics, Asians, and Native Americans were represented	African Americans, Hispanics
GEOGRAPHIC REGION	Gulf Coast region (Texas, Louisiana, Mississippi, Alabama, Florida)	US Southwest (13-state region of the U.S. Southeast: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, South Carolina, Tennessee, Texas, and Virginia)
CLIMATE ISSUE(S)	Heat wave, drought, flooding, tropical storms, tornado, hurricane, wildfires, air pollutants	Drought, hurricane force winds, flooding, and sea-level rise
MEASURE(S) OF VULNERABILITY	N/A	Wealth, age, race, gender, ethnicity, rural farm populations, special needs populations, and employment status
MEASURE(S) OF HEALTH OUTCOMES	Heat shock, asthma, respiratory disease, and allergies.	N/A
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	The Gulf Coast region has collaborated with China through the Chinese Academy of Sciences. The Gulf Coast region also established collaborative efforts with scientists in Italy, Canada, and Jamaica. The Italian scientists organized special seminars and lectures in three universities /institutes for the Gulf Coast region team members. Team members provided technical assistance to the Jamaican Ministry of Agriculture and Forestry Department on management and conservation of the national forests in a changing climate.	<ol style="list-style-type: none"> <li>1. Pass climate change legislation that reduces greenhouse gas emissions, and includes effective and well-resourced domestic and international adaptation programs.</li> <li>2. Strengthen local, state, and regional disaster preparedness and response plans by identifying and prioritizing assistance to those communities least able to cope when disaster strikes</li> <li>3. Promote community programs to help with rebuilding projects that make homes and businesses more resilient to high winds and flooding to prepare and evacuate vulnerable populations during intense storms.</li> </ol>
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	The Mississippi River carries the chemical pollutants of the Central U.S. to the Gulf Coast region.  Large cities such as Houston and New Orleans already have significant problems with air pollution, particularly tropospheric ozone (O3)	Drought exposure is highest in western Texas, followed by Florida, South Carolina, and western Georgia. Almost three-quarters of South Carolina experienced extreme drought during the past three decades. Nearly 38 % of the land area from south Texas to the Delmarva Peninsula in Maryland region is within the hurricane wind zone. Sharkey County, MS not only has the highest level of social vulnerability in the state, 79 percent of the population falls within a 100-year floodplain
CITATION	Ning, Z.H., Turner, R.E., Doyle, T., Abdollahi, K. Preparing for a Changing Climate: The potential Consequences of Climate Variability and Change-Gulf Coast Region. June 2003	Exposed: Social vulnerability and climate change in the U.S. Southeast. Oxfam America. 2009.
LINK	<a href="http://www.usgcrp.gov/usgcrp/Library/nationalassessment/gulfcoast/gulfcoast-brief.pdf">http://www.usgcrp.gov/usgcrp/Library/nationalassessment/gulfcoast/gulfcoast-brief.pdf</a>	<a href="http://adapt.oxfamamerica.org/resources/Exposed_Report.pdf">http://adapt.oxfamamerica.org/resources/Exposed_Report.pdf</a>

TITLE	Global warming more harmful to low-income minorities	The Faces of Climate Change Adaptation: The Need for Proactive Protection of the Nation's Coasts
TYPE OF RESOURCE	Report	Report
SUMMARY OF KEY FINDINGS	<p>Heat-related deaths among blacks occur at a 150 to 200% greater rate than for non-Hispanic whites.</p> <p>Asthma, which has a strong correlation to air pollution, affects blacks at a 36 % higher rate of incidence than whites.</p>	<p>Florida-facing sea level rise, coastal erosion, and increased storm intensity and frequency. A state whose highest point is only 345ft above sea level, a 35-55 inch sea level rise by 2100 would result in an annual property and revenue loss of up to \$345 billion</p> <p>Texas- In the coastal city of Galveston, sea level is already rising by 25 inches per century, and it is likely to rise another 38 inches by 2100.</p> <p>Ohio- The Great Lakes are also experiencing the effects of climate change: increased flooding, lake level changes, and loss of wetlands. In addition to lower lake levels, the Great Lakes region will also see increased flooding as a result of precipitation change.</p>
RACIAL/ETHNIC GROUP(S)	Africans Americans	N/A
GEOGRAPHIC REGION	US (Mississippi, Louisiana, Georgia, Maryland, South Carolina and Alabama)	Florida, Texas, Ohio, Maryland, Massachusetts, California
CLIMATE ISSUE(S)	Air pollution, rising temperatures, storms, floods	Sea level rise and lake level changes, shoreline erosion, increased storm frequency or intensity, changes in rainfall, flooding
MEASURE(S) OF VULNERABILITY	Low-income, unemployment rates	N/A
MEASURE(S) OF HEALTH OUTCOMES	Asthma	N/A
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	Report recommended imposing a fee, tax or allowance auction on polluters that would finance efforts to reduce global warming and would eliminate the financial burden on low-income and moderate-income households. It also proposed investing in energy efficiency and using polluter fees to invest in public utilities, such as schools	<p>Maryland- is one of the most progressive states in adapting to climate change. In August of 2008, Maryland released its Climate Action Plan, detailing the steps necessary for Maryland to adequately cope with its changing climate. As part of the Climate Action Plan, the Commission's Adaptation and Response Working Group (ARWG) developed a Comprehensive Strategy for Reducing Maryland's Vulnerability to Climate Change, Chapter 5 of the Climate Action Plan. This strategy aimed to: promote programs and policies aimed at the avoidance and/or reduction of impact to the existing built environment, as well as to future growth and development in vulnerable coastal areas; enhance preparedness and planning efforts to protect human health, safety and welfare. The Maryland Climate Action Plan also examined the importance of mitigation in a climate policy. Maryland has already taken a proactive approach, instituting the Healthy Air Act, The Clean Cars Act, EmPower Maryland Program, and the Commission on Climate Change.</p> <p>Massachusetts-Governor Patrick signed the Global Warming Solutions Act which affirms the Commonwealth's leadership in clean energy and environmental stewardship by requiring reductions in GHG emissions from 1990 levels by 80 % by 2050 and up to 25 % by 2020. The Massachusetts StormSmart Coasts program offers a comprehensive website designed to help different agencies and stakeholders gather valuable information on adapting coastal areas to climate change. StormSmart Coasts also seeks to educate the community about the impacts of climate change. StormSmart Coasts directs readers to specialized (and often free) training for local officials, and general printed information for citizens</p>
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	Mississippi, Louisiana, Georgia, Maryland, South Carolina and Alabama are in the Atlantic hurricane zone and are expected to be hit with more intense storms, similar to the caliber of hurricanes Katrina and Rita. Those states also have the largest populations of black residents	Florida and Texas have seen an increase in storm frequency and intensity which in turn, has caused increased erosion in coastal areas
CITATION	Radick, L. Global warming more harmful to low-income minorities. Medill Reports, Washington. Jul 24, 2008.	Wyman, J., Carter, D., Weber, J., et al. The Faces of Climate Change Adaptation: The Need for Proactive Protection of the Nation's Coasts. Coastal States Organization's Climate Change Work Group, 2010.
LINK	<a href="http://news.medill.northwestern.edu/washington/news.aspx?id=95563&amp;print=1">http://news.medill.northwestern.edu/washington/news.aspx?id=95563&amp;print=1</a>	<a href="http://coastalstates.org.seedevelopmentprogress.com/wp-content/uploads/2010/07/CSO-White-Paper-on-Climate-Change-Adaptation-May-2010.pdf">http://coastalstates.org.seedevelopmentprogress.com/wp-content/uploads/2010/07/CSO-White-Paper-on-Climate-Change-Adaptation-May-2010.pdf</a>

TITLE	A Climate of Change: African Americans, Global Warming, and a Just Climate Policy for the U.S.	Health Problems Heat Up: Climate Change and the public's health
TYPE OF RESOURCE	Report	Report
SUMMARY OF KEY FINDINGS	<ol style="list-style-type: none"> <li>1. African Americans Are at Greater Risk from Climate Change and Global Warming Co-Pollutants: African Americans suffer heat death at one hundred fifty to two hundred percent of the rate for non-Hispanic whites. 71% of African Americans live in counties in violation of federal air pollution standards, as compared to 58% of the white population. 78% of African Americans live within thirty miles of a coal-fired power plant, as compared to 56% of non-Hispanic whites. African Americans have a 36% higher rate of incidents of asthma than whites</li> <li>2. African Americans Are Economically More Vulnerable to Disasters and Illnesses: Racist stereotypes have been shown to reduce aid donations and impede service delivery to African Americans in the wake of hurricanes, floods, fires and other climate-related disasters as compared to non-Hispanic whites in similar circumstances.</li> <li>3. African Americans Are at Greater Risk from Energy Price Shocks: African Americans spend 30% more of their income on energy than non-Hispanic whites</li> </ol>	<p>Only 12 states have established climate change commissions that include a representative from the state's public health department; Twenty-two states and New York City have received grants from the U.S. Centers for Disease Control and Prevention (CDC) for Environmental Health Tracking, to track connections between health problems and the environment; Thirty-three states have received CDC funds for state asthma control programs; and Every state except Alaska has received funds to track diseases spread through mosquitoes and other insects</p> <p>CEAC cited the following findings from its paper, Global Warming and African Americans, in describing the disproportionate impacts of climate change on African Americans:</p> <ol style="list-style-type: none"> <li>1. Urban dwelling: Because of the "heat island effect," temperature increases are expected to be more extreme in urban areas, where blacks are more than twice as likely to live than whites</li> <li>2. Energy consumption: More African Americans will be "fuel-poor" as the demand for energy rises due to higher air-conditioning loads, population growth, and urbanization. African Americans already spend an estimated 25 % greater share of their income on energy than the national average, and total spending is rising in the face of increasing gasoline and resource prices</li> <li>3. Heat-related deaths: During the 1995 Chicago heat wave, the African American death rate was 1.5 times the rate for non-Hispanic whites. The correlation between lower air conditioning prevalence in African American households and higher heat-related mortality was noted in a study of heat-related deaths in four major U.S. cities. African Americans in the cities had half the rate of air conditioning penetration as whites and almost three times the percent increase in deaths</li> </ol>
RACIAL/ETHNIC GROUP(S)	African American	African American
GEOGRAPHIC REGION	U.S.	US; urban and rural communities, coastal, low lying and mountain regions, and polar regions
CLIMATE ISSUE(S)	Heat Wave, Air Pollutants, Natural disasters, Floods, Fires, Tropical storms	Heat waves, Poor air quality, hurricanes, floods, wildfires, droughts, increased average temperature, rising CO2 levels
MEASURE(S) OF VULNERABILITY	Proximity to hazardous materials & air pollutants Economic factors	Living alone, living on higher floors, living in poverty, living without air conditioning, and using special and excessive medications
MEASURE(S) OF HEALTH OUTCOMES	Heat deaths	Heat Waves-Death, heat stroke, heat exhaustion, and kidney stones; Air Quality-Increased asthma; Increase chronic obstructive pulmonary disease (COPD); Hurricanes-Death from drowning, injuries, depression, post-traumatic stress disorder; Increased monoxide poisoning, increased gastrointestinal illnesses; Floods-increased water and food borne diseases According to the Intergovernmental Panel on Climate Change, vulnerable populations are more likely to suffer from the health effects of climate change, including: Increases in malnutrition and consequent disorders, with implications for child growth and development, Increased deaths, disease and injury due to heat waves, floods, storms, fires and droughts, increased burden of diarrheal disease increased frequency of cardio-respiratory diseases and increased exposure to infectious disease vectors.
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	A well-designed climate and energy policy— one that is financed by polluters—can rapidly substitute energy efficiency and new clean energy technologies for polluting energy sources while strengthening the economy, creating jobs, improving income distribution and improving the relative economic position of African Americans. There are three broad kinds of future energy scenarios that can be defined by who will pay for global warming, each of which has powerful advocates. They will be called the phony reductions future, the corporate windfalls future, and the polluter-pays future.	In May 2009 the State Environmental Health Indicator Collaborative (SEHIC) published a report, Environmental Health Indicators of Climate Change, outlining a series of indicators that could be used for climate change, including surveillance data on climate change-related health outcomes. The 28 indicators are intended to assess vulnerability to climate change-related events and preparedness for these events. They are categorized into four groups: Environmental; Morbidity and Mortality; Vulnerability; and Mitigation, Adaptation, and Policy. Congress should provide funding for state and local health departments to conduct needs assessments and strategic planning for public health considerations of climate change; The White House and the federal interagency working group on climate change should take into account the potential health implications of policies and programs under consideration; Congress should increase support for tracking of environmental effects on health and research into health effects of climate change; CDC should set national guidelines and measures for core public health functions related to climate change, and in exchange for federal funding for climate change planning and response, CDC should require states and localities to report the findings to both the public and the federal government; All state and local health departments should include public health considerations as part of climate change plans, including conducting needs assessments, developing strategic plans, and creating public education campaigns; and Special efforts must be made to address the impact of climate change on at-risk and vulnerable communities.
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	U.S. is using 636 percent of its fair share, while the rest of the developed West uses a little more than half that. The states most at risk from Atlantic hurricanes are located on the Gulf and Atlantic coasts, and six of these states—Mississippi, Louisiana, Georgia, Maryland, South Carolina, and Alabama—have the highest percentage of African Americans in the U.S.; Another study of six northern U.S. cities found that the increased risk of death during a heat episode was twice as large for African Americans as for non-Hispanic whites. <sup>21</sup> Studies have revealed similar patterns in other areas, including St. Louis, Texas, Memphis, and Kansas City.	The Southwest region encompasses the southern Rocky Mountain States -- Arizona, Colorado, New Mexico Nevada, Utah, and southern California. Wildfires are likely to be more frequent and more severe in this region. Residents of the northeastern United States, from West Virginia to Maine, will face more extreme heat and worsening air quality as a result of climate change. Researches predict that populations in high-density urban areas with poor housing will be at increased risk with increases in the frequency and intensity of heat waves, partly due to the interaction between increasing temperatures and urban heat-island effects. Two socio-demographic trends -- the aging of the U.S. population and the growing numbers of obese Americans -- make the United States particularly vulnerable to weather-related disasters. elderly are more vulnerable than younger age groups to injury resulting from weather extremes such as heat waves, storms, and floods.
CITATION	Hoerner, J. A., Robinson, N. A Climate of Change African Americans, Global Warming, and a Just Climate Policy for the U.S. Environmental Justice and Climate Change Initiative 2008.	Levi, J., Vinter, S., Gratale, D., Juliano, C., Segal, L.M. Health Problems Heat Up: Climate Change and the Public's Health. Trust for America's Health. October 2009.
LINK	<a href="http://www.greendmv.org/reports/climateofchange.pdf">http://www.greendmv.org/reports/climateofchange.pdf</a>	<a href="http://healthyamericans.org/reports/environment/TFAHClimateChangeWeb.pdf">http://healthyamericans.org/reports/environment/TFAHClimateChangeWeb.pdf</a>

TITLE	Heat waves and Global Climate Change	The Impact of Climate Change on Minorities and Indigenous Peoples, Minority rights group international	Our Nation's Air - Status and Trends through 2008
TYPE OF RESOURCE	Report		Report
SUMMARY OF KEY FINDINGS	<p>Populations at Increased Risk:</p> <ol style="list-style-type: none"> <li>1. Urban populations-a heat wave causes higher daytime and nighttime temperatures in cities than in rural areas because buildings and asphalt absorb more heat than do trees and plants, while rural areas cool after the sun goes down</li> <li>2. Lower SES-Studies have indicated that lower SES is a risk factor for heat-related mortality. For example, heat wave deaths in St. Louis in 1966 were the highest in inner city areas where population density was higher, open spaces were fewer, and where SES was lower than in surrounding areas</li> </ol>	<p>Part of the problem is that climate change research tends to focus on economic sectors – water, infrastructure, agriculture, settlements and so on – rather than human groups. climate change is thought of sectorally, in terms of agriculture, water and so on, rather than in terms of a people, group or livelihood. --A Brookings Institution report on the Hurricane Katrina disaster found that ‘those areas hit hardest by the flood were disproportionately non-white. Overall, blacks and other minority residents made up 58 % of those whose neighborhoods were flooded, though they encompassed just 45 percent of the metropolitan population.’<sup>9</sup> Within the city itself, 80 per cent of people who had lived in the flooded areas were non-white. Escaping the stricken city was harder for people in the flooded areas, because one in five of them had no access to a car, compared to one in ten without access in the dry areas.</p>	<p>6 common pollutants continue to decline. Total emissions of toxic air pollutants have decreased by approximately 40 percent between 1990 and 2005. Acid rain and haze are declining.</p>
RACIAL/ETHNIC GROUP(S)	N/A	African American	N/A
GEOGRAPHIC REGION	Midwest US	US; World	US
CLIMATE ISSUE(S)	Heat waves, wildfires	Flooding, hurricane	Ozone and black carbon (BC) both affect public health and climate which contribute to the accelerated rates of warming.
MEASURE(S) OF VULNERABILITY	Age, lower socio-economic status	Lack of car	N/A
MEASURE(S) OF HEALTH OUTCOMES	Heat stroke, cardiovascular and respiratory disease, death	N/A	N/A
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	N/A	National Adaptation Programmes of Action and national communications (NAPAs) provide: ‘an opportunity for applying principles of equity and justice to ensure that the voices and priorities of the communities that are most vulnerable to climate change are incorporated into the UNFCCC process on adaptation	In 2007, the U.N. Intergovernmental Panel on Climate Change (IPCC) concluded that climate change is happening now, as evident from observations of increases in global average air and ocean temperatures, widespread snow melt, and rising average sea levels.
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	The model did a good job of simulating the amplitude and the geographic pattern of observed heat wave intensity over North America. Both the model results and the observations show that heat waves are most severe over the Eastern Seaboard, the southern and upper Midwest, and the southwestern United States. Regions already adapted to heat extremes (e.g., the southern, eastern, and southwestern parts of the United States) could experience negative effects	Some academic, non governmental organization (NGO) and media reporting of specific disasters has clearly acknowledged that minority communities have fared worse than others. Examples are the reporting of the New Orleans floods which followed Hurricane Katrina in August 2005, and of the Indian floods in the summer of 2007, in which African Americans and Dalits respectively suffered especially badly.	Twenty-three sites showed an increase of greater than 0.005 ppm. Of the 23 sites that showed an increase, 12 sites measured concentrations above the 2008 ozone standard in the 2006-2008 time period.1 These sites are located in or near the following metropolitan areas: Atlanta, GA; Baton Rouge, LA; Birmingham, AL; Denver, CO; *Four of the 565 sites showed an increase in annual PM2.5 concentrations greater than 1 µg/m3. These sites were located in Montana, Arizona, and Wisconsin. ; ntially zero during the summer in the eastern U.S. Crustal material is a substantial summertime component in Houston, TX, and is generally low elsewhere in the East during all seasons; *Ninety-one sites showed an increase of greater than 10 µg/m3 over the trend period. Five of these sites (Houston, TX; Albany, GA; Phoenix, Figure 22. PM10 concentrations in µg/m3, 2008 (second maximum 24-hour concentration). Note: 2563 (µg/m3) is from a site located in the Mono Basin nonattainment area where the major source of PM10 is from a dry lake bed (Mono Lake). AZ; Butte-Silver Bow, MT; and Trinity County, CA) showed large increases of 50 µg/m3 or more
CITATION	Ebi K. L., Meehl, G. A. Heatwaves and Global Climate Change: The Heat is on: Climate Change and Heatwaves in the Midwest. December 2007.	Baird R., The Impact of Climate Change on Minorities and Indigenous Peoples. Minority Rights Group International. April 2008.	Our Nation's Air: Status and Trends through 2008. United States Environmental Protection Agency. February 2010.
LINK	<a href="http://www.pewclimate.org/docUploads/Regional-Impacts-Midwest.pdf">http://www.pewclimate.org/docUploads/Regional-Impacts-Midwest.pdf</a>	<a href="http://www2.ohchr.org/english/issues/climatechange/docs/submissions/Minority_Rights_Group_International.pdf">http://www2.ohchr.org/english/issues/climatechange/docs/submissions/Minority_Rights_Group_International.pdf</a>	<a href="http://www.epa.gov/airtrends/2010/">http://www.epa.gov/airtrends/2010/</a>

TITLE	Climate Change Indicators in the United States: EPA report	Vulnerability Assessment, Climate Change Impacts, and Adaptation Measures	What are the implications of climate change and variability for Gulf coast transportation?
TYPE OF RESOURCE	Report	Book Chapter	Report
SUMMARY OF KEY FINDINGS	<ol style="list-style-type: none"> <li>Greenhouse gas emissions caused by human activities increased by 14 percent from 1990 to 2008. Carbon dioxide accounts for most of the nation's emissions and most of this increase. Worldwide, emissions of greenhouse gases from human activities increased by 26 percent from 1990 to 2005.</li> <li>Within the United States, parts of the North, the West, and Alaska have seen temperatures increase the most</li> </ol>	<p>This paper reviews the historical development of the conceptual ideas underpinning assessments of vulnerability to climate change. Climate impact assessments, first- and second-generation vulnerability assessments, and adaptation policy assessments are distinguished. Mitigation has traditionally received much greater attention than adaptation in the climate change community, both from a scientific and from a policy perspective. Important reasons for the focus on mitigation are, first of all, that mitigating climate change helps to reduce impacts on all climate sensitive systems, whereas the potential of adaptation measures is limited for many systems.</p>	<p>The results of this investigation shows a wide range of possible impacts on transportation infrastructure and services across the Gulf Coast study area.</p>
RACIAL/ETHNIC GROUP(S)	N/A	N/A	N/A
GEOGRAPHIC REGION	US	US	Gulf Coast region
CLIMATE ISSUE(S)	Heat waves, drought, heavy precipitation, tropical cyclone intensity	West. Floods, water quality problems, increase in temperature, air and water pollution	Hurricanes, higher temperatures, precipitation change, sea level rise,
MEASURE(S) OF VULNERABILITY	Pre-existing medical conditions	N/A	N/A
MEASURE(S) OF HEALTH OUTCOMES	Heat-Related Deaths	Heat stress, waterborne and food borne diseases, poor air quality, extreme weather events, and diseases transmitted by insects and rodents	safety impacts - not defined
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	N/A	<p>EPA's Global Change Research Program (GCRP) is an assessment-oriented program that emphasizes understanding the potential consequences of climate variability and change on U.S. human health, ecosystems, and socioeconomic systems. This program has four areas of emphasis: human health, air quality, water quality, and ecosystem health.</p> <p>In addition, the Cool Homes program offers assistance to elderly, low-income residents to install roof insulation and cool surfaces to save energy and lower indoor temperatures. Philadelphia's system is estimated to have saved 117 lives in its first three years of operation</p>	<p>Additional data is needed: 1) site specific data in GIS format 2) Additional and refined climate data and projections 3) Effects of climate change on freight transport demand 4) Demographic response to climate change 5) Design standards and reconstruction and adaptation costs 6) New materials and technologies 7) Pipelines 8) Land use and climate change interactions 9) Emergency management planning/coordination/modeling 10) Secondary and national economic impacts 11) Site-specific impacts</p>
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	<p>A few areas have seen increases in snowpack, primarily in the southern Sierra Nevada of California and in the Southwest. Six of the 10 most active hurricane seasons have occurred since the mid-1990s. This increase is closely related to variations in sea surface temperature in the tropical Atlantic.</p>	<p>Some examples of regional changes already observed include drying in the Southwest, a reduction of snow- pack/snow-water equivalent in the West, an increase in the incidence of heavy precipitation events across most of the United States, increasing streamflow in the eastern United States, and reduced ice cover on the Great Lakes. Under constant pollution emissions, by the middle of this century, Red Ozone Alert days (when the air is unhealthy for everyone) in the 50 largest cities in the eastern United States, are projected to increase by 68% due to warming alone.</p>	N/A
CITATION	U.S. Environmental Protection Agency. Climate Change Indicators in the United States Report. April 2010.	Vulnerability Assessment, Climate Change Impacts, and Adaptation Measures. U.S. Climate Action Report 2010.	Kafalenos, R.S., Leonard, K.J., Beagan, D.M., Burkett, V.R., Keim, B.D., Meyers, A., et al. (2008). What are the implications of climate change and variability for Gulf coast transportation? In U.S. Climate Change Science Program & Subcommittee on Global Change Research, Impacts of climate change and variability on transportation systems and infrastructure: Gulf coast study, phase I (Chapter 4). Washington, D.C.: U.S. Department of Transportation. Retrieved from <a href="http://www.climatechange.gov/Library/sap/sap4-7/final-report/sap4-7-final-ch4.pdf">http://www.climatechange.gov/Library/sap/sap4-7/final-report/sap4-7-final-ch4.pdf</a> .
LINK	<a href="http://www.epa.gov/climatechange/indicators/pdfs/ClimateIndicators_full.pdf">http://www.epa.gov/climatechange/indicators/pdfs/ClimateIndicators_full.pdf</a>	<a href="http://www.state.gov/documents/organization/140006.pdf">http://www.state.gov/documents/organization/140006.pdf</a>	<a href="http://www.climatechange.gov/Library/sap/sap4-7/final-report/sap4-7-final-ch4.pdf">http://www.climatechange.gov/Library/sap/sap4-7/final-report/sap4-7-final-ch4.pdf</a> .

TITLE	An Assessment of Forest Ecosystem Health in the Southwest	Climate and infectious disease in the southwestern United States	Public health consequences of global climate change in the United States—some regions may suffer disproportionately
TYPE OF RESOURCE	Report	Research Article	Research Article
SUMMARY OF KEY FINDINGS	This report documents an ecological assessment of forest ecosystem health in the Southwest (Arizona and New Mexico). The assessment focuses at the regional level and mostly pertains to lands administered by the National Forest System in the Southwestern Region. Information is presented for use by forest and district resource managers as well as collaborative partners in the stewardship of these lands and resources. The report establishes a scientific basis for conducting forest health projects, provides a context for planning ecosystem restoration, and contributes to the understanding of the physical, biological, and human dimensions of these forests.	As in many parts of the world, climate variability has a strong impact on infectious diseases within the southwestern USA. Moisture and temperature conditions can either indirectly impact disease by providing an environment conducive to the growth of an animal host or reservoir, or directly through the survival and dispersal of an infectious agent. It is also expected that climate change will affect the number of cases and/or the spatial distribution of infectious diseases. Before the effects of climate change on diseases can be determined, an understanding of the basic relationship between incidence and climate variability should be established. A review of climate impacts on four infectious diseases (hantavirus, plague, dengue and coccidioidomycosis) currently found in southwestern USA (or potentially found in the southwest in the case of dengue) is followed by suggested future research to further understand the relationship between climate variability/change and disease.	Interestingly, the southern states show the highest chronic response to heat stress, whereas northern cities show the highest acute response.
RACIAL/ETHNIC GROUP(S)	N/A	N/A	N/A
GEOGRAPHIC REGION	Southwest (Arizona, New Mexico)	Southwest U.S. (Texas, New Mexico, Colorado, Utah, Arizona, Nevada, California)	Regional distribution - U.S.
CLIMATE ISSUE(S)	N/A	Moisture and temperature conditions	N/A
MEASURE(S) OF VULNERABILITY	N/A	N/A	The elderly, the young, the poor, the uninsured, those with preexisting medical conditions
MEASURE(S) OF HEALTH OUTCOMES	N/A	A review of climate impacts on four infectious diseases (hantavirus, plague, dengue and coccidioidomycosis)	Heat associated increase in mortality and morbidity, increases in ground level ozone and other pollutants, increases in insect and animal borne diseases, increases in diseases associated with marine organisms, increases in accidents associated with extreme events
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	Management actions must be coupled with monitoring to evaluate ecosystem responses. Projects must specifically state objectives to establish monitoring needs at the onset of the project, not as an afterthought. Projects should not be initiated unless monitoring needs can be met. In determining monitoring needs, three types of monitoring should be considered: 1) Did the project do what it said it would do (implementation)? 2) Did it work (effectiveness)? 3) Were the assumptions that were made valid (validation)?	Recommendations made for future research on how climate change will impact infectious diseases	N/A
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	Improved information concerning reference conditions for Southwestern forests is needed, specifically the historical ranges and rates of change of numerous ecosystem variables.	N/A	The rodent-borne hantavirus pulmonary syndrome that emerged in the southwestern United States in 1992 and 1993 appears to have been spawned by an anomalous weather event, e.g., a drought that drove the mouse host populations into human habitats in increasing numbers and increased human exposure to virus-contaminated dust. Factors present in the United States, particularly in the South, that can support establishment of an endemic state include: a) the presence of two potential mosquito vectors, <i>A. aegypti</i> and <i>A. albopictus</i> , which have been found across the South and occur in populated areas; b) unscreened dwellings or gardens that allow mosquito-human contact; c) lack of vaccine to protect against disease and lack of natural immunity in the U.S. population; and d) lack of familiarity with the disease by synthesis and metabolism, which favor the American physicians, which potentially can lead to extended disease transmission before control measures are implemented.
CITATION	Dahms, C.W., and B.W. Geils (eds.) (1997), An Assessment of Forest Ecosystem Health in the Southwest, General Technical Report RM -GTR-295. USDA Forest Service, Rocky Mountain Forest and Range Experiment Station, Southwestern Region, Fort Collins, CO. (URL: <a href="http://www.rmrs.nau.edu/publications/rm_gtr_295/">www.rmrs.nau.edu/publications/rm_gtr_295/</a> )	Kolivas, K.N., and A.C. Comrie (2004), Climate and infectious disease in the southwestern United States, Progress in Physical Geography 28:387-398.	Longstreth, J. (1999), Public health consequences of global climate change in the United States—some regions may suffer disproportionately, Environmental Health Perspectives 107(Suppl. 1):169-179.
LINK	<a href="http://www.rmrs.nau.edu/publications/rm_gtr_295/">www.rmrs.nau.edu/publications/rm_gtr_295/</a>	<a href="http://cnre.vt.edu/korine/research.htm">http://cnre.vt.edu/korine/research.htm</a>	<a href="http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1566351/?tool=pubmed">http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1566351/?tool=pubmed</a>

TITLE	Greenhouse Gas Mitigation Potential in U.S. Forestry and Agriculture	Climate and society in the US Southwest: the context for a regional assessment	Social Vulnerability to Environmental Hazards
TYPE OF RESOURCE	Report	Journal Article	Journal Article
SUMMARY OF KEY FINDINGS	This report evaluates the potential for additional carbon sequestration and GHG reductions in U.S. forestry and agriculture over the next several decades and beyond. It reports these reductions as changes from baseline trends, starting in 2010 and projected out 100 years to 2110. The report employs the Forest and Agriculture Sector Optimization Model with Greenhouse Gases (FASOMGHG). FASOMGHG is a partial equilibrium economic model of the U.S. forest and agriculture sectors, with land use competition between them, and linkages to international trade.	This article reviews 5 key contextual elements of the region—its demography, economy, land, water, and institutions and values—and indicate how these conditions predispose certain social groups, economic sectors, or geographic areas to be more or less vulnerable, adaptable, or responsive to climate variability, climate information and climate change. Given the rapid influx of people into the region, the significant economic growth, and competing demands for water and other resources, especially in urban areas, vulnerability to climatic variations is already increasing in some areas of the Southwest. Differences in income, access to institutional resources, or employment options make some individuals or groups less able to cope with the adverse effects of climate changes or to use climate information to guide decisions. And the ability to respond to climatic variability and make the best use of climate information often is constrained both by institutional obligations and by the tense politics of some public land management in the region.	County-level socioeconomic and demographic data were used to construct an index of social vulnerability to environmental hazards, called the Social Vulnerability Index (SoVI) for the United States based on 1990 data. Using the hazards-of-place model of vulnerability, the authors suggest that social vulnerability is a multidimensional concept that helps to identify those characteristics and experiences of communities (and individuals) that enable them to respond to and recover from environmental hazards. The correlates are largely derivative from local case studies of disasters and community responses. There have been few, if any, attempts to develop larger theoretical or conceptual understandings of comparative indicators of social vulnerability, despite the clear need to develop such a robust and replicable set.
RACIAL/ETHNIC GROUP(S)	N/A	Native American and “otherwise marginalized”	African American, Hispanic, Native American, Asian
GEOGRAPHIC REGION	US	The CLIMAS Project has adopted this latter regional focus and taken as its core region the states of Arizona and New Mexico and parts of adjacent U.S. states and northern Mexico	U.S
CLIMATE ISSUE(S)	Greenhouse gases (GHG)	Drought, vector-borne diseases, climate related illnesses	Environmental hazards
MEASURE(S) OF VULNERABILITY	N/A	1) Demography - population growing rapidly, increases in Hispanics and American Indians 2) Economy - the economy is expanding with retail and wholesale trade, services, government, and related activities now much more important in terms of jobs and earnings than region's traditional mining, agriculture, and ranching. 3) Land - Land use is largely rangeland, forest, and open space 4) water - demand for water supply is growing 5) Institutions and values - differences in values and resources are intense related to the allocation of resources	Socioeconomic status, gender, race/ethnicity, age, commercial/industrial development, employment loss, rural/urban, residential property, infrastructure, education, family structure, population growth, medical services, social dependence, special needs populations
MEASURE(S) OF HEALTH OUTCOMES	N/A	N/A	N/A
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	Insights include 1) While national mitigation rates decline over time (under constant price scenarios), cumulative GHG mitigation steadily increases. 2) Identifying attractive activities may require looking at a range of characteristics for each option 3) Achieving a specific mitigation level within a narrow time frame may shift emissions to periods before and after the period of interest 4) Under scenarios of rising GHG payments, forest and agriculture mitigation actions may be delayed 5) GHG incentives reduce net emissions from the forest and agriculture sectors below baseline levels. If the incentives are strong enough, the joint sectors could move from a net emissions source to a sink. 6) Leakage potential from limiting included mitigation activities may be largely confined to the forest sector. 7) Raising GHG mitigation levels in forestry and agriculture can cause environmental co-effects, both good and bad. 8) Payment method will determine efficiency of mitigation activities 9) If outreach is needed to deliver GHG mitigation, these efforts might focus in regions with the largest mitigation potential	Yet, improved climate information could assist decision-makers in dealing with these and other climate-related problems within the region, so long as institutional structures, public attitudes, and other internal and external conditions provide the flexibility to use the information in appropriate ways	The development and integration of social, built environment, and natural hazard indicators will improve our hazard assessments and justify the selective targeting of communities for mitigation based on good social science, not just political whim.
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	In addition, rural residents and businesses use more energy to travel due to longer distances and less public transportation. Mitigation potential is likely to have a regional, uneven distribution. The South-Central, Corn Belt, and Southeast regions possess the largest competitive potential to generate [greenhouse gas] mitigation, while the Rockies, Southwest, and Pacific Coast regions generate the least mitigation	N/A	There are some distinct spatial patterns in the SoVI, with the most vulnerable counties clustered in metropolitan counties in the east, south Texas, and the Mississippi Delta region.
CITATION	US Environmental Protection Agency (EPA) (2005b). “Greenhouse Gas Mitigation Potential in U.S. Forestry and Agriculture,” Office of Atmospheric Programs, Washington, DC, November 2005.	Liverman & Merideth (2002) “Climate and society in the U.S. Southwest: the context for a regional assessment” Climate Research 21: 199–218, 2002	Cutter, S. L., Boruff, B.J., Shirley, W.L. 2003. Social Vulnerability to Environmental Hazards. Social Science Quarterly. 84(2):242-261.
LINK	<a href="http://www.epa.gov/sequestration/pdf/greenhousegas2005.pdf">www.epa.gov/sequestration/pdf/greenhousegas2005.pdf</a>	<a href="http://www.int-res.com/articles/cr2002/21/c021p199.pdf">http://www.int-res.com/articles/cr2002/21/c021p199.pdf</a>	<a href="http://www.colorado.edu/hazards/resources/socy4037/Cutter%20%20%20Social%20vulnerability%20to%20environmental%20hazards.pdf">http://www.colorado.edu/hazards/resources/socy4037/Cutter%20%20%20Social%20vulnerability%20to%20environmental%20hazards.pdf</a>



TITLE	Climate Change and the Upper Rio Grande Watershed: Assessing Impacts and Developing Insights for Strategic Adaptations	
TYPE OF RESOURCE	PowerPoint Presentation	Journal Article
SUMMARY OF KEY FINDINGS	Climatic change can cause significant harm to societies and ecosystems; reducing GHG emissions will likely reduce both the degree and likelihood of adverse conditions; longevity and inertia of atmospheric GHG forcing means some degree of climate change is unavoidable; therefore adaptation is not a question of 'if' but rather of 'how, what where, and when?'	The nature of adaptation to climate variability in the Southwest U.S. is explored using the Middle San Pedro River Valley in southern Arizona as a case study. An integrated vulnerability assessment focuses on the dynamic interaction of natural climatic and hydrological systems with socio-economic systems. This approach reveals that residents in the study region do not perceive short-term or long-term vulnerability to climate variability or climate change. This case study demonstrates how climate variability and an array of socio-economic system characteristics are interwoven to produce patterns of vulnerability and adaptive responses in a desert river valley. Current demographic and economic trends in the Southwest United States clearly demonstrate a pattern of changing livelihoods throughout the region. In Arizona, heavy in-migration and an increasing median age have altered the socio-economic complexion of small communities that once owed their existence to cattle, cotton, and copper. This paper focuses on such a community, or string of communities, located along the Middle San Pedro River, where the railroads, ranching and farming attracted the original residents, but where tourism and retirement now constitute the basis of the local economy. Applying an integrated assessment approach based on rapid ethnography, we explored the changing impacts of climate variability on the livelihoods in this valley, demonstrating how the process of adaptation has buffered not only the actual impacts of climate extremes, but also the local perception of climate as a critical feature of household or community decision-making. As we trace the socio-economic changes in these communities highlighted against hydrologic, climatological, and institutional realities, it is possible to assess the complexities of climate vulnerability and the potential role of improved climate information systems.
RACIAL/ETHNIC GROUP(S)	N/A	N/A
GEOGRAPHIC REGION	Upper Rio Grande Watershed (New Mexico, Texas)	Southwest (Arizona as case study)
CLIMATE ISSUE(S)	Climate change (water supply changes, hydrographic shifts,	Droughts, floods
MEASURE(S) OF VULNERABILITY	N/A	In southeastern Arizona over the last century, the interplay of environmental and socio-economic processes has created 3 distinct sources of vulnerability to which adaptive responses emerged. At one level, the nature of a semi-arid climate, with a highly dispersed spatial and temporal distribution of rainfall, violent rainfall episodes, and extreme summer and winter temperatures, engenders an 'expected' level of climatic variability to which livelihood systems are constantly adapting. Second, in this same region extreme droughts and floods have historically occurred that also stimulated significant adaptive response — some short-run and others more permanent. A third source of vulnerability is embedded in the dynamic interaction between a wider socio-economic context and patterns of climate variability. For example, changes in prices and policies, the emergence of economic competition in some other region, and other extraneous factors have occurred to increase the significance of climate impacts upon certain livelihoods. If, under one socio-economic scenario, current adaptations permit some degree of freedom with regard to climate variability (e.g. ranchers revert to the use of purchased cattle feed during a short drought period, in the context of favorable cattle prices), a change in the socio-economic conditions (i.e. lower cattle prices) can reduce that flexibility and increase the level of climate vulnerability within the livelihood system.
MEASURE(S) OF HEALTH OUTCOMES	N/A	N/A
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	Strengthen capability and expertise in climate science; foster partnerships and alliances to harness capacities across organizations; invest in education and economics development, they keys to unlocking the engine of adaptive capacity	It is unwise to be lulled into the conviction that climate no longer matters, for history suggests otherwise. Rather, a better understanding of climate and its impact on nature and society is needed to guide the human decisions that determine the course of events.
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	N/A	N/A
CITATION	Hurd, B. June 17, 2008. "Far West Texas Climate Change Conference." Climate Change and the Upper Rio Grande Watershed: Assessing Impacts and Developing Insights for Strategic Adaptations.	Finan et al (2002) "Processes of adaptation to climate variability: a case study from the U.S. Southwest" Climate Research 21: 299–310, 2002
LINK	<a href="http://agecon.nmsu.edu/bhurd">http://agecon.nmsu.edu/bhurd</a>	<a href="http://ottokinne.de/articles/cr2002/21/c021p299.pdf">http://ottokinne.de/articles/cr2002/21/c021p299.pdf</a>

TITLE	Great Plains Climate Change	Criteria Air Pollution and Marginalized Populations: Environmental Inequity in Metropolitan Phoenix, Arizona	How Can We Prevent & Prepare for Health Issues in a Changing Climate
TYPE OF RESOURCE	Report	-	Report
SUMMARY OF KEY FINDINGS	Temperatures are projected to continue to increase over this century, with summer changes being larger than those in winter. Precipitation is also projected to change. Conditions are expected to become wetter in the north and drier in the south. Extreme events such as heat waves, droughts, and heavy rainfall will affect many aspects of life in the Great Plains. Water resources will also be threatened. This will impact the agricultural and ranching activities that provide jobs and income to many of the region's residents	-	The U.S. Global Change Research Program (USGCRP) coordinates and integrates federal research on changes in the global environment and their implications for society. Currently, there is no working group dedicated to the impact of climate change on human health. Instead, the Human Contributions and Responses working group lists human health as a significant research topic. Many federal partners, such as the EPA, National Institutes of Health, Centers for Disease Control and Prevention, and others have funded or conducted research on this topic. Public health and medical professionals must play a crucial role in addressing the health impacts of climate change. To ensure that public health professionals are trained and equipped to address these challenges, we must bolster our investment in: research, planning and communicating with the public, and workforce
RACIAL/ETHNIC GROUP(S)	Native American	-	N/A
GEOGRAPHIC REGION	Texas, Oklahoma, Nebraska, Kansas, Wyoming, Eastern Montana and the Dakotas	-	US
CLIMATE ISSUE(S)	Rising Temperature and Changing Precipitation	-	Heat waves, floods, storms, droughts and wildfires
MEASURE(S) OF VULNERABILITY	N/A	-	N/A
MEASURE(S) OF HEALTH OUTCOMES	As young adults move out of small, rural communities, the towns are increasingly populated by a vulnerable demographic of the very old and the very young, placing them more at risk for health issues that are projected to increase with climate change.	-	Increased heat-related deaths and sickness; risks of respiratory infections, aggravation of asthma, increased allergens, and premature death; Increase in the number of people at risk from disease and injury related to floods, storms, droughts and wildfires; mental health impacts; water shortages and malnutrition; and increased incidence of vector-, food-, and water borne diseases. The Rhode Island Department of Health warns that unhealthy levels of ozone can cause throat irritation, coughing, chest pain, shortness of breath, increased susceptibility to respiratory infection, and aggravation of asthma and other respiratory ailments.
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	N/A	-	1. Needs Assessment: assessment of: The state or community's overall vulnerability to climate change (geographic and community characteristics), identification of vulnerable populations who are most at risk for health impacts; 2. Strategic Response Plan: should address: Surveillance- need improved human health surveillance that is integrated with environmental quality and protection monitoring; Communication-Health officials need funds to communicate the risks of climate change to the public, vulnerable populations, health care professionals, and businesses; Workforce-public health workforce will need to draw from a variety of skill sets to effectively address climate change prevention and preparedness; Emergency Response-Health departments must develop the capacity to respond to more frequent and severe weather events and other adverse effects of climate change. This capacity must include planning, table-top exercises, drills, and simulations
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	Great Plains' temperature already has increased ~1.5°F relative to a 1960-1979 baseline. By late this century, it is projected to increase by 2.5°F to more than 13°F compared with the 1960-1979 baseline	-	Arizona is one of the hottest places on earth from June to September. Heat-related illnesses are common during the summer in Arizona. Year after year nearly 800 people are admitted to hospitals because of heat related illnesses.xi As a result, the Arizona Department of Health Services, the Maricopa County Department of Emergency Management, and the City of Phoenix Emergency Management Office developed a Heat Emergency Response Plan. In 2008, the USGCRP identified some of the major climate change and health research gaps: The ability to identify exposure thresholds for climate-sensitive health outcomes, such as heat stress, particularly for at-risk populations; The development of modeling that looks at the health impacts of climate change and gives researchers estimates on the number of people affected by certain events; Tools to monitor and evaluate current climate change preparedness measures, including the costs and benefits of interventions. Ex. effectiveness of heat warning systems/ air quality alert programs; The development of modeling that gives state and local planners the ability to look at vulnerability at the micro level so they know which health effects they should be planning to respond to Research on the built environment and community design, particularly on how to strengthen infrastructure to provide protection against extreme weather events, reduce the effect of urban heat-islands, and maintain drinking and wastewater standards amid rising sea levels and changing precipitation patterns
CITATION	U.S. Global Change Research Program. Great Plains Climate Change Texas, Oklahoma, Nebraska, Kansas, Wyoming, Eastern Montana and the Dakotas. June 2009.		How Can We Prevent & Prepare for Health Issues in a Changing Climate? Trust for America's Health.
LINK	<a href="http://geology.com/climate-change/great-plains/">http://geology.com/climate-change/great-plains/</a>		<a href="http://healthyamericans.org/assets/files/ClimateChangeandHealth.pdf">http://healthyamericans.org/assets/files/ClimateChangeandHealth.pdf</a>

TITLE	Climate Change 101: State Action	Heat-related mortality—Arizona, 1993–2002, and United States, 1979– 2002	Issue brief: Why the EPA Is Important for Latino Families
TYPE OF RESOURCE	Report	Report	Report
SUMMARY OF KEY FINDINGS	Shows a wide range of policies have been adopted at the state and regional levels to reduce greenhouse gas emissions, develop clean energy resources, and promote more energy-efficient vehicles, buildings, and appliances, among other things	During 1979– 2002, a total of 4,780 heat-related deaths in the United States were attributable to weather conditions and that, during 1993– 2002, the incidence of such deaths was three to seven times greater in Arizona than in the United States overall. Public health agencies in communities affected by periods of extreme heat should educate populations at risk (e.g., persons aged >65 years) and consider designing and implementing location- specific heat response plans (HRPs)	1. Two-thirds of Latino families reside in areas that do not meet the federal government's air quality standards. 2. Latinos are three times as likely as whites to die from asthma. Latino children are also 60 percent more at risk than white children to have asthma attacks. Data are compiled from the American Lung Association's report "State of the Air 2010: The report details the 25 most polluted U.S. cities as measured by unsafe levels of particulate pollution and ozone. Center for American Progress analysis finds that 7 out of the 25 worst polluted U.S. cities have Latino populations over 40%. The average Latino population in the 10 worst polluted U.S. cities is 33%
RACIAL/ETHNIC GROUP(S)	N/A	N/A	Hispanic/Latino
GEOGRAPHIC REGION	U.S.	Arizona	US
CLIMATE ISSUE(S)	N/A	Heat waves	Pollution
MEASURE(S) OF VULNERABILITY	N/A	Children, elderly persons, and persons without access to air conditioning are at increased risk for heat-related illness and death. In addition, persons with chronic mental disorders or cardiopulmonary disease and those receiving medications that interfere with salt and water balance, such as diuretics, anticholinergic agents, and tranquilizers that impair sweating, are at greater risk for heat-related illness and death.	Racial/ethnic group, work, health insurance
MEASURE(S) OF HEALTH OUTCOMES	N/A	Death and illness	Asthma. Chronic exposure to harmful pesticides in both the air and water leads to increased risks of cancer, birth defects, and neurological damage.
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	<ul style="list-style-type: none"> <li>Regional Cap-and-Trade Initiatives:</li> <li>Regional Greenhouse Gas Initiative</li> <li>Western Climate Initiative</li> <li>Midwestern Greenhouse Gas Reduction Accord</li> <li>Reducing Electricity Emissions:</li> <li>Public Benefit Funds</li> <li>Energy Efficiency Resource Standards</li> <li>Alternative Fuel Policies</li> <li>Transportation Policies:</li> <li>State Emission Targets</li> <li>State Climate Action Plans</li> </ul>	<p>**Identify a lead agency and other participating agencies and nongovernment organizations, describing roles and responsibilities in detail. **Review plans annually, before onset of warm weather, to review response protocols and confirm participation of lead personnel. **Identify activation and deactivation thresholds for the HRP by using community-specific factors affecting mortality (e.g., extremes in daytime high and nighttime low temperatures and deviation from local norms). **Before a heat emergency, use preexisting communication plans and public education tools to define a clear communications strategy and pathway from the lead agency to first responders, the public, and the media. **Define risk factors, populations at high risk, and methods to reach them (e.g., daily checks on the elderly by social service agency personnel and provision for transportation to air-conditioned public centers). **Establish a method to evaluate and revise the HRP, including post-emergency meetings with participating agencies to review response activities, activation and deactivation thresholds, communication plans, outreach activities, and the association between weather data and heat-related morbidity and mortality.</p>	<p>The EPA released its Second Prospective Study Report on March 1, 2011. The striking results show that in 2010 alone the Clean Air Act prevented over 13 million lost work days and 1.7 million asthma attacks. The tragic events in Japan on March 12 reminded the world that the energy sources we rely on can spell an especially horrifying brand of toxic disaster.</p> <p>Through its monitoring efforts in California, the EPA is protecting Latino families and millions of others from the threat of nuclear radiation.</p>
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	The federal government has established minimum efficiency standards for approximately 30 kinds of residential and commercial products, including washers and dryers, refrigerators and freezers, dishwashers, and air conditioners. Numerous states—including Arizona, California, Connecticut, Maryland, new Jersey, new York,	Within the state, the highest average annual age-adjusted death rates (>10 per million population) occurred in the western counties of Mohave, La Paz, and Yuma.	Phoenix is a top polluted city. The 25 most polluted cities in the country and their Latino populations, 2010:  1. Bakersfield, CA; 2. Fresno-Madera, CA; 3. Pittsburgh-New Castle, PA 4. Los Angeles-Long Beach-Riverside, CA; 5. Birmingham-Hoover-Cullman, AL etc.
CITATION	Pew Center on Global Climate Change and the Pew Center on the States. Climate Change 101: Understanding and Responding to Global Climate Change. 2009.	CDC. Heat-related mortality—Arizona, 1993–2002, and United States, 1979– 2002. MMWR Morb Mortality Wkly Rep. 2005;54:628–630.	Madrid J., Vasquez V. Why the EPA Is Important for Latino Families: Agency Regulates Harmful Pollution that Threatens Them. Center for American Progress. March 23, 2011.
LINK	<a href="http://www.pewclimate.org/docUploads/Climate101-State-Jan09_1.pdf">http://www.pewclimate.org/docUploads/Climate101-State-Jan09_1.pdf</a>	<a href="http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5425a2.htm">http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5425a2.htm</a>	<a href="http://www.americanprogress.org/issues/2011/03/pdf/epa_latinos_english.pdf">http://www.americanprogress.org/issues/2011/03/pdf/epa_latinos_english.pdf</a>

TITLE	Neighborhood microclimates and vulnerability to heat stress	Climate Change and Health in Arkansas	Arkansas Governor's Commission on Global Warming
TYPE OF RESOURCE	Research Article	White Paper	Report
SUMMARY OF KEY FINDINGS	This study examined heat-related health inequalities within one city in order to understand the relationships between the microclimates of urban neighborhoods, population characteristics, thermal environments that regulate microclimates, and the resources people possess to cope with climatic conditions. A simulation model was used to estimate an outdoor human thermal comfort index (HTCI) as a function of local climate variables collected in 8 diverse city neighborhoods during the summer of 2003 in Phoenix, USA. The vulnerability of warmer neighborhoods was exacerbated by residents' lack of adequate social and material resources to cope with extreme heat. In answer to our third question, social networks were weakest in the warmest places.	This document outlines the health effects related to climate change in Arkansas as well as forest health and economic impacts.	This report was developed by the Governor's Commission on Global Warming (established after Act 696). The purpose of the group is to place Arkansas in a position to help stabilize global climate, to allow Arkansas to lead the nation in attracting clean and renewable energy industries to the state, and to reduce consumer energy dependence on current carbon-generating technologies and expenditures.
RACIAL/ETHNIC GROUP(S)	Ethnic minorities	N/A	N/A
GEOGRAPHIC REGION	Phoenix, AZ	Arkansas	Arkansas
CLIMATE ISSUE(S)	Increasing temperatures in urban neighborhoods	Heat waves, drought and heavy precipitation	GHG emissions
MEASURE(S) OF VULNERABILITY	Low SES, ethnic minority groups	N/A	N/A
MEASURE(S) OF HEALTH OUTCOMES	Human thermal comfort index (HTCI) as a function of local climate variables, an indicator of heat stress	Respiratory disease, heart disease, and death from heat waves; vector-borne diseases	N/A
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	The practical use of this study is to suggest that reducing temperatures in vulnerable urban neighborhoods should be a priority driven by informed policy. Many cities and coalitions of cities, supported by national and international organizations, such as the U.S. Environmental Protection Agency and the International Council for Local Environmental Initiatives, have initiated programs for heat island mitigation using three principle strategies: increasing vegetation cover in public spaces, adopting standards for reflective roofing and paving materials, and lowering anthropogenic emissions (City of Phoenix, 2004; Rosenfeld, Akbari, Romm, & Pomerantz, 1998; Rosenfeld et al., 1995). Heat/Health Warning Systems initiated by NOAA have also been instituted in Phoenix and many other cities (Sheridan & Kalkstein, 2004). More could be done, however, to target heat reduction resources and heat warnings to the specific places where they are most needed. Prime candidates for these programs are low-income inner-city neighborhoods and the burgeoning number of middle class communities being built on the urban fringes of development. However, public expenditures to improve the quality of existing housing and provide shade, green parks and community swimming pools would be effective heat mitigation measures and would increase the health and comfort of residents.	N/A	Key Recommendations are provided: recommend a comprehensive set of 54 specific policies to reduce GHG emissions and address climate-, energy-, and commerce-related issues in Arkansas; recommend that Arkansas adopt a statewide, economy-wide global warming pollutant reduction goal to reduce the state's gross GHG emissions below 2000 level by 20% by 2020, 35% by 2025, and 50% by 2035; evaluate the direct costs and direct cost savings of the policy recommendations in Arkansas; review update and approve a comprehensive inventory and forecast of GHG emissions in Arkansas for 1990 through 2025.
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	Phoenix is an important site in which to investigate climate-related health issues because it has a semi-arid to arid climate that is similar to places where many of the world's fastest-growing cities are located (Golden, 2004). Phoenix is intensely hot in the summer—normal maximum summer temperatures	-	-
CITATION	Sharon L. Harlan, Anthony J. Brazel, Lela Prashad, William L. Stefanov, Larissa Larsen, Neighborhood microclimates and vulnerability to heat stress, Social Science & Medicine, Volume 63, Issue 11, December 2006, Pages 2847-2863	Center for Health and Global Environment, Harvard Medical School. November 2009.	Arkansas Governor's Commission on Global Warming: Final Report. October 2008.
LINK	<a href="http://www.sciencedirect.com/0950-2688(06)00373X">http://www.sciencedirect.com/0950-2688(06)00373X</a>	<a href="http://chge.med.harvard.edu/programs/policy/factsheets/Climate%20Change%20and%20Health%20in%20Arkansas.pdf">http://chge.med.harvard.edu/programs/policy/factsheets/Climate%20Change%20and%20Health%20in%20Arkansas.pdf</a>	<a href="http://www.arclimatechange.us">http://www.arclimatechange.us</a>

TITLE	Adapt or Die	Climate Change, the Indoor Environment and Health
TYPE OF RESOURCE	Online Article	Report
SUMMARY OF KEY FINDINGS	<p>illustrates the terrible injustice at the heart of the crisis: Global warming was caused by the rich world's greenhouse gas emissions over the past two centuries, but it tends to punish the poor of today first and worst. This historical reality has given rise to calls for what amount to climate change reparations</p> <p>Is it really possible to protect New Orleans, much of which lies below sea level, from the one- to three-foot rise in sea level that, according to scientists, global warming will likely cause</p>	<p>Poor indoor environmental quality is creating health problems today and impairs the ability of occupants to work and learn. There is inadequate evidence to determine whether an association exists between climate change-induced alterations in the indoor environment and any specific adverse health outcomes. However, available research indicates that climate change may make existing indoor environmental problems and introduce new problems by:</p> <ul style="list-style-type: none"> <li>• Altering the frequency or severity of adverse outdoor conditions that affect the indoor environment.</li> <li>• Creating outdoor conditions that are more hospitable to pests, infectious agents, and disease vectors that can penetrate the indoor environment.</li> <li>• Leading to mitigation or adaptation measures and changes in occupant behavior that cause or exacerbate harmful indoor environmental conditions.</li> </ul>
RACIAL/ETHNIC GROUP(S)	-	N/A
GEOGRAPHIC REGION	New Orleans/Bangladesh	US
CLIMATE ISSUE(S)	Strong hurricanes, floods, fiercer heat waves, harsher droughts, heavier rains and inexorable sea level rise	Air Quality, Flooding, Infectious agents, Thermal stress, Building ventilation, weatherization, energy use
MEASURE(S) OF VULNERABILITY	Poverty	Access to resources, income, social status, poverty; Intrinsic factors (such as age and health) and Extrinsic factors (such as housing and the availability of and ability to go to shelters during extreme weather events)
MEASURE(S) OF HEALTH OUTCOMES	N/A	Increased allergies, asthma Higher rates of respiratory illnesses are some health outcomes associated with low ventilation rates
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	The principle of climate change reparations is already part of international law, at least in theory. Rich countries that have ratified the 1992 UN Framework Convention on Climate Change—a group that includes the United States, though it shuns the convention's 1997 Kyoto Protocol—are legally obliged to fund adaptation efforts in vulnerable developing countries.	<p>The EPA should work with such agencies as the CDC to assist state, territorial, and local health and emergency management agencies in efforts to initiate or expand programs to identify populations at risk for health problems resulting from alterations in indoor environmental quality induced by climate change and to implement measures to prevent or lessen the problems. The EPA and other federal agencies should join to develop or refine protocols and testing standards for evaluating emissions from materials, furnishings, and appliances used in buildings and to promote their use by standards-setting organizations and in the marketplace. Standards should include consideration of emissions over the operational life of products and the effects of changes in indoor temperature, dampness, and pests.</p> <p>The EPA should expand and accelerate its efforts to ensure that indoor environmental quality is protected and enhanced in building-weatherization efforts by facilitating research to identify circumstances in which mitigation and adaptation measures may cause or exacerbate adverse exposures; by reviewing and, where appropriate, changing weatherization guidance to prevent these exposures; and by establishing criteria for the certification of weatherization contractors in health-protective procedures.</p>
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	New Orleans, like Bangladesh, will be looked back on as one of the first great casualties of climate change	<p>What is known is mainly from the Mississippi floods of 1993 and Hurricanes Katrina and Rita in 2005. Brown and colleagues (2006) estimate that in the New Orleans area alone the latter two events caused at least 110,000 homes to have high levels of mold and bacteria and at least 40,000 to be heavily contaminated. Not all dampness is the same for fungi. During Hurricane Katrina, wind-driven saltwater inundated many homes in Mississippi. The result was severe water damage, but the damage was different from that caused by the sustained floods in New Orleans from Lake Pontchartrain.</p> <p>After the water receded in Mississippi, the homes were dried, and mold growth was easily initiated on building materials and furnishings. New Orleans had homes that were essentially like sealed terrariums for several weeks at the end of summer 2005. After Hurricane Katrina (in 2005), hundreds of temporary housing trailers provided by the Federal Emergency Management Agency were found to have elevated levels of formaldehyde. Implications for the continental United States are that the northern tier of states will become wetter with attendant increased runoff and that the southern states will become drier, especially in the West. In the face of those changing patterns of temperature, precipitation, and extreme events, the range and effects of pathogens and pests are also expected to change</p>
CITATION	Hertsgaard, M. "Adapt or Die." Open Society Foundations. 2007.	Committee on the Effect of Climate Change on Indoor Air Quality and Public Health. Climate Change, the Indoor Environment, and Health. Institute of Medicine. 2011.
LINK	<a href="http://www.soros.org/resources/multimedia/katrina/projects/ThroughStorm/story_AdaptDie.php">http://www.soros.org/resources/multimedia/katrina/projects/ThroughStorm/story_AdaptDie.php</a>	<a href="http://www.nap.edu/catalog.php?record_id=13115">http://www.nap.edu/catalog.php?record_id=13115</a>

TITLE	Potential Effects of Climate Change on New Mexico	Climate change: what's in store for New Mexico	Death by Degrees: The Health Threats of Climate Change in New Mexico
TYPE OF RESOURCE	Report	Presentation	Report
SUMMARY OF KEY FINDINGS	<ul style="list-style-type: none"> <li>• Average air temperature substantially warmer by 6-12°F (3.3-6.7°C)</li> <li>• Greater warming for winter, nighttime minimum temperatures, and higher elevations</li> <li>• More episodes of extreme heat</li> <li>• Fewer episodes of extreme cold</li> <li>• Longer frost-free period</li> <li>• Changes in average precipitation are uncertain, could increase or decrease</li> <li>• More extreme events (torrential rain, severe droughts)</li> <li>• Continuation of historical patterns of wet and dry cycles, including likely recurrence of multiyear drought (like 1950s)</li> <li>• Winter rain instead of snow at all but highest elevations</li> </ul>	Many of the issues the authors are concerned about include lack of climate stability, not necessarily living in warmer climates.	Since 1950 there have been 93 three-day heat waves in Albuquerque. More heat brings more cases of heat cramps, heat exhaustion, and heat stroke. In addition, heat tends to exacerbate the death rate from other medical conditions. New Mexico floods and flash floods could occur more frequently and with greater severity. Already the state has the tenth highest flash flood fatality rate in the nation. Flooding increases the risk of water contamination, gastrointestinal illnesses, and property damage. Floods can also result in cases of bacterial diseases and respiratory problems. Drought warrants serious concern in New Mexico. At least one area in the state has been in a severe to extreme drought sometime during 56 of the past 102 years. Cases of rodent- and vector-borne disease could also multiply. Numerous health experts attribute the emergence of hantavirus pulmonary syndrome in New Mexico to environmental conditions resulting from climate extremes and increased rodent populations. This is a very serious health issue in New Mexico as 23 cases of hantavirus, almost fifty percent of all cases to date, have resulted in death. Lack of income and monetary losses may directly affect an individual's ability to afford medical insurance and health care. As it stands, New Mexico has the highest poverty levels in the country, with twenty four percent of the state's population reporting that they are in poverty. <sup>162</sup> Family income is a strong predictor of insurance coverage, so it is no surprise that New Mexico has more individuals without health insurance than most states. <sup>163</sup> If drought reduces the already-low income of many New Mexicans, it may further preclude them from obtaining appropriate health care.
RACIAL/ETHNIC GROUP(S)	Native Americans	N/A	N/A
GEOGRAPHIC REGION	New Mexico	New Mexico	New Mexico
CLIMATE ISSUE(S)	Extreme storm events (flash floods, tornadoes), heat waves, Water-borne diseases, Water quality (drought), Food quality and quantity, Pollen-induced disease (allergic reactions, asthma, sinusitis), Psychological effects	Snow and ice retreat, global warming, drought, hurricane intensity, precipitation variability,	Global warming; extreme cold and wet; wind storms and tornados; thunderstorms and lightening; hail storms, landslides, flash flooding, forest fires; air pollution
MEASURE(S) OF VULNERABILITY	Lack air conditioning, lack of health insurance, access to health care information and providers. People with existing respiratory and cardiovascular disease are among the most susceptible to the effects of air pollution. Construction workers, farm workers, and others doing strenuous manual labor outdoors would also be more vulnerable.	N/A	Poverty, the uninsured
MEASURE(S) OF HEALTH OUTCOMES	Prolonged heat is associated with heat cramps, heat exhaustion and heat stroke, and increases the likelihood of heart attacks and stroke in people with cardiovascular disease.	N/A	Heat Stroke, heat cramps, heat exhaustion, CHF, hypothermia, frostbite, automobile accidents, pedestrian falls, carbon monoxide poisoning; respiratory problems caused by bacteria, mold, and fungi; dengue and encephalitis relapsing fever;
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	-		7 recommendations for residents: 1) electric utilities use low-carbon technologies 2) get your own house in order with efficient lightbulbs etc 3) carpool more and drive less 4) buy an energy efficient car 5) Urge your business to become more energy efficient 6) support candidates who propose policies to slow global warming 7) promote awareness
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	-	Modelling future changes in temperature, soil moisture, precipitation	
CITATION	Agency Technical Work Group, State of New Mexico. Potential Effects of Climate Change on New Mexico. 2005.	Gutzler, D.S. (2005), Climate change: what's in store for New Mexico, presentation at New Mexico Climate Change Advisory Group meeting, October 19, 2005 (URL: <a href="http://www.nmclimatechange.us/ewebeditpro/items/O117F7187">www.nmclimatechange.us/ewebeditpro/items/O117F7187</a> ).	Physicians for Social Responsibility (2000), Death by Degrees: The Health Threats of Climate Change in New Mexico, Physicians for Social Responsibility.
LINK	<a href="http://www.nmenv.state.nm.us/aqb/cc/Potential_Effects_Climate_Change_NM.pdf">http://www.nmenv.state.nm.us/aqb/cc/Potential_Effects_Climate_Change_NM.pdf</a>	<a href="http://www.nmclimatechange.us/ewebeditpro/items/O117F7187">www.nmclimatechange.us/ewebeditpro/items/O117F7187</a> )	<a href="http://www.psr.org/assets/pdfs/death-by-degrees-new-mexico.pdf">www.psr.org/assets/pdfs/death-by-degrees-new-mexico.pdf</a>

TITLE	New Mexico Climate Change Advisory Group	Statement of Impact of Climate Change and Its Implications for Oklahoma	Climate Change Facts: Should Oklahoma be Concerned?
TYPE OF RESOURCE	Report	Report	PowerPoint Presentation
SUMMARY OF KEY FINDINGS	This report includes the following: Proposals for reduction of New Mexico's total greenhouse gas (GHG) emissions to 2000 levels by the year 2012, 10% below 2000 levels by 2020, and 75% by 2050. An inventory of existing and planned actions that contribute to GHG emissions reductions. Consideration of costs and benefits of proposals. An inventory of historical and forecasted GHG emissions in New Mexico. Findings on initiatives to create meaningful regional and national policy to address climate change.	The continued warming of the climate averaged across the globe will create a cascade of climatic shifts which could impact Oklahoma's climate. These shifts will not mean an end of year-to-year natural variability – hot years and cold years will continue, as will wet years and dry years. The projected changes will be seen at time scales averaged over a decade or more. Little is known of the effects climate change will have on severe weather. The ingredients required for severe weather involve complex combinations that do not exhibit clear changes in a warming climate. Further, global climate models are unable to accurately simulate small scale weather events like thunderstorms or tornadoes.	Extreme temperatures will increase and annual precipitations will increase in the northeast and decrease in the southwest U.S., the summer becomes longer and the Spring will arrive earlier, rain free periods will increase, but individual rainfall events will become more intense. Oklahoma can expect more runoff and flooding events, increased pollution and erosion, and possibly less water available
RACIAL/ETHNIC GROUP(S)	N/A	N/A	N/A
GEOGRAPHIC REGION	New Mexico	Oklahoma	Oklahoma
CLIMATE ISSUE(S)	Greenhouse gas emissions	Hot and cold extremes; precipitation changes,	Precipitation events, and extreme temperatures
MEASURE(S) OF VULNERABILITY	N/A	N/A	N/A
MEASURE(S) OF HEALTH OUTCOMES	N/A	N/A	N/A
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	First, a rigorous GHG emissions reporting program is vital to understanding where GHG emissions are coming from and thus where mitigation opportunities lie. A GHG reporting program is also crucial in measuring future progress. Second, a GHG Registry can help recognize and share emission reduction accomplishments. It can also protect entities' interests by rigorously recording their early GHG reduction efforts and accomplishments. Finally, public awareness of climate change is essential to the public's acceptance of concerted climate action, so a comprehensive public education and outreach program is warranted.	OCS recommends that Oklahoma aggressively pursue three initiatives to address the risks of both climate variability and climate change. First, the state should undertake a comprehensive assessment of Oklahoma's social and economic vulnerability to climate variability as well as climate change. Learning to adapt to nature's extremes now will yield benefits in reduced disaster losses, regardless of the future trajectory of climate change. Climate change may also bring economic opportunities that would be identified in such an assessment. Second, OCS encourages efficiency programs to reduce our growing demand for energy. Third, OCS recommends investment in renewable energy technology and production. Oklahoma has already demonstrated the successes of wind energy; similar efforts should be undertaken to advance development of solar and sustainable bio-energy as well as fostering further research and development of wind energy.	Oklahoma must exercise due diligence to protect water resources; water management plans developed for a warmer climate must measure and understand the water budget and develop policies accordingly.
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	N/A	N/A	
CITATION	New Mexico Climate Change Advisory Group. Final Report. December 2006.	Oklahoma Climatological Survey	Ken Crawford, Oklahoma Climatological Survey. Prepared for Water Science Seminar, Oklahoma Water Resources Board. May 14, 2009.
LINK	<a href="http://www.nmclimatechange.us/ewebeditpro/items/O117F10150.pdf">http://www.nmclimatechange.us/ewebeditpro/items/O117F10150.pdf</a>	<a href="http://climate.ok.gov/documents/Statement%20on%20Climate%20Change.pdf">http://climate.ok.gov/documents/Statement%20on%20Climate%20Change.pdf</a>	<a href="http://www.owrb.ok.gov/supply/ocwp/pdf_ocwp/WaterPlanUpdate/waterscienceseminar/CrawfordClimateChange.pdf">http://www.owrb.ok.gov/supply/ocwp/pdf_ocwp/WaterPlanUpdate/waterscienceseminar/CrawfordClimateChange.pdf</a>

TITLE	Oklahoma Climate Adaptation Efforts	Projecting Impacts of Relative Sea Level Rise and Erosion on Texas Barrier Islands	The socio-economic impact of sea level rise in the Galveston Bay Region
TYPE OF RESOURCE	PowerPoint Presentation	Map, Model	Report
SUMMARY OF KEY FINDINGS	<p>State climate action plans – focus on mitigation strategies, including greenhouse gas emission targets, performance standards, emissions cap and trade, and carbon sequestration</p> <p>State climate adaptation plans – focus on preemptive action to address state’s vulnerability to climate change, extremes, &amp; variability; may be part of or separate from climate action plan</p>	The Harte Research Institute is developing models of barrier islands that project changes in the distribution of habitats caused by sea level rise and erosion.	This report models the impacts of two scenarios of sea level rise over the next 100 years (.69 meters and 1.5 meters). For each of these scenarios, researchers estimated the impacts on population, including the number of households displaced, the number of buildings impacted, and impacts of industrial, hazardous, superfund, and solid waste sites.
RACIAL/ETHNIC GROUP(S)	-	N/A	N/A
GEOGRAPHIC REGION	Oklahoma	Texas	Texas
CLIMATE ISSUE(S)	Wildfires, Ice Storm, Drought, Floods, Tornados, Storms	Sea level rise	Seal level rise
MEASURE(S) OF VULNERABILITY	N/A	N/A	Population density
MEASURE(S) OF HEALTH OUTCOMES	Health – infectious and non-infectious diseases (including mental health and diet)	N/A	N/A
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	<ol style="list-style-type: none"> <li>1. Develop integrated system for data collection, quality assurance, mapping, analysis, and monitoring</li> <li>2. Assess the hazards &amp; their impacts (e.g., physical, economic, cultural)</li> <li>3. Assess the vulnerabilities (risk) to and adaptive capacity of each sector</li> <li>4. Enhance communication and coordination within the sector and between sectors</li> <li>5. Build resiliency into infrastructure</li> <li>6. Develop or enhance educational programs for students, workers, &amp; the public</li> <li>7. Promote community-based decisions</li> <li>8. Augment surveillance programs (for disease)</li> <li>9. Review statutes, regulations, laws, policies, &amp; practices</li> </ol>	Results from the model projections are being incorporated into hazards maps that illustrate where upland areas are likely to become wetlands, beaches, or dunes. The maps may be used to plan for future impacts to infrastructure, plan restoration and mitigation projects, and guide development away from areas prone to becoming future critical environments.	While the study only looked at current socio-economic conditions and transported those 100 years into the future and did not account for adaptation, mitigation, or resiliency measures, the results provide a starting place in which to talk about the long-term impact of climate change in Texas and in particular sea level rise. Also of interest but not addressed here is the impact on municipal and county governments as they deal with infrastructure loss, moving populations, and potentially decreasing tax base.
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	N/A	N/A	N/A
CITATION	Shafer, Mark. Oklahoma Climate Adaptation Efforts. PowerPoint presentation.	Gibeaut, J.C., 2009, Projecting impacts of relative sea-level rise, erosion, and storms on Galveston Bay barrier islands: Proceeding of the Ninth Biennial State of the Bay Symposium, Galveston Bay Estuary Program, Texas Commission on Environmental Quality, p. 65	Yoskowitz, D., Gibeaut, J., and McKenzi, A. (2009) The Socio-Economic Impact of Sea Level Rise in the Galveston Bay Region. A report for Environmental Defense Fund.
LINK	PowerPoint by Oklahoma Climatological Survey	<a href="http://www.hartheresearchinstitute.org/geospace-publications">www.hartheresearchinstitute.org/geospace-publications</a>	<a href="http://www.edf.org">http://www.edf.org</a>



TITLE	Adaptation to Climate Change in the Houston-Galveston Area: Perceptions and Prospects	CLIMATE CHANGE AND TEXAS	Economy
TYPE OF RESOURCE	Research	Report	Book Chapter
SUMMARY OF KEY FINDINGS	The overall trend for the state shows that temperatures are rising; the H-GAC region has experienced a warming trend observed from 1901 to 2000 of 0.4 – 0.9°F. These models show that without drastic human intervention to decrease temperatures, the state could expect a 0.56°C rise by 2010, 1.12°C by 2030, and 1.94°C increase by 2050 – only 40 years from now. Climatologists suggest that while overall precipitation for the state will decrease, certain areas of Texas will see increased rainfall. North suggests that west Texas will become more arid and that east Texas will experience more precipitation. Within the next 50 to 100 years the Texas coast is expected to experience a rise of 0.6 to 1.9 feet.	Future climate changes: Recent model calculations suggest that the global surface temperature could increase an average of 1.6-6.3°F by 2100, with significant regional variation. Local climate changes: Based on projections made by the Intergovernmental Panel on Climate Change and results from the United Kingdom Hadley Centre’s climate model (HadCM2), a model that accounts for both greenhouse gases and aerosols, by 2100 temperatures in Texas could increase by about 3°F in spring (with a range of 1-6°F) and about 4°F in other seasons (with a range of 1-9°F). Precipitation is estimated to decrease by 5-30% in winter and increase by about 10% in the other seasons. The amount of precipitation on extreme wet or snowy days in winter is likely to decrease, and the amount of precipitation on extreme wet days in summer is likely to increase. The frequency of extreme hot days in summer would increase because of the general warming trend. Coastal changes: Sea level rise could lead to flooding of low-lying property, loss of coastal wetlands, erosion of beaches, saltwater contamination of drinking water, and decreased longevity of low-lying roads, causeways, and bridges. In addition, sea level rise could increase the vulnerability of coastal areas to storms and associated flooding. Water resources: Water resources in drier climates tend to be more sensitive to climate changes. Because evaporation is likely to increase with warmer climate, it could result in lower river flow and lower lake levels, particularly in the summer. If streamflow and lake levels drop, groundwater also could be reduced. In addition, more intense precipitation could increase flooding. Agriculture: Increases in climate variability could make adaptation by farmers more difficult. Warmer climates and less soil moisture due to increased evaporation may increase the need for irrigation. However, these same conditions could decrease water supplies, which also may be needed by natural ecosystems, urban populations, industry, and other sectors.	Projected climate change over the next century is likely to have only a small measurable impact on the Texas economy. Many of the potential impacts involve problems that are already recognized. Texas needs to address issues such as sea level rise and coastal erosion, air quality in its major urban centers, over-reliance on coal for electricity generation, dwindling availability of water including the conflict between agricultural and urban use, and water quality. Effectively addressing these issues will go a long way towards mitigating the impact of climate change on the State
RACIAL/ETHNIC GROUP(S)	N/A	N/A	N/A
GEOGRAPHIC REGION	Texas	Texas	Texas
CLIMATE ISSUE(S)	Hurricanes, floods, increase in temperature, drought, rising sea level, precipitation	Precipitation changes, sea level rise, warmer temperatures,	Climate change as general term - not specified
MEASURE(S) OF VULNERABILITY	Household Income, % Unemployed, % below poverty level, % with no HS diploma	N/A	N/A
MEASURE(S) OF HEALTH OUTCOMES	Increasing burden from malnutrition, diarrheal, cardio-respiratory, and infectious diseases. Increased morbidity and mortality from heat waves, floods and drought.	Heat-related deaths, malaria and dengue fever, contaminated shellfish poisoning	N/A
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	<ol style="list-style-type: none"> <li>1. Remarket how climate change is perceived; focus on security and public safety</li> <li>2. Focus on constituent education</li> <li>3. Promote a regional viewpoint on climate change</li> <li>4. Highlight academia as a source of adaptation knowledge</li> <li>5. Offer workshops and other support opportunities to involve and educate stakeholders</li> <li>6. Work with other organizations to support funding adaptation at the federal level</li> </ol>	N/A	Texas would benefit economically by taking stronger actions today to address climate change impacts at the State level, and by supporting the adoption of cost-effective, equitable policies at the national level to limit GHG emissions and encourage the use of non-fossil fuel alternatives
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	N/A	N/A	N/A
CITATION	Adaptation to Climate Change in the Houston-Galveston Area: Perceptions and Prospects. The Bush School of Government and Public Service 2009.	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, CLIMATE CHANGE AND TEXAS (1997) 1-4.	Hazleton, J. (2008). Economy. In J. Schmandt, J. Clarkson, & G. R. North (Eds.), The impact of global warming on Texas, 2nd edition (Chapter 9). Austin: University of Texas Press.
LINK	<a href="http://bush.tamu.edu/research/capstones/mpsa/projects/2009/AdaptionToClimateChange.pdf">http://bush.tamu.edu/research/capstones/mpsa/projects/2009/AdaptionToClimateChange.pdf</a>	<a href="http://nepis.epa.gov/Exe/ZyNET.exe/400001YM.TXT?ZyActionD=ZyDocument&amp;Client=EPA&amp;Index=1995+Thru+1999&amp;Docs=&amp;Query=&amp;Time=&amp;EndTime=&amp;SearchMethod=1&amp;TocRestrict=n&amp;Toc=&amp;TocEntry=&amp;QField=&amp;QFieldYear=&amp;QFieldMonth=&amp;QFieldDay=&amp;IntQFieldOp=0&amp;ExtQFieldOp=0&amp;XmlQuery=&amp;">http://nepis.epa.gov/Exe/ZyNET.exe/400001YM.TXT?ZyActionD=ZyDocument&amp;Client=EPA&amp;Index=1995+Thru+1999&amp;Docs=&amp;Query=&amp;Time=&amp;EndTime=&amp;SearchMethod=1&amp;TocRestrict=n&amp;Toc=&amp;TocEntry=&amp;QField=&amp;QFieldYear=&amp;QFieldMonth=&amp;QFieldDay=&amp;IntQFieldOp=0&amp;ExtQFieldOp=0&amp;XmlQuery=&amp;</a>	<a href="http://www.texasclimate.org/Portals/6/Books/ImpactTX/Ch9Hazleton.pdf">www.texasclimate.org/Portals/6/Books/ImpactTX/Ch9Hazleton.pdf</a>

TITLE	Coastal zones and estuaries	The changing climate of Texas	Global climate change
TYPE OF RESOURCE	Book Chapter	Book Chapter	Book Chapter
SUMMARY OF KEY FINDINGS	The Texas coast may be one of the best places on Earth to observe climate change effects outside of the Polar Regions, because the major physical drivers, such as temperature, rainfall, and sea-level rise all can have large and interacting effects in the northwestern Gulf of Mexico region, and indicator species for climate change effects exist to illustrate the story. There are two direct effects, which are already observable, in the instrumental record: rapid sea-level rise and rising sea temperatures. The sea-level rise rates are high because of subsidence, which causes the relative rise to be that much greater. The increasing temperatures are already manifesting indirect changes in habitats and water quality. Forests: If conditions also become drier, the current range of forests could be reduced and replaced by grasslands and pasture. Even a warmer and wetter climate could lead to changes; trees that are better adapted to warmer conditions, such as southern pines, would spread. Under these conditions, forests could become more dense. Ecosystems: In Texas, climate change could weaken and stress trees, making them more susceptible to pine bark beetle outbreaks. Semi-arid grasslands and shrublands are very sensitive to changes in rainfall season and in the amount of rainfall, and could be affected adversely by warmer, drier conditions.	In Texas, temperatures are likely to rise, and future precipitation trends are difficult to call, so it is likely that drought frequency and severity will increase in Texas. If temperatures rise and precipitation decreases, as projected by climate models, Texas would begin seeing droughts in the middle of the 21st century that are as bad or worse as those in the beginning or middle of the 20th century	There are many conclusions in climate science that appear to be robust. These include the general warming of the planet (1.5-4.5°C, or 3-8°F, during the coming century) mainly driven by the increasing concentrations of greenhouse gases. There is (and will continue to be) more warming at the poles than elsewhere and the global hydrological cycle is very likely to intensify between a few and seven percent per degree (Celsius) of warming. If no catastrophic melting occurs on Greenland and/or Antarctica, we can expect Sea Level to rise one to two feet. All the ice on Greenland represents about 18 feet of sea level rise and the same for the West Antarctic ice sheet. The melting of these is unlikely to happen during this century, but there is a small probability of it. Because of the potential consequences, it cannot be taken lightly
RACIAL/ETHNIC GROUP(S)	N/A	N/A	N/A
GEOGRAPHIC REGION	Texas Coast	Texas	Texas
CLIMATE ISSUE(S)	Temperature, rainfall, sea level	Precipitation changes, hurricanes, warming, tornadoes, storms, drought, wildfires	Global warming
MEASURE(S) OF VULNERABILITY	N/A	N/A	N/A
MEASURE(S) OF HEALTH OUTCOMES	N/A	N/A	N/A
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	Focus should be placed on adaptation to hydrological changes in climate. This would include better coastal planning so that human activities account for changing coastlines and habitats, and more concern about nutrient reductions	N/A	N/A
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	N/A	N/A	The forecasting of future climate details for a region as small as Texas is still problematic. This is even more difficult for Texas because of its unique location bordering to its south the contrasting surfaces of arid Mexico and the warm waters of the Gulf of Mexico, these conditions being combined with the prevailing winds across Texas coming from the south most months of the year. Texas is also located at a latitude such that winter weather (cold/warm fronts and rainy passages) crosses most months of the year – these so-called storm tracks are subject to some change as global warming proceeds. Storm tracks are likely to recede northwards with global warming, making the passage of fronts across Texas less frequent in spring and fall. Texas is also situated next to New Mexico and Arizona both of which experience a summer monsoon creeping up the west coast of Mexico. West Texas could benefit from the summer monsoon, if it strengthens. Texas winters are also strongly influenced by the El Nino/La Nina cycle. Typically El Nino brings wet winters to Texas. Hurricanes and tropical storms impinge on Texas Coasts. The frequency and/or intensity of both El Ninos and Tropical Storms might change with global warming. The occurrences and interactions of all these factors make for a precarious forecast for precipitation. There can be legitimate differences of opinion: this author opts for more rain in the eastern part of the state and less in the west, but confesses that strictly speaking the jury is still out
CITATION	Montagna, P., Brenner, J., Gibeaut, J., & Morehead, S. (2008). Coastal zones and estuaries. In J. Schmandt, J. Clarkson, & G. R. North (Eds.), The impact of global warming on Texas, 2nd edition (Chapter 4). Austin: University of Texas Press.	Nielsen-Gammon, J. (2008). The changing climate of Texas. In J. Schmandt, J. Clarkson, & G. R. North (Eds.), The impact of global warming on Texas, 2nd edition (Chapter 2). Austin: University of Texas Press.	North, G. R. (2008). Global climate change. In J. Schmandt, J. Clarkson, & G. R. North (Eds.), The impact of global warming on Texas, 2nd edition (Chapter 1). Austin: University of Texas Press.
LINK	<a href="http://www.texasclimate.org/Portals/6/Books/ImpactTX/Ch4Montagna.pdf">www.texasclimate.org/Portals/6/Books/ImpactTX/Ch4Montagna.pdf</a>	<a href="http://www.texasclimate.org/Portals/6/Books/ImpactTX/Ch2Nielsen-Gammon.pdf">http://www.texasclimate.org/Portals/6/Books/ImpactTX/Ch2Nielsen-Gammon.pdf</a>	<a href="http://www.texasclimate.org/Portals/6/Books/ImpactTX/Ch1North.pdf">www.texasclimate.org/Portals/6/Books/ImpactTX/Ch1North.pdf</a>

TITLE	The epidemiology of heat-related deaths	Planning for Climate Change Mitigation and Adaptation in North Central Texas A Roundtable Discussion
TYPE OF RESOURCE	Research	Round table discussion
SUMMARY OF KEY FINDINGS	<p>A study of the deaths during a 1980 heat wave in Texas revealed death rates that were highest in males, the elderly, Blacks and those engaged in heavy labor, the latter two factors perhaps reflecting socioeconomic status. The data suggest that persistent high temperatures were related to death to a greater degree than the temperature peaks reached.</p> <p>Higher heat death rates in earlier years are believed to be attributable to the limited availability of air conditioning in those years. Populations at particular risk are those of low socioeconomic status, those engaged in heavy physical labor, and the aged. Low socioeconomic status limits the availability of air conditioning and the aged are more likely to have one or more chronic diseases</p>	<p>To examine how this confrontation is playing out in the fast growing, widely sprawling North Central Texas “Metroplex,” the School of Urban and Public Affairs at the University of Texas at Arlington hosted a day long roundtable discussion on “climate planning” practice in the cities most visibly committed to climate action. The school invited the planning directors of the 17 municipalities that are members of CCP and/or signatories of the USCMCPA to designate members of their staffs to attend. Eleven of the directors agreed to do so, and in the end representatives of nine municipalities participated in the July 16, 2009 event. Four major topics were addressed: 1. Mitigation—Urban areas increasingly are recognized as major contributors to global climate change—and as potentially key player in mitigating it. What actions are North Central Texas cities taking to reduce their greenhouse gas emissions? To what extent are these initiatives supported by residents and the business community, and what are the main obstacles to such support? 2. Adaptation—Historical emissions of greenhouse gases are already changing the climate, and to some extent further change is already inevitable. At the regional scale, climate change impacts may include significant changes in temperature, rainfall, and agricultural productivity; increased frequency of severe weather events; and public health challenges, including degraded air quality and exotic diseases such as malaria. Is the need for adaptation to these emerging realities recognized in current planning discussions in North Central Texas? How are cities preparing for these climatic effects? 3. Coordinating mitigation with adaptation—Efforts to mitigate climate change today will reduce the degree to which cities must adapt to the effects of climate change in the future. At the same time, the manner in which cities adapt to climate change may either help or hinder their ability to effectively engage in mitigation. Do our communities recognize this interdependence between mitigation and adaptation? To what extent, and in what ways, might a community’s pursuit of one of these objectives impede its pursuit of the other? How can such conflict be minimized? 4. Regional coordination—How could coordination and collaboration between North Central Texas communities help the region meet the challenges of effective climate change planning? What mechanisms are needed, and what mechanisms are available? What are the obstacles?</p>
RACIAL/ETHNIC GROUP(S)	African Americans	N/A
GEOGRAPHIC REGION	Texas	North Texas
CLIMATE ISSUE(S)	Heat wave	Emission of greenhouse gases
MEASURE(S) OF VULNERABILITY	Socioeconomic status, limited availability of air conditioning	N/A
MEASURE(S) OF HEALTH OUTCOMES	Death	N/A
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	<p>Little traction on climate change mitigation—Despite their participation in national and/or international programs aimed at sharply reducing urban emissions of greenhouse gases by government, business, and residents, the municipalities generally appear to have made little tangible progress in systematically developing initiatives capable of achieving these goals beyond the confines of municipal operations themselves. A notable exception is the City of Denton, whose municipally owned utility is now purchasing enough wind generated electricity to supply 40 percent of the power consumed in the community as a whole (Brown 2009).</p>	<p>**Dominance of economic concerns — The participants indicated, both explicitly and implicitly, that their cities’ day to day and long term decision making on issues that have a direct bearing on climate change continue to be dominated by economic considerations — by the assumption that economic growth in the short or medium term must have priority and that environmental initiatives must not be perceived to infringe upon the traditional prerogatives of developers or traditional understandings of the rights of property owners. It seems that in these communities climate change, despite its enormous implications for public health and welfare and for the economy, both locally and globally, has not yet interrupted the political economic assumptions on which the sprawling, carbon emission intensive development of North Central Texas has been based. **Little traction on climate change mitigation — Despite their participation in national and/or international programs aimed at sharply reducing urban emissions of greenhouse gases by government, business, and residents, the municipalities generally appear to have made little tangible progress in systematically developing initiatives capable of achieving these goals beyond the confines of municipal operations themselves. A notable exception is the City of Denton, whose municipally owned utility is now purchasing enough wind generated electricity to supply 40 percent of the power consumed in the community as a whole (Brown 2009). **Reluctance to talk publicly about climate change — Most of the participants indicated that the sensitive character of the climate change issue in their politically conservative communities makes them and their colleagues reluctant to explicitly address the topic in their daily work, for example, in conversations with the public and presentations to their city councils. To the extent that the municipalities’ numerous environmental initiatives address climate issues, they usually do so indirectly, under the rubric of “sustainability” or via efforts to address air quality, the “urban heat island,” or public health. It appears that even in these “climate progressive” cities, municipal planners generally do not feel they have the political latitude to firmly commit themselves to educating the public, public servants, and business leaders on climate issues and to openly advocating aggressive policies on climate. At the same time, it is worth noting that the participants fairly often brought into the conversation a wide range of “sustainability” initiatives that have little or no direct bearing on climate change, as if to imply that the broader rubric somehow renders it unnecessary to attend specifically to climate concerns. **Little attention to climate change adaptation — Preparations for coping with significant changes in precipitation, temperature, storm intensity, disease vectors, and population dislocation have scarcely made an appearance on the municipalities’ agendas yet. Nor has the need to prevent adaptation initiatives (when they are eventually undertaken) from undermining already inadequate mitigation efforts (cf. Howard 2009).</p>
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	N/A	N/A
CITATION	Greenberg JH, Bromberg J, Reed CM, Gustafson TL, Beauchamp RA, The Epidemiology of Heat- Related Deaths, Texas-1950, 1970 79, and 1980, AJPH. 1983 July; 73(7): 805-807	Howard and Hurst (2009). Planning for Climate Change Mitigation and Adaptation in North Central Texas. A roundtable discussion. School of Urban and Public Affairs - University of Texas at Arlington
LINK	<a href="http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1650898/?page=1">http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1650898/?page=1</a>	<a href="http://www.google.com/url?sa=t&amp;source=web&amp;cd=9&amp;ved=0CEcQFjAI&amp;url=http%3A%2F%2Fdspace.uta.edu%2Fbitstream%2Fhandle%2F10106%2F1921%2FHoward%2520%2526%2520Hurst%25202009%2520Final%2520revised.pdf%3Fsequence%3D4&amp;rct=j&amp;q=North%2C%20G.%20R.%20(2008).%20Global%2">http://www.google.com/url?sa=t&amp;source=web&amp;cd=9&amp;ved=0CEcQFjAI&amp;url=http%3A%2F%2Fdspace.uta.edu%2Fbitstream%2Fhandle%2F10106%2F1921%2FHoward%2520%2526%2520Hurst%25202009%2520Final%2520revised.pdf%3Fsequence%3D4&amp;rct=j&amp;q=North%2C%20G.%20R.%20(2008).%20Global%2</a>

TITLE	HEALTH DISPARITIES: Climate Change and Health: A Native American Perspective
TYPE OF RESOURCE	Journal Article
SUMMARY OF KEY FINDINGS	Native Americans are feeling the effects of dislocation and food shortages they attribute to climate change. Forced to cope with rugged conditions, some tribes have discovered in recent decades that beneath their lands lie valuable resources of great economic value: coal, oil, and natural gas. The fact that these are major emitters of carbon dioxide and other pollutants when burned is outweighed in the minds of some members of these tribes by the immediate economic rewards. Many tribes do not have the organizational infrastructure and capacity to address the impacts of climate change upon their natural resources and physical infrastructure. Although thirty-two states have adopted or are in the process of developing climate change action plans, only one tribe has formally done so, although additional tribes have taken some related measures. Some of these circumstances can be attributed to historical neglect and a lack of funding from the federal government. The tribes are working to change this template through the proposed climate legislation
RACIAL/ETHNIC GROUP(S)	Native Americans
GEOGRAPHIC REGION	U.S. (including Southwest)
CLIMATE ISSUE(S)	Climate change (flooding, erosion, warmer temperatures, depressed water levels and increased water temperature, soil changes)
MEASURE(S) OF VULNERABILITY	N/A
MEASURE(S) OF HEALTH OUTCOMES	N/A
PROGRAM/POLICY INTERVENTION OR RECOMMENDATION	It will be useful to include Native Americans in legislative and agency discussions so the tribes can share their hard-won ecological and resource management knowledge accumulated over the centuries. Legislation is beginning to work its way through Congress, and the CEQ is co-chairing an effort involving more than 20 federal agencies, departments, and offices to discuss a coordinated approach for mitigation and adaptation, with a progress report expected in the fall of 2010
OTHER NOTES--E.G., REGARDING INTENSITY OF EVENTS IN A CERTAIN REGION	Rivers in the Southwest are fed by spring thaw runoff. Changing trends in river flow threaten the agriculture and tourism industries and could force an increase in reliance on sustainable natural resource extraction.
CITATION	Weinhold, B. Environ Health Perspect. 2010 February; 118(2): A64–A65.
LINK	<a href="http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2831938/">http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2831938/</a>

## ABOUT THE TEXAS HEALTH INSTITUTE

Texas Health Institute is a 501c3, which provides leadership in development of health care solutions to shape the health care landscape. As an independent, nonpartisan, nonprofit organization, THI takes a broad view of health care issues and their impact on people and their communities. From acting as a neutral convener and facilitating balanced health care dialogue, to creating a vision of improved health care, THI provides innovative, “outside the box” collaboratively developed options to improve the health of people and their communities.

## ABOUT THE COMMISSION TO ENGAGE AFRICAN AMERICANS ON CLIMATE CHANGE

The Joint Center’s Commission to Engage African Americans on Climate Change is comprised of leading experts representing scientists, scholars, policymakers, entrepreneurs, leaders in public health, industry, business, and the media, educators, civil rights activists, and environmentalists to provide input and advice to the Joint Center regarding research priorities, equitable energy and climate policy, and ongoing outreach efforts. Key areas of focus include providing pivotal research and support

## ABOUT THE JOINT CENTER

The Joint Center for Political and Economic Studies conducts research and policy analysis on topics of concern to African Americans and other people of color. Initially founded in 1970 to encourage African American political participation and to support newly-elected black public officials in the wake of the passage of the Voting Rights Act, the Joint Center continues to promote civic and political engagement and support black leadership-as the primary route to greater equality and opportunity.

Today the Joint Center’s approach includes identifying and examining critical emerging issues, as well as collaborating with highly-regarded scholars and experts in designing and conducting rigorous investigations and studies. We publicize our research findings in relevant policy circles and among targeted audiences through publications such as research reports and policy briefs and forums and seminars that often are crafted collaboratively with our strategic partners. We reach the public through both traditional and social media channels.

In recent years, the Joint Center has established several institutes to spotlight key issues. Our Health Policy Institute has played an important role in the debate over health care reform and health disparities. Our Media and Technology Institute has been in the forefront of the debate over broadband access and other issues related to emerging communications technologies. We recently launched a Civic Engagement and Governance Institute that includes other vital issues such as economic and retirement security, and voting patterns. And we have devoted significant resources to supporting our energy and environment program with a distinguished national Commission to Engage African Americans on Climate Change.

The Joint Center facilitates analysis of issues through the lens of the African American community, with the goal of ensuring that its views are heard and its findings are considered in the public policy development process. We do this by engaging elected and appointed officials with regard to our body of work on the racial and socioeconomic aspects of public policy. We do not take positions on public policy proposals or advocate official positions. Recognizing that complex issues require the engagement, understanding and commitment of society at large, the Joint Center aims to provide a forum where disparate interests can seek common ground and move forward toward policy solutions.

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