

RESEARCH ON CLIMATE ADAPTATION/RESILIENCE PLANNING

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THE CASE FOR PLANNING FOR A WARMER WORLD

[U.S. National Climate Assessment](#)¹

- Planning for adaptation (to address and prepare for impacts) and mitigation (to reduce future climate change, for example by cutting emissions) is becoming more widespread, but current implementation efforts are insufficient to avoid increasingly negative social, environmental, and economic consequences. Actions to reduce emissions, increase carbon uptake, adapt to a changing climate, and increase resilience to impacts that are unavoidable can improve public health, economic development, ecosystem protection, and quality of life.²

[State, Local, and Tribal Leaders Task Force on Climate Preparedness and Resilience](#)³

- “Carbon pollution has been building in our atmosphere for decades, so even as we act to reduce the emissions of greenhouse gases that drive climate change, we must also prepare our communities for the impacts that can no longer be avoided. Anticipating and planning for these impacts now can reduce the harm and long-term costs of climate change to communities.”⁴

The City and the Coming Climate: Climate Change in the Places We Live by [Brian Stone, Jr.](#)⁵ (Cambridge University Press, 2012). From [my review of this book](#)⁶:

- Cities are heating up at *double* the rate of global climate change, with major implications for human health. Managing urban heat is just as important a response to climate change as reducing greenhouse gas (GHG) emissions, and the benefits will be felt much sooner. Cities should prioritize strategies that reduce both heat and GHG emissions, and trees are at the top of that priority list.
- Most urban policy makers are preparing for an extent of warming (if they are preparing at all) equivalent to these global-scale projections based on GHG emissions. *This assumption profoundly underestimates the magnitude of warming that urban populations are confronting.* That’s because warming in cities has two causes: GHG emissions and the urban heat island. Whatever warming trends are indicated from rising GHG, the urban heat island effect is going to render cities even hotter. His research indicates that “most large U.S. cities are not only warming faster than the planet as a whole, they are warming at *double* the rate of global climate change.”

[Risky Business: The Economic Risks of Climate Change in the United States](#)⁷

- “If we act aggressively to both adapt to the changing climate and to mitigate future impacts by reducing carbon emissions, we can significantly reduce our exposure to the worst economic risks from climate change, and also demonstrate global leadership on climate.”
- [Climate and the Economy: Texas](#)⁸: “Texas is likely to be among the states hit hardest by the impacts of climate change, with extreme heat taking its toll on workers, crops, and vulnerable communities. Under a “business as usual” scenario – in which business and political leaders maintain the status quo of carbon emissions – climate change is also likely to drive up electricity costs and destroy billions of dollars’ worth of coastal property...[T]he most severe risks can be avoided through early investments in resilience, and through immediate public and private sector action to reduce the pollution that causes climate change.”

ADAPTATION/RESILIENCE PLANNING FOCUSED ON CLIMATE IMPACTS

White House and Administrative Agencies

- 2013 June: White House: [The President's Climate Action Plan](#):⁹ One of three strategies is “prepare the U.S. for the impacts of climate change.”
- 2013 November: [Executive Order 13653: Preparing the United States for the Impacts of Climate Change](#)¹⁰
 - Two “Preparedness Pilots” – City of Houston and State of Colorado - will bring together federal agencies and local communities to assess and plan for their region-specific vulnerabilities and interdependencies associated with the impacts of climate change. Other steps to address preparedness, rebuilding and resilience are outlined in this [7/16/14 Fact Sheet](#).¹¹
- 2013: [Task Force on Climate Preparedness and Resilience](#)¹² formed
- 2014: [President's Climate Data Initiative](#)¹³ announced development of data-driven planning and resilience tools for local communities.
- 2014: [EPA June 2014 Policy Statement on Climate Change Adaptation](#)¹⁴: Implementation of several items pursuant to the Executive Order, including financial assistance, tools, training and technical support to local governments.
- 2014: [White House announces administrative actions](#), based on Task Force's early feedback, to support climate preparedness and increase community resilience.
- 2014: [Task Force's recommendations](#)¹⁵ published
- 2014: [U.S. Climate Resilience Toolkit](#)¹⁶ released

[Southeast Florida Regional Climate Change Compact](#)¹⁷

- Led by Broward, Miami-Dade, Monroe and Palm Beach Counties, collaborative process involving nearly 100 subject matter experts, with 109 cities represented: a voluntary regional plan to mitigate the causes and adapt to the consequences of climate change.
- SE Florida's process can be a model for other regional planning efforts:
 - “The overall objective was to integrate climate adaptation and mitigation into existing decision-making systems and to develop a plan that can be implemented through existing local and regional agencies, processes and organizations.”
 - 2009 Regional Climate Leadership Summit
 - Steering Committee: small group of professional staff
 - Three work groups - Built Environment, Transportation, Land and Natural Systems - each of 30+ individuals from all parts of the region, developed specific recommendations for reducing GHG emissions and building climate resilience
 - Staff and “Super Committee” finalized work group recommendations into draft Regional Climate Action Plan
 - Public comment period with “many public presentations” preceded final plan
- [Regional Climate Action Plan](#)¹⁸ published October 2012, has 110 action items in 7 goal areas:
 - Sustainable Communities and Transportation Planning
 - Water Supply, Management and Infrastructure
 - Natural Systems
 - Agriculture
 - Energy and Fuel
 - Risk Reduction and Emergency Management
 - Outreach and Public Policy

Austin

- City Council Resolutions [20131121-060](#)¹⁹ and [20140522-048](#)²⁰ direct city staff on climate resilience planning
- [Climate Change Projections for the City of Austin](#)²¹, April 2014, Dr. Katharine Hayhoe author
- [Toward a Climate-Resilient Austin: A report in response to City Council Resolution 20131121-060](#)²², May 1, 2014 report of preliminary identification of climate-related threats and thresholds for key city departments
- [Texas Tribune article](#)²³ about Hayhoe report discusses lack of similar planning in other TX cities or support from state gov't; state water officials do not consider climate change when planning for Texas' water future, no comprehensive studies of the impact on the electric grid

Houston-Galveston

- October 2014 [Regional Climate Change Preparedness Exercise](#)²⁴ sponsored by White House in collaboration with several federal agencies

California Climate Adaptation Strategy²⁵

- In 2009, California adopted a statewide [Climate Adaptation Strategy](#)²⁶ that summarizes climate change impacts and recommends adaptation strategies across seven sectors: Public Health, Biodiversity and Habitat, Oceans and Coastal Resources, Water, Agriculture, Forestry, and Transportation and Energy.

New York City - [PlaNYC 2030](#)²⁷

- 2007: sustainability effort launched, [updates in 2011 and 2013](#)²⁸
- 2011 [chapter on climate change](#)²⁹
- June 2013: [Special Initiative for Rebuilding and Resiliency](#)³⁰ issued after Hurricane Sandy

UK Climate Risk Assessment and Planning

- [Climate Change Risk Assessment \(CCRA\)](#)³¹ contains detailed analysis of over 100 potential climate impacts in 11 key sectors. It's the basis for prioritizing adaptation measures to minimize risks to economy, environment and society in Agriculture and Forestry; Business, Industries and Services; Health and Wellbeing; Natural Environment; and Buildings and Infrastructure.
- [David Ballard describes](#)³² the report's "radically new methodology" (integrally informed)

RESOURCES AND GUIDES FOR A PLANNING PROCESS

[State, Local, and Tribal Leaders Task Force on Climate Preparedness and Resilience](#)³³

- Recommendations of how the federal government can respond to the needs of communities that are dealing with climate change; it offers a seven-theme framework that can be a guide for topics that need to be examined in a local planning process.
- Seven themes:
 - Building Resilient Communities
 - Improving Resilience in the Nation's Infrastructure
 - Ensuring Resilience of Natural Resources
 - Preserving Human Health & Supporting Resilient Populations
 - Supporting Climate-Smart Hazard Mitigation and Disaster Preparedness and Recovery
 - Understanding and Acting on the Economics of Resilience
 - Building Capacity for Resilience

[Rockefeller Foundation 100 Resilient Cities Centennial Challenge](#)³⁴

- Dallas and El Paso are among international cities that receive support to prepare a resilience plan and to hire a Chief Resilience Officer to oversee resilience strategy. Website will be a source for ideas and best practices information. Dallas' Chief Resilience Officer is Theresa O'Donnell.

[ICLEI Climate Resilient Communities \(CRC\)](#)³⁵

- [The Mitigation-Adaptation Connection: Milestones, Synergies and Contradictions](#).³⁶
 - Mitigation and adaptation are complementary strategies – there are examples of mitigation strategies that also make communities more resilient to climate impacts. However, some mitigation strategies work against adaptation goals, and vice versa.
- Similar to its five-step process to address GHG [mitigation](#),³⁷ ICLEI's CRC is a program to address adaptation. Steps are:
 - Conduct local climate resilience study
 - Set preparedness goals
 - Develop a climate preparedness plan and prioritize actions
 - Publish and implement the plan
 - Monitor and reevaluate resilience

[California Adaptation Planning Guide](#)³⁸

- Part of the California Climate Adaptation Strategy, this provides a step-by-step process for local and regional governments interested in climate vulnerability assessment and adaptation strategy development.

[Security and Sustainability Forum](#)³⁹ (SSF)

- A public interest educational organization that convenes global experts in free events to address threats to society from climate and other disruptions to natural systems. See [archived webinars](#).⁴⁰

Other Resources

- [American Society of Adaptation Professionals](#)⁴¹
- [EPA Urban Heat Island Webcasts and Conference Calls](#)⁴²
- [Columbia Law School Sabin Center for Climate Change Law](#)⁴³: Identifies resources by jurisdiction (Federal, State and Local)
- [Progress and Challenges in Urban Climate Adaptation Planning](#),⁴⁴ May 2012 report of MIT & ICLEI, identifies 22 specific climate risks in 7 categories
- [HARC's initiative on resilience](#)⁴⁵
- [National Council on Science and the Environment 13th annual conference Jan. 2013](#)⁴⁶
- [ULI Urban Resilience Program](#)⁴⁷
- Center for Climate and Energy Solutions (C2ES), [adaptation section of website](#).⁴⁸
- [Southern Climate Impacts Planning Program](#)⁴⁹ (SCIPP): Project of NOAA, LSU and OU supporting climate research & information needs of southern states, including TX, OK and LA.
- [North Central Texas Environmental Stewardship Forum](#): Participants are primarily city environmental staff members, with EPA participation. Funding expired in 2013. Dallas, FW, Denton & Plano are continuing it, [Renee Bellew](#) at EPA is lead.
- Vision North Texas: Joint project of UTA, NCTCOG and ULI to evaluate regional growth strategies, 2010 report: [North Texas 2050 gameplan](#)⁵⁰

CLIMATE SCIENCE AND IMPACTS ON TEXAS

U.S. Global Change Research Program: [Global Climate Change Impacts in the United States](#)⁵¹

- 2014 Third National Climate Assessment was released 5/6/14. [Full report](#)⁵² (large file)

Houston Advanced Research Center (HARC)

- [Texas Climate News](#)⁵³
- [Texas Climate Initiative](#):⁵⁴ with Rice, book *Impact of Global Warming on Texas*⁵⁵ (UT Press, 2011)
- [Dallas Urban Heat Island report](#)⁵⁶ for EPA Sustainable Skylines Initiative (2009).

[Intergovernmental Panel on Climate Change](#)⁵⁷

- 5th Assessment report AR5 issued 2013-14

[American Association for the Advancement of Science](#)⁵⁸

- [What We Know: The Reality, Risks and Response to Climate Change](#) (2014)⁵⁹

¹ <http://www.globalchange.gov/>

² NCA overview finding #12, p. 27 of full report,

http://s3.amazonaws.com/nca2014/high/NCA3_Climate_Change_Impacts_in_the_United%20States_HighRes.pdf

³ http://www.whitehouse.gov/sites/default/files/docs/task_force_report_0.pdf

⁴ Id. at page 4

⁵ <http://www.urbanclimate.gatech.edu/>

⁶ *How I Got Religion on Trees*, www.anndrumm.com

⁷ <http://riskybusiness.org/>

⁸ <http://riskybusiness.org/uploads/files/Texas-v2.7.pdf>

⁹ <http://www.whitehouse.gov/sites/default/files/image/president27sclimateactionplan.pdf>

¹⁰ <http://www.whitehouse.gov/the-press-office/2013/11/01/executive-order-preparing-united-states-impacts-climate-change>

¹¹ <http://www.whitehouse.gov/the-press-office/2014/07/16/fact-sheet-taking-action-support-state-local-and-tribal-leaders-they-pre>

¹² <http://www.whitehouse.gov/administration/eop/ceq/initiatives/resilience/taskforce>

¹³ <http://www.whitehouse.gov/blog/2014/03/19/climate-data-initiative-launches-strong-public-and-private-sector-commitments>

¹⁴ <http://epa.gov/climatechange/Downloads/impacts-adaptation/adaptation-statement-2014.pdf>

¹⁵ http://www.whitehouse.gov/sites/default/files/docs/task_force_report_0.pdf

¹⁶ <http://toolkit.climate.gov/>

¹⁷ <http://southeastfloridaclimatecompact.org/>

¹⁸ <http://isc.ksepartners.info/wp-content/uploads/2014/09/regional-climate-action-plan-final-ada-compliant.pdf>

¹⁹ http://www.austintexas.gov/sites/default/files/files/Sustainability/Climate/2013-11-21_Climate_Adaptation_Resolution.pdf

²⁰ <http://www.austintexas.gov/edims/document.cfm?id=210783>

²¹ https://austintexas.gov/sites/default/files/files/Sustainability/atmos_research.pdf

²² http://austintexas.gov/sites/default/files/files/Sustainability/Climate/Toward_a_Climate_Resilient_Austin.pdf

²³ <http://www.texastribune.org/2014/07/28/think-its-hot-austin-get-used-110/>

²⁴ <http://www.globalchange.gov/browse/reports/regional-climate-preparedness-and-resilience-exercise-series-houston>

²⁵ <http://www.climatechange.ca.gov/adaptation/strategy/>

²⁶ http://resources.ca.gov/climate_adaptation/docs/Statewide_Adaptation_Strategy.pdf

²⁷ <http://www.nyc.gov/html/planyc2030/html/home/home.shtml>

28 <http://www.nyc.gov/html/planyc2030/html/publications/publications.shtml>

29 <http://www.nyc.gov/html/planyc2030/html/theplan/climate-change.shtml>

30 <http://www.nyc.gov/html/sirr/html/report/report.shtml>

31 <https://www.gov.uk/government/publications/uk-climate-change-risk-assessment-government-report>

32 <https://www.integrallife.com/integral-post/new-uk-government-publications-integral-approach-climate-change>

33 http://www.whitehouse.gov/sites/default/files/docs/task_force_report_0.pdf

34 <http://100resilientcities.rockefellerfoundation.org/>

35 http://www.icleiusa.org/climate_and_energy/Climate_Adaptation_Guidance/climate-resilient-communities-program

36 http://www.icleiusa.org/climate_and_energy/Climate_Adaptation_Guidance/free-climate-adaptation-resources

37 http://www.icleiusa.org/climate_and_energy/climate_mitigation_guidance

38 http://resources.ca.gov/climate_adaptation/local_government/adaptation_policy_guide.html

39 <http://securityandsustainabilityforum.org/>

40 <http://securityandsustainabilityforum.org/archives/webinars>

41 <https://adaptationprofessionals.org/>

42 <http://www.epa.gov/heatisland/resources/webcasts.htm>

43 <http://web.law.columbia.edu/climate-change>

44 <http://web.mit.edu/jcarmin/www/carmin/Urban%20Adaptation%20Report%20FINAL.pdf>

45 http://www.harc.edu/feature/Preparing_for_climate_impacts_HARC_readies_an_initiative_on_resilience

46 <http://www.environmentaldisasters.net/topics/view/81252/>

47 <http://uli.org/research/centers-initiatives/urban-resilience-program/>

48 <http://www.c2es.org/science-impacts/adaptation>

49 <http://www.southernclimate.org/>

50 http://www.visionnorthtexas.org/regional_summit/North_Texas_2050.pdf

51 <http://www.globalchange.gov/>

52

http://s3.amazonaws.com/nca2014/high/NCA3_Climate_Change_Impacts_in_the_United%20States_HighRes.pdf

53 <http://texasclimatenews.org/wp/>

54 <http://texasclimate.org/Default.aspx>

55 <http://texasclimate.org/Home/ImpactofGlobalWarmingonTexas/tabid/481/Default.aspx>

56 http://www.visionnorthtexas.org/NTAF/Documents/Dallas_Urban_Heat_Island_Report.pdf

57 <http://www.ipcc.ch/index.htm#.UIMsZxDheD4>

58 <http://www.aaas.org/>

59 <http://whatweknow.aaas.org/>