

# Integrating Climate Futures into Central New Mexico Transportation Planning

Project Overview

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**Federal Remediation Technologies Roundtable – Fall Meeting**

November 15, 2021

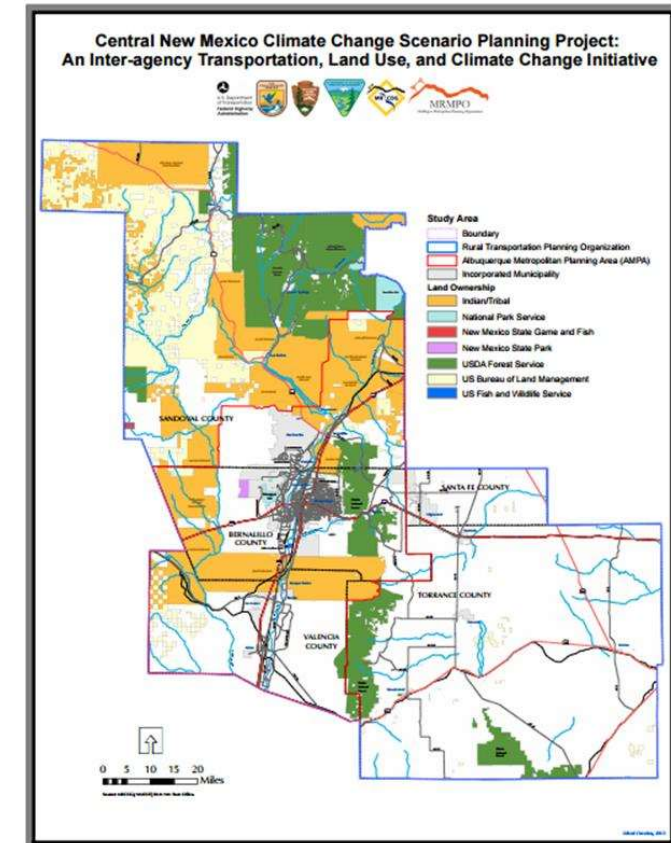
# Climate Change Scenario Planning Projects

- Purpose

- Focus: 50% adaptation and 50% mitigation
- Uses scenario planning as a framework
- Integrates into long range transportation plans
- Involves multiple agencies with different priorities; not just transportation

- Two locations

- Coast: pilot project on Cape Cod, Massachusetts (2010-11)
- Non-coastal: Central New Mexico (2013-15)



# CCSP Goals

- Identify:
  - Regional climate change impacts
  - The effect of these impacts on transportation, land use, and natural resources
  - The effect of transportation and land use policy choices on climate change impacts
- Example adaptation strategies:
  - Increased densities in areas at less risk
  - Buffers around high risk areas

*How will these strategies be affected by climate change impacts?*

*How will these strategies improve or reduce resiliency?*



# CCSP Partnerships

- Federal funding sponsors



- Supporting federal agencies



- Regional and local agencies / governments



- Private and academic entities



# Developing Climate Futures

Variables
Precipitation (mm/day)
Maximum daily temperature (°C)
Minimum daily temperature (°C)
Average daily temperature (°C)— <i>derived by averaging max &amp; min</i>
Average daily wind speed

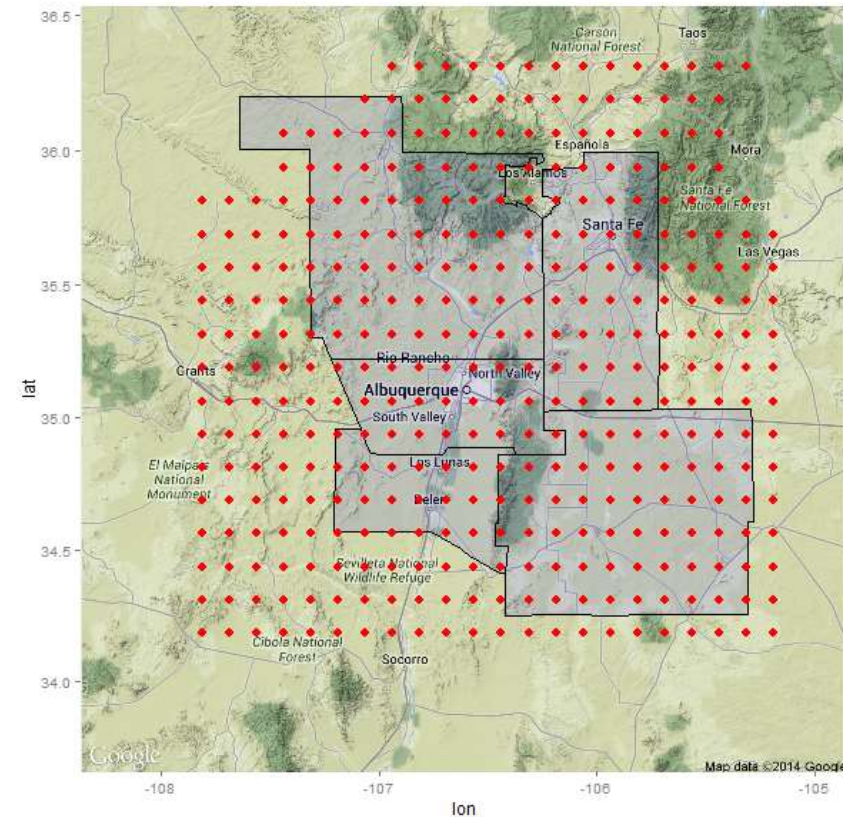
  

Projections Range
1950-2099

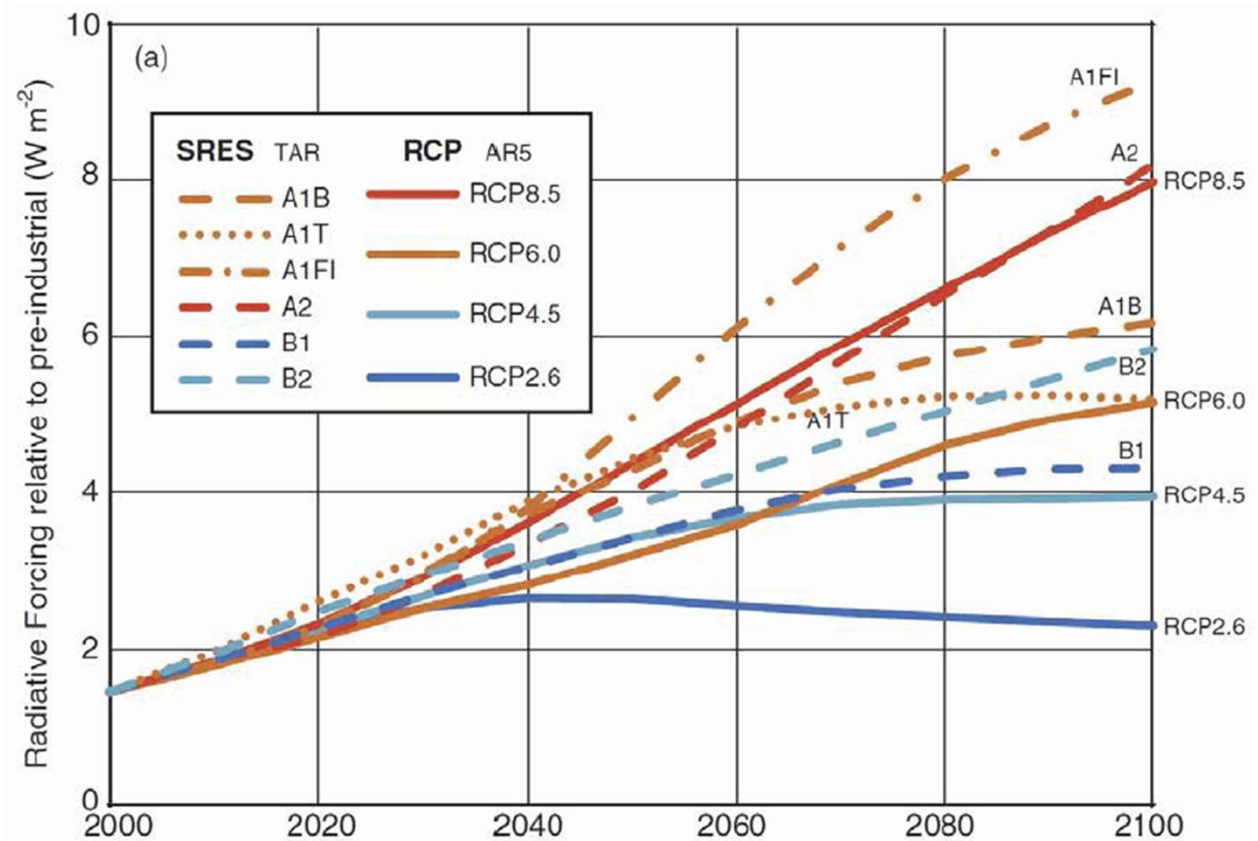
- Downscaled (fine spatial resolution translations) of CMIP3 climate projections
- Based on 112 model runs: 9 models, 3 emissions scenarios
- Supplied by Bureau of Reclamation Technical Services Center

# Developing Climate Futures

- 369 grid cells with 1/8<sup>th</sup> degree downscaled CMIP3 climate projections
- Any year up to 2099 can be selected for analysis with desired range/average
  - Analyses used these inputs:
    - Baseline period is 1950-1999
    - Future period is 2025-2055 ( $\pm 15$  years around 2040)
  - And produced these outputs:
    - Change in Average Monthly Max and Min Temperatures
    - Change in Average Monthly Precipitation
    - Maximum Consecutive and Total Days  $> 100^{\circ}\text{F}$
    - Maximum 24-hour Precipitation
    - Maximum Drought Length (Consecutive Days w/ No Precipitation)



# Emission Scenarios

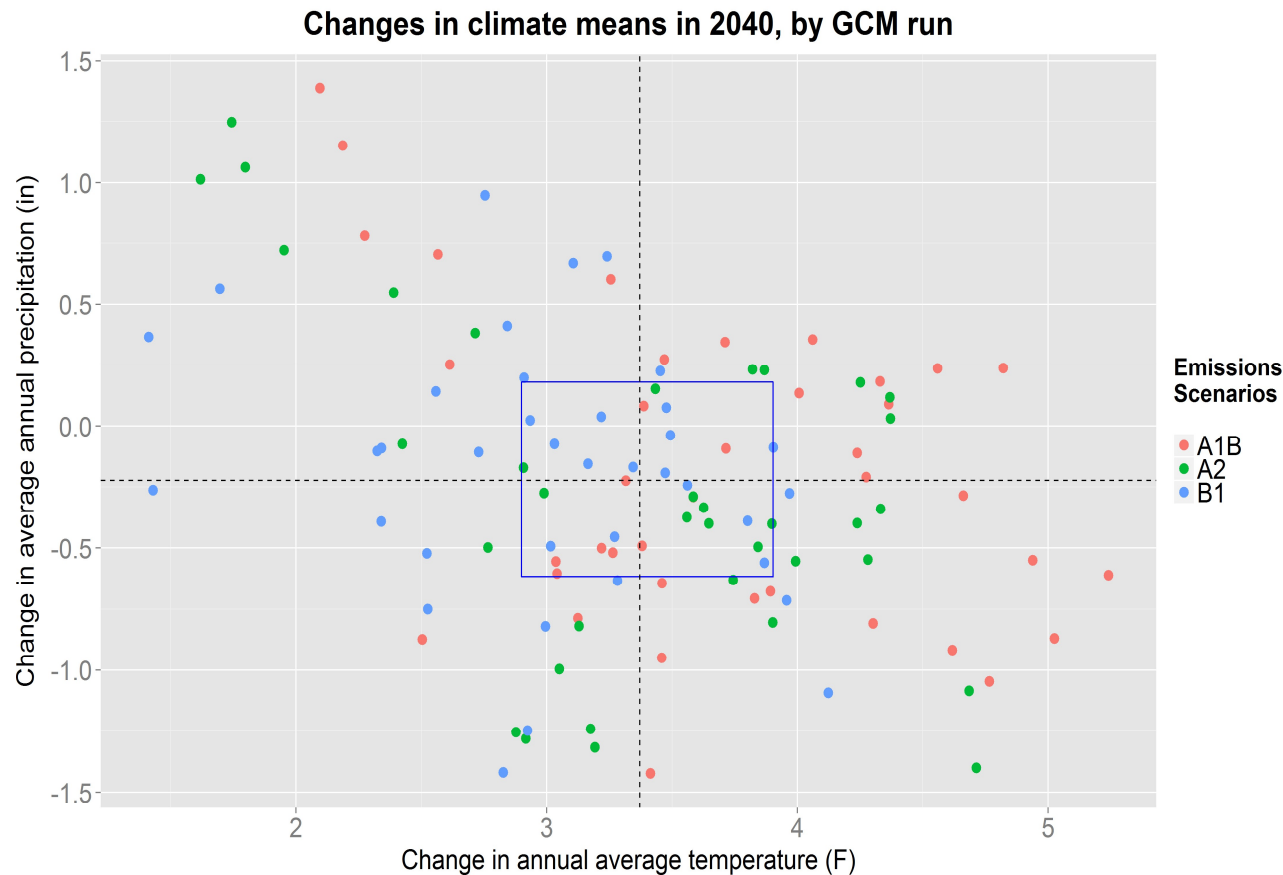


**CMIP3**  
A2: high  
A1B: medium  
B1: low

Note: A1B  
and A2 cross  
in 2060

# Developing Climate Futures

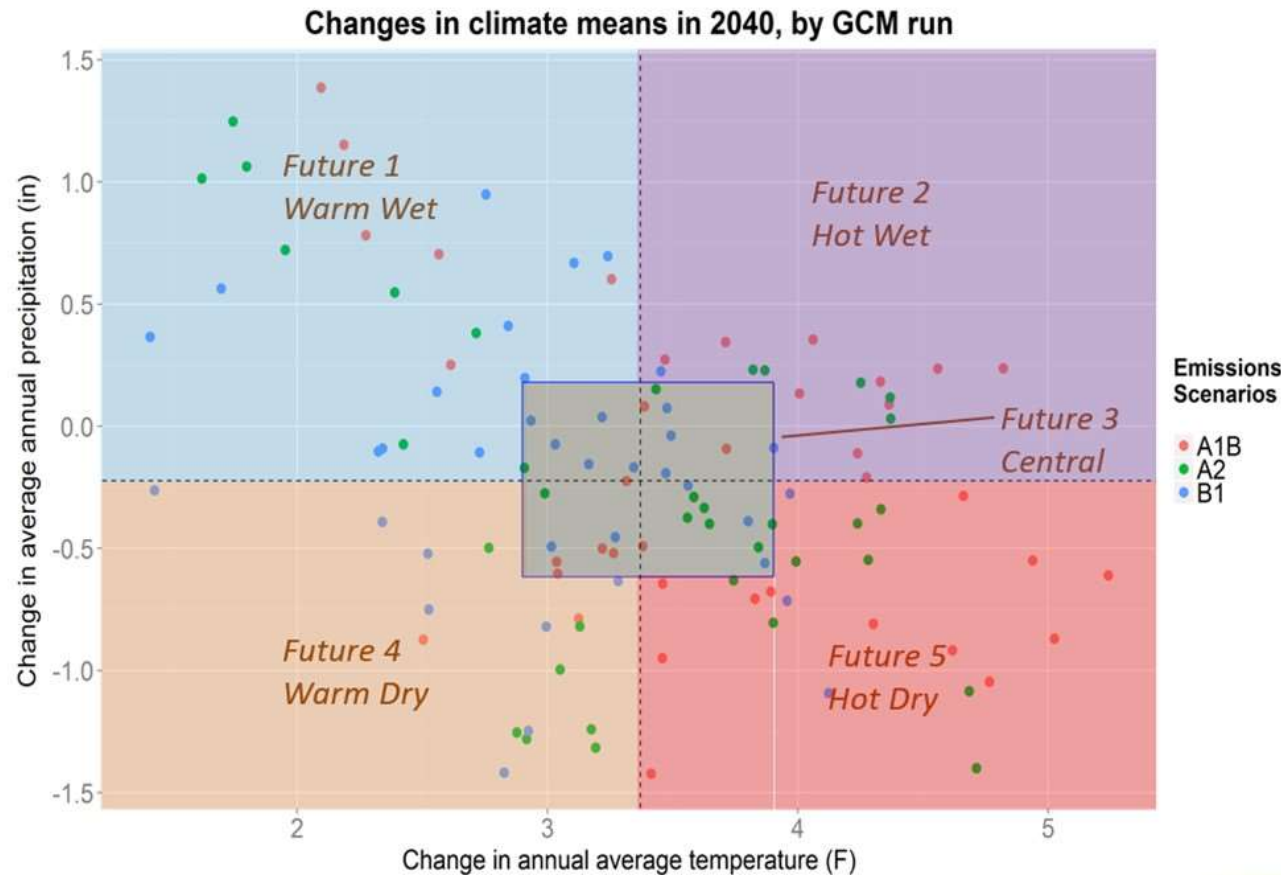
- Changes in annual climate averages for all GCMs at selected grid cell in selected year from 20th century baseline (1950-1999)



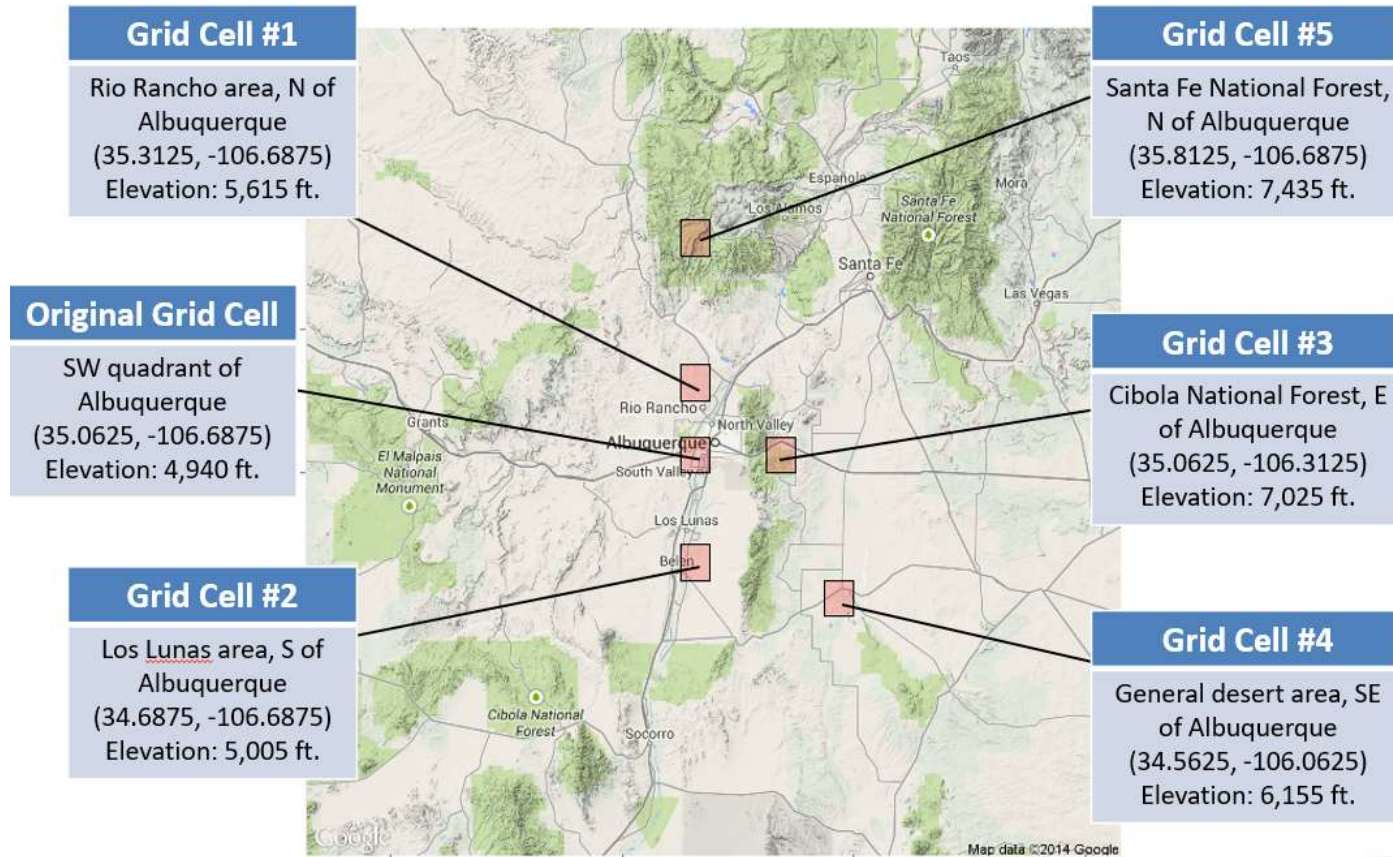


# Developing Climate Futures

- Changes in annual climate averages for all GCMs at selected grid cell in selected year from 20th century baseline (1950-1999)

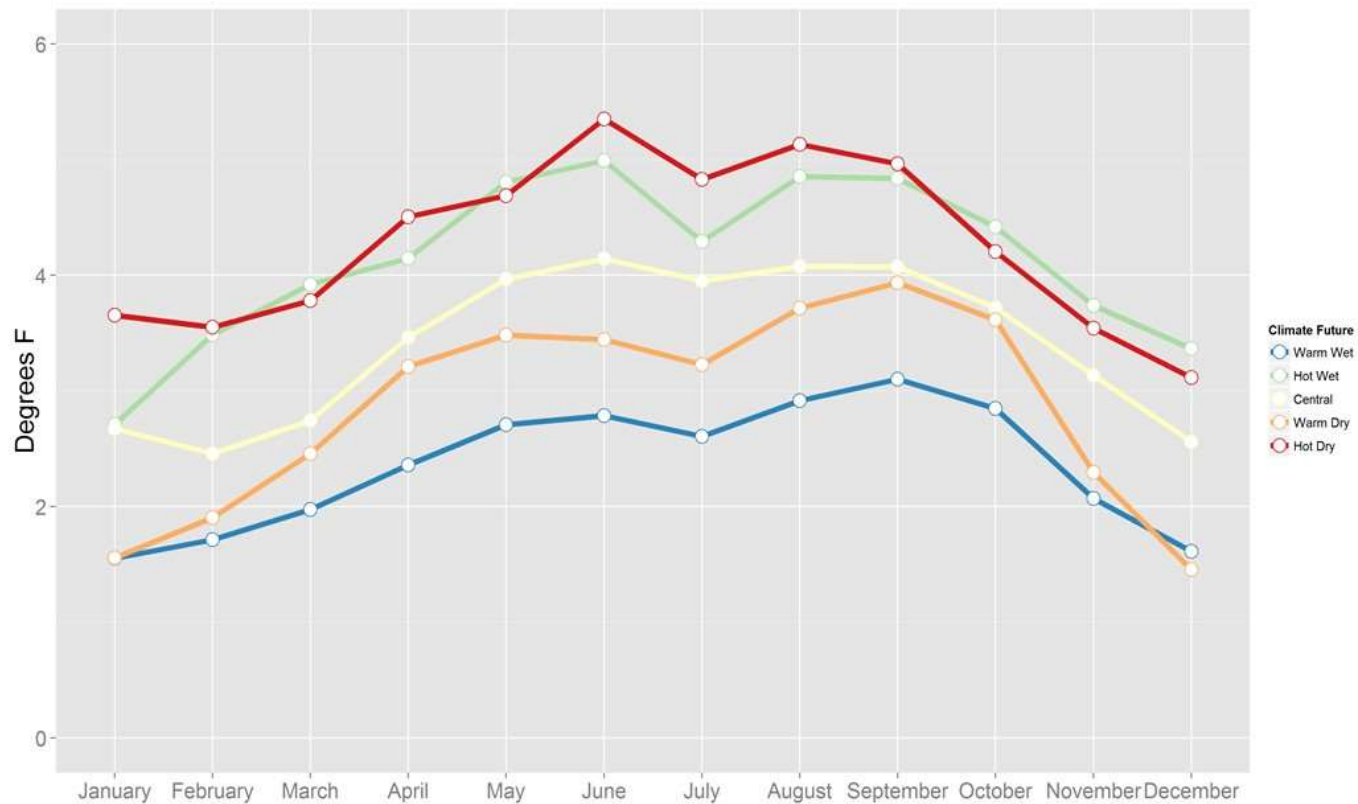


# Grid Cells of Interest



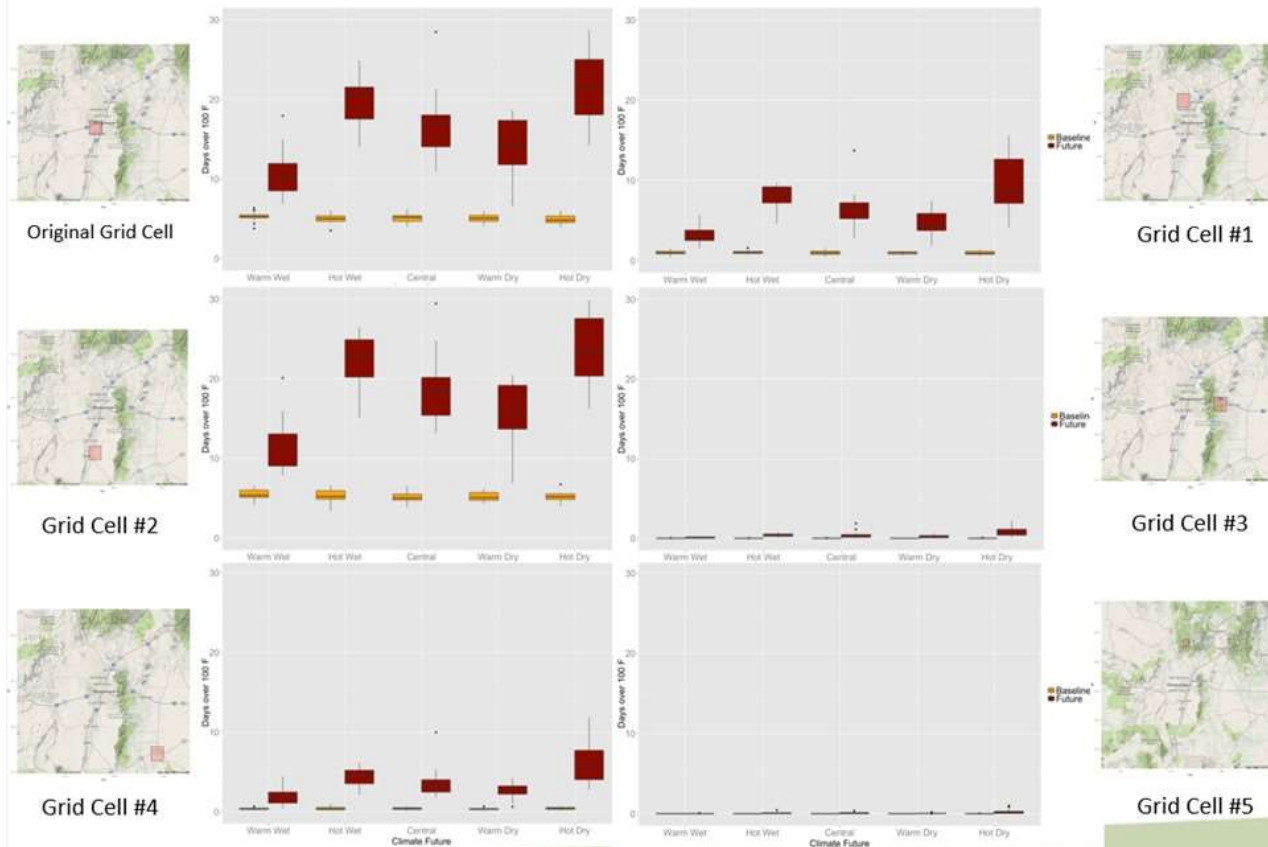
# Climate Futures Results

Change in Average Daily Maximum Temperature in 2040 (2025-2055) vs. 1950-1999



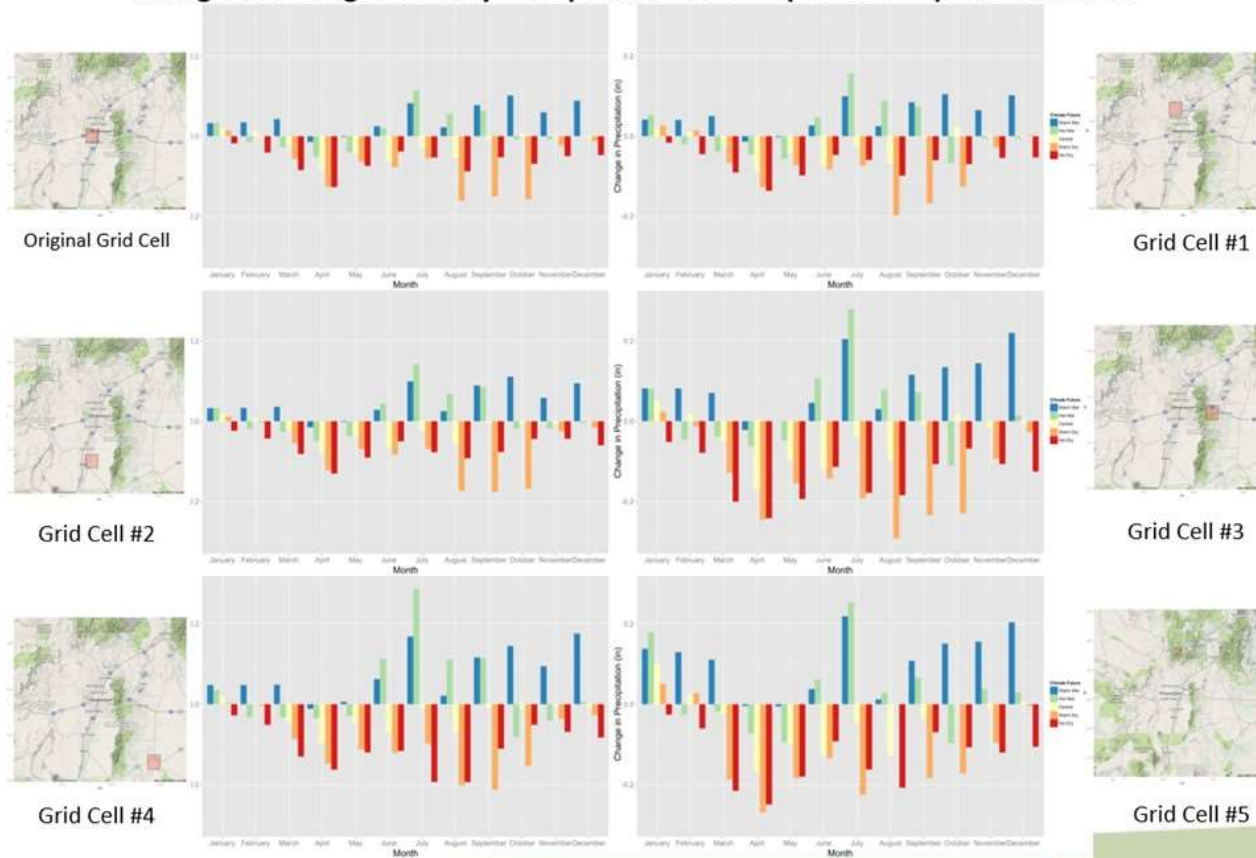
# Climate Futures Results

Total Days Over 100°F in Baseline (1950-1999) and 2040 (2025-2055 average)

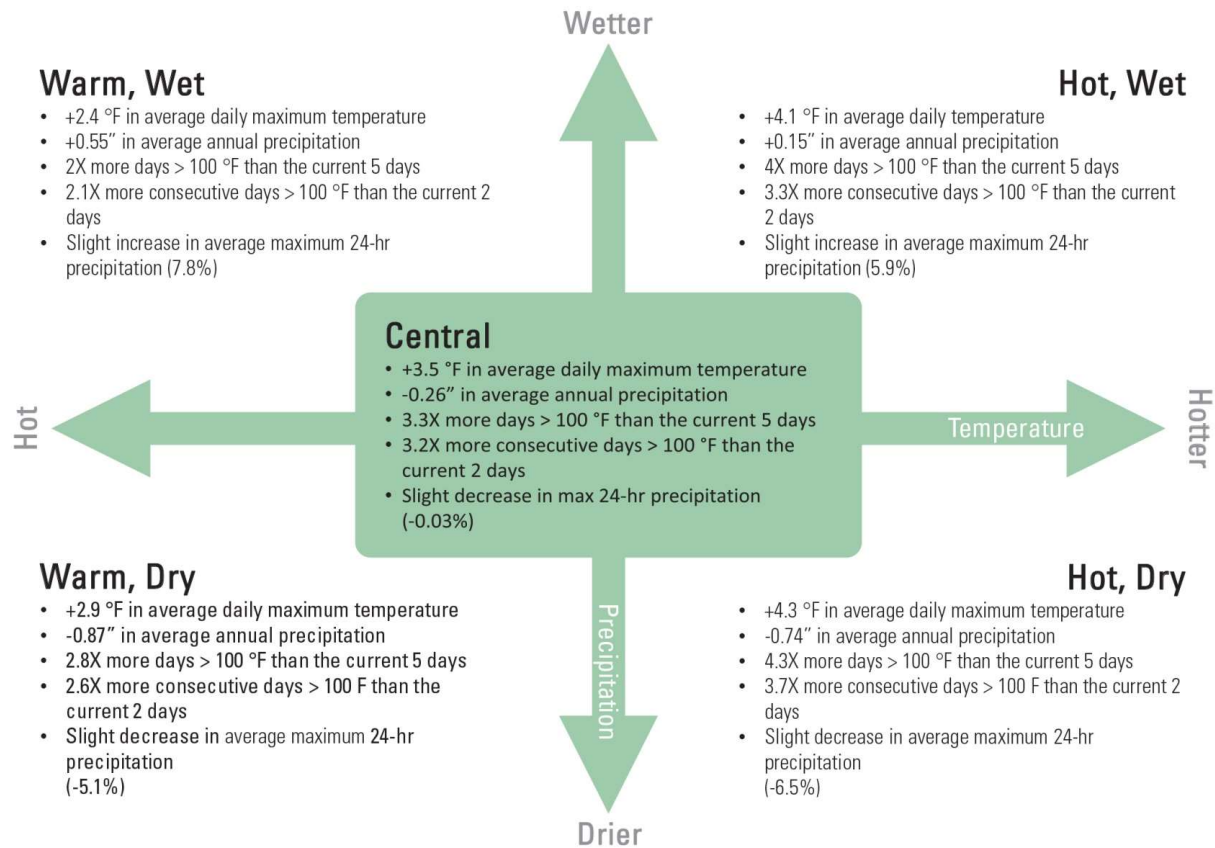


# Climate Futures Results

Change in Average Monthly Precipitation in 2040 (2025-2055) vs. 1950-1999



# Climate Futures Results



# Climate Futures Results

- Informed:
  - Where existing development is at risk
  - Where future development should be minimal
  - Energy: increase in cooling degree days
  - Impacts for natural and cultural resources
    - Riparian habitats
    - T&E species



*Downtown Albuquerque, August 2014  
Credit: Roberto Rosales*

# More Information

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- More information:

- <https://www.volpe.dot.gov/transportation-planning/public-lands/central-new-mexico-climate-change-scenario-planning-project>

Integrating Climate Change in Transportation and Land Use Scenario Planning  
An Example from Central New Mexico

14/2015

April 2015  
DOT-VNTSC-BA-15-01

Prepared for:  
Federal Highway Administration  
U.S. Fish and Wildlife Service  
Bureau of Land Management

U.S. Department of Transportation  
2014 U.S. Federal Highway Administration  
Volpe

14/2015

## Central New Mexico Climate Change Scenario Planning Project

Final Report

Integration Plan for the Mid-Region Council of Governments: Central New Mexico Climate Change Scenario Planning Project  
June 30, 2015

**Introduction**  
The Central New Mexico Climate Change Scenario Planning Project (CCSP) is a multi-agency collaboration to research the potential impacts of climate change on the Central New Mexico region's land use, development and transportation system to inform regional planning. As part of the CCSP, the project team analyzed strategies that the region could take to adapt to climate change, increase its resilience, and mitigate greenhouse gas (GHG) emissions. As part of the CCSP, the Mid-Region Council of Governments (MRCOG), the transportation planning organization for the Albuquerque Metropolitan Planning Area, used the CCSP team's analysis of potential future climate change impacts to evaluate the relative feasibility of its land use and transportation planning scenarios for its metropolitan transportation plan (MTP), the Future 2060 MTP.<sup>1</sup>

The purpose of this Integration Plan is to provide useful information on strategies that MRCOG and its partners can pursue over the next few years to adopt regional policies, programs, and data collection procedures to further the goals of environmental protection, climate change mitigation, climate change adaptation, and resilience. These strategies will help MRCOG further integrate those goals into its next MTP.

This Integration Plan identifies potential implementation strategies for the following policy focus areas for each focus area. The Plan provides examples of similar policies and programs in other regions, as well as recommendations for the role that MRCOG could play in supporting these implementation strategies.

- **Transportation Climate Change Adaptation Resilience:** Identifies strategies to help existing data gaps to better understand present and potential future flood, heat, and wildfire vulnerability for the region's transportation assets.
- **Mitigating GHG Emissions from Transportation:** Identifies two primary strategies for reducing GHG emissions from transportation facilities – retrofitting strategies to light emitting diodes (LED) technology and installing renewable energy generation facilities at transportation rights-of-way.
- **Integrating Climate Change into Activity Centers:** Analyzes land use and transportation strategies to support the development of "activity centers" with concentrated development near transit.
- **Regional Support to Travel Demand Management:** Analyzes potential regional strategies the region could adopt to use travel demand management (TDM) to incentivize reductions in vehicle miles traveled.
- **Open Space, Transportation Programs and Policies:** Identifies several potential strategies for preserving regional open space to increase resilience to flooding and wildfire and protect important critical habitat areas.

<http://www.volpe.dot.gov/transportation-planning/public-lands/central-new-mexico-climate-change-scenario-planning-project>

U.S. Department of Transportation  
2014 U.S. Federal Highway Administration  
Volpe

## Potential Climate Change Impacts and the BLM Rio Puerco Field Office's Transportation System: A Technical Report

Prepared for the Bureau of Land Management's Rio Puerco Field Office, New Mexico

Erica Simmons, Paige Cohen, Alexander Epstein, Benjamin Rasmussen

March 2015  
DOT-VNTSC-BA-15-01

Prepared for:  
Bureau of Land Management  
Rio Puerco Field Office  
Albuquerque, New Mexico

U.S. Department of Transportation  
2014 U.S. Federal Highway Administration  
Volpe

U.S. Fish & Wildlife Service

## Preparing for a Changing Climate

Valle de Oro National Wildlife Refuge

**About the Refuge**  
Valle de Oro National Wildlife Refuge is the Southwest's first urban wildlife refuge and the first U.S. Fish and Wildlife Service refuge developed in partnership with the private sector. The refuge is a 1,000-acre urban wildlife refuge in Albuquerque, New Mexico, that provides a natural habitat for several species of birds, mammals, and reptiles. The refuge is also a popular destination for birdwatching and nature photography.

**Preparing for Climate Change in Central New Mexico**  
A recent U.S. Federal Science Assessment report (USFSA) indicates that a changing climate will affect the natural resources and the people who depend on them. The report identifies several key areas where climate change is likely to have significant impacts, including water resources, agriculture, and human health. The report also identifies several key areas where climate change is likely to have significant impacts, including water resources, agriculture, and human health.

**How Might Climate Change Affect Central New Mexico?**  
The USFSA report identifies several key areas where climate change is likely to have significant impacts, including water resources, agriculture, and human health. The report also identifies several key areas where climate change is likely to have significant impacts, including water resources, agriculture, and human health.

U.S. Fish and Wildlife Service  
2014 U.S. Federal Wildlife Service  
Volpe