

# The Climate and Water Consortium

*Where Theory and Science Meet the Real World*

Interdisciplinary, innovative problem-solving center (physics, atmospheric physics, engineering, hydrology, geophysics, biology, chemistry, applied math, economics, management, computer science, and education)

The long term goal is to improve the New Mexico and south-western economies and industry (agriculture, ranching, forestry, renewable energy, health) in particular when it comes to climate assessments and water management

# The Climate and Water Consortium Research

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- Research in weather and climate
- Improving forecast and climate models with better treatment of convection (OTREC, CPEX)
- Research on climate and weather effects on local ecosystem and in particular on economy, agriculture (extreme events such as droughts and floods)
- Research in hydrological processes and modeling (groundwater, irrigation)
- Renewable energy (solar and wind)
- Research projects using solar induced fluorescence data and remote-sensing data on land/vegetation cover
- Research in evaluating native plant restoration and the biogeochemistry/climate effects that serve as controls.
- Research on different scenarios and their impact on the economy and society
- Proposed solutions, advising policy makers

# The Climate and Water Consortium

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To be able to provide better weather forecasts and assessments of the climate change and its influence on our ecosystem and therefore our economy, we need to have more **measurements and data**.



Surface weather station data - note the sparse distribution of stations in the southwest compared to the east coast

# The Climate and Water Consortium Instruments

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**Instruments** that Consortium proposes to place in the southwest to improve the weather forecasts, climate assessments and their impact on our ecosystem, economy and health:

- standardized surface weather stations linked to the forecasting network
- sounding (upper air vertical profiles)
- GPS precipitable water
- LIDAR (winds)
- scintillometers (sensible heat fluxes)
- soil moisture sensors
- groundwater level monitoring

# The Cost of Climate Change for NM

**Figure 1. Potential Economic Costs in New Mexico Under a Business-as-Usual Approach to Climate Change, 2020, 2040, and 2080 (dollars per year)**

Potential Cost	2020	2040	2080
<b>Costs of Climate Change</b>			
Increased Energy-Related Costs	\$248 million	\$647 million	\$2.6 billion
Reduced Trout Populations	\$38 million	\$46 million	\$61 million
Increased Flood and Storm Damage	\$88 million	\$181 million	\$435 million
Reduced Food and Agricultural Production	\$73 million	\$129 million	\$382 million
Increased Wildland Fire Costs	\$488 million	\$1.0 billion	\$2.2 billion
Increased Health-Related Costs	\$421 million	\$759 million	\$1.6 billion
Lost Recreation Opportunities	\$286 million	\$563 million	\$812 million
Reduced Streamflows	\$8 million	\$11 million	\$21 million
<i>Subtotal for Costs of Climate Change</i>	<i>\$1.7 billion</i>	<i>\$3.4 billion</i>	<i>\$8.2 billion</i>
<b>Additional Costs from Business-as-Usual (BAU) Activities that Contribute to Climate Change</b>			
Inefficient Consumption of Energy	\$1.3 billion	\$2.4 billion	\$8.3 billion
Increased Health Costs from Coal-Fired Emissions	\$275 million	\$527 million	\$1.9 billion
<i>Subtotal for Costs from BAU Activities</i>	<i>\$1.5 billion</i>	<i>\$2.9 billion</i>	<i>\$10.2 billion</i>
<b>TOTAL</b>	<b>\$3.2 billion</b>	<b>\$6.3 billion</b>	<b>\$18.4 billion</b>
Average Cost per Household per Year	\$3,430	\$5,410	\$12,000

Source: ECONorthwest.

Notes: These numbers illustrate different types of annual costs New Mexicans potentially would incur if society were to continue with a business-as-usual approach to climate change. There may be overlap between the values for some of the different types of costs. Nonetheless, adding the different types of costs probably seriously understates the total potential cost of climate change because the table excludes many additional types of climate-related costs that New Mexicans would incur under a business-as-usual approach. The numbers do not indicate the net effect of climate change, as they do not represent a forecast of how the economy will respond to the different effects of climate change, or account for potential economic benefits that might materialize from moderate warming and other changes in climate.