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Some Climate Change Implications for the Navajo Nation

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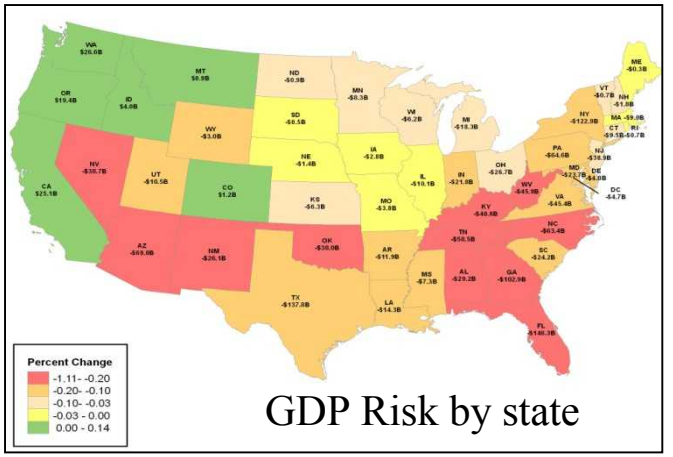
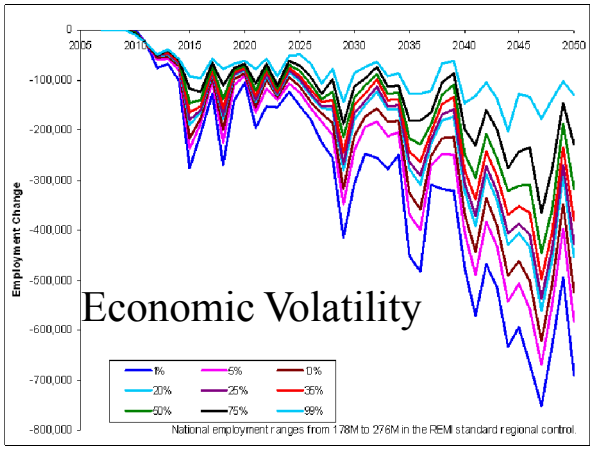
SNL National Climate Risk Assessment Study

- Only covers water-availability for 2010-2050
- Covers all economic sectors and employment
- Covers interactions across all states and businesses.
- Emphasizes uncertainty to determine risks beyond the “best estimate.”
- Volatility brings the future transiently into the present.



GDP Risk by state



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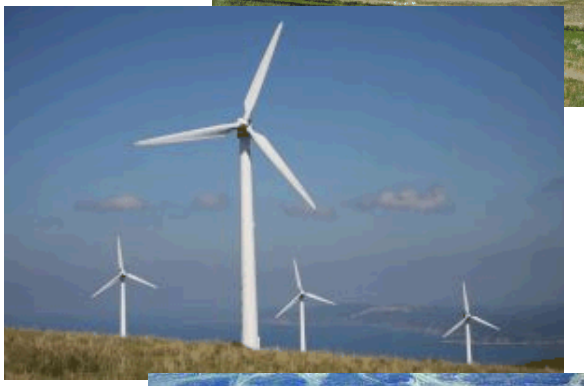
Navajo Land Impacts: Arizona

- **Sylvan-Biofuel: Droughts will increase fire frequency and magnitude.**
- **Wind Farms: Climate change will cause increased winds but possible with increased volatility. Lower gas prices may dominate usage.**
- **Coal: Climate-induced, losses of hydropower will cause increased coal use in some states, but new (unconventional) natural-gas supplies will dominate market impacts.**



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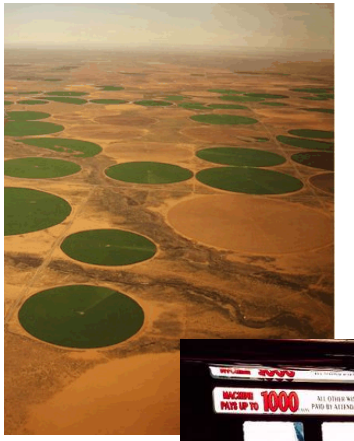
Navajo Land Impacts: New Mexico and Utah

- **New Mexico**
  - NAPI: Drought conditions will become more frequent, but dam should mitigate expected transient, but there may be tradeoffs between agriculture and electric production for approximately 10% of the years.
  - Casinos: Out-migration and lower incomes, could negatively affect casino operations.
- **Utah:**
  - Utah Dine Corporation: Climate impact on support industries could modestly increase costs of oil production/transport.



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Quantification of Impacts

The values below are based on applying the state-level impacts to Navajo interests.

- **General: Through 2050, the average 10% reduction in water availability due to climate change averages to 0.3% reduction in GDP. Volatile years can be 10X worse. Impacts triple between 2030 and 2050, and accelerate thereafter.**
- **Agriculture: Agriculture will have a 10% and 20% reduction in productivity due to heat and water conditions.**
- **Hydropower: By 2050, generation could be reduced to 80% to 50% of 2010 levels**
- **Mining: Extraction requiring water could have 20% to 50% reduction in output capacity by 2050.**

Backus et. al., "Assessing the Near-Term Risk of Climate Uncertainty: Interdependencies among the U.S. States," SAND Report, April 2010. https://cfwebprod.sandia.gov/cfdocs/CCIM/docs/Climate_Risk_Assessment.pdf

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