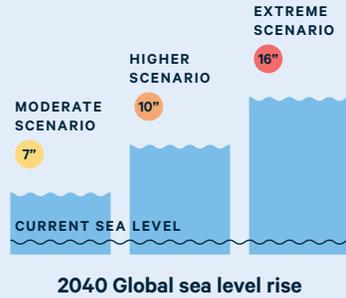


Understanding Sea Level Rise in Florida, 2040

Global sea level rise scenarios reveal an uncertain future

Future sea level depends on greenhouse gas emissions and atmospheric / oceanic processes. Moderate and higher scenarios represent a plausible range, while the extreme scenario is very unlikely, but still possible (<1% likelihood).



Sea levels are projected to rise faster in Florida than the global average

By 2100, large swaths of coastal land in Florida will be permanently submerged. In the shorter term, rising seas will increase the frequency and severity of coastal flooding. Statewide, three feet of flooding puts at risk:

- 490,000 People
- 300,000 Homes
- 2,500 Miles of Road
- 372 Waste Sites
- 30 Schools
- 4 Hospitals

Map Legend

Sea level rise and annual flood risk by 2040 (in inches and %)

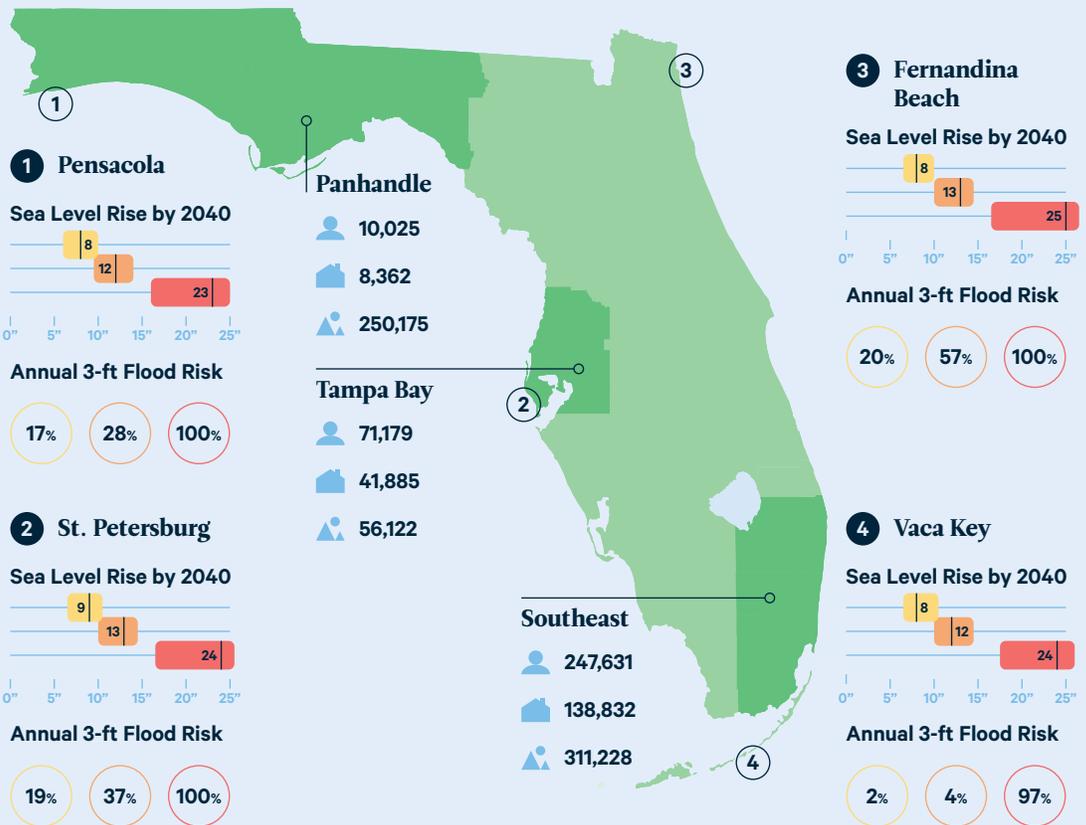
For sea level rise, projection ranges are depicted with the median value shown.

- MODERATE SCENARIO
- HIGHER SCENARIO
- EXTREME SCENARIO

Areas at risk below 3ft

For the darker sections on the map, the following risk areas have been calculated:

- PEOPLE
- HOMES
- LAND (ACRES)

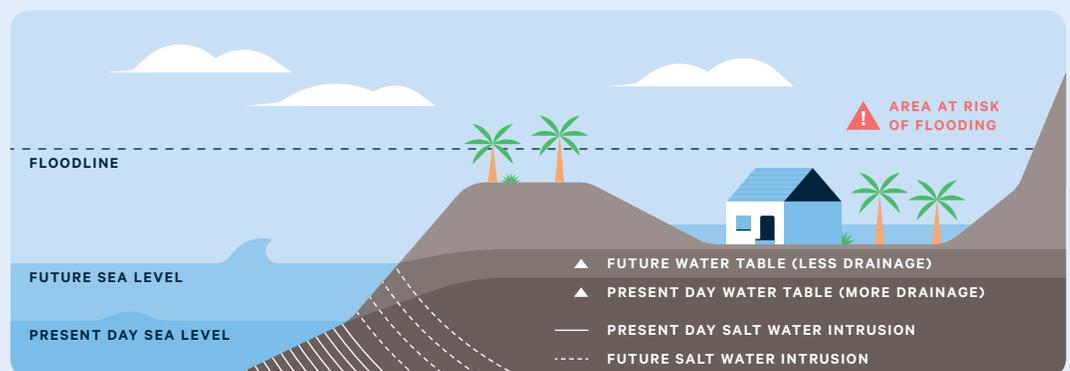


Saltwater Intrusion

Higher sea levels lead to greater salt water intrusion, posing a contamination threat to drinking water and agriculture, as well as natural landscapes.

Flooding

Higher sea levels indirectly increase the severity of flooding by raising the groundwater level and decreasing the capacity of soil to help with drainage, resulting in flood waters remaining higher for longer periods of time.

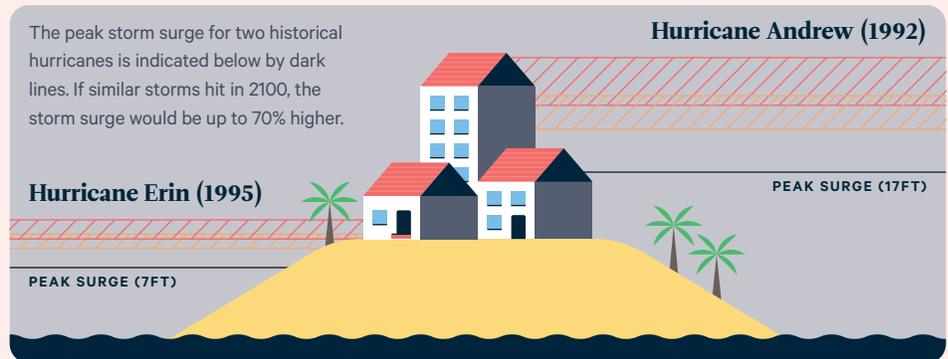


Effects of Climate Change on Storms in Florida

More than any other US state, Florida is susceptible to damages from tropical storms

By 2100, rising seas and more intense storms will increase storm surge by 25-47% under a moderate emissions scenario, and by 40-70% under a higher emissions scenario.

MODERATE SCENARIO HIGHER SCENARIO

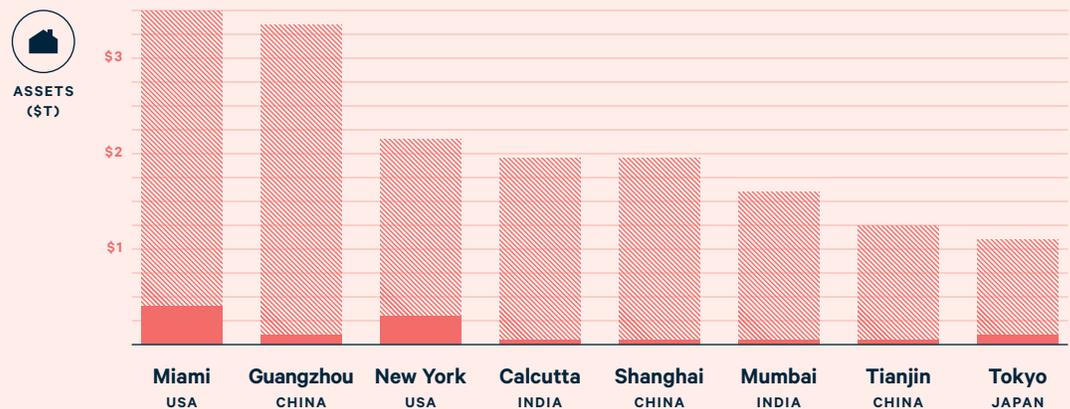


Miami is one of the world's most at-risk cities from coastal flooding

By one measure, it faces the largest risk of any major coastal city, with \$400 billion in assets at risk as of 2005, growing to \$3.5 trillion by the 2070s.

Legend

CURRENTLY EXPOSED (2005) FUTURE EXPOSURE (2070s)



Florida cities are investing to protect against the risks ahead

- 1 Beach Nourishment**
Fortifying existing beaches can help protect low-lying coastal property.
- 2 Building Protective Barriers**
In some cases, hard barriers such as sea walls may be needed.
- 3 Raising Infrastructure**
Some buildings, roads, and other infrastructure will need to be raised.
- 4 Restoring Natural Habitats**
Wetlands and other coastal ecosystems provide natural protection.



These protections won't prevent all damages



Population displacement

The high cost of protection in some areas, like parts of Tampa Bay, suggest the most economically rational option will be to abandon substantial areas of inhabited land.



Other severe weather

Scientists are currently unsure whether climate change will increase the frequency or severity of storms that produce damaging hail or tornadoes.

Effects of Climate Change on Human Mortality in Florida

Extreme heat and cold are both factors that can directly increase mortality

Extreme temperatures lead to physiological responses (e.g., increased heart rate) that can endanger well-being through cardiovascular, cerebrovascular, and respiratory pathways. Studies consistently find higher mortality rates at very high and very low temperatures.

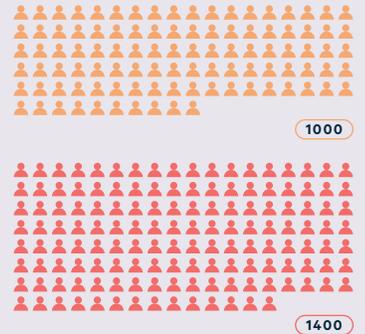


Climate change is projected to increase mortality across Florida

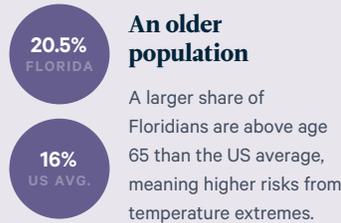
By 2035, median estimates under moderate and high emissions scenarios are an increase in statewide mortality of 1,000 and 1,400, respectively, mostly affecting those older than 65.

REPRESENTS 10 PEOPLE MODERATE SCENARIO HIGHER SCENARIO

Annual Additional Deaths by 2035



Other factors are likely to increase mortality risk in Florida



Map Legend

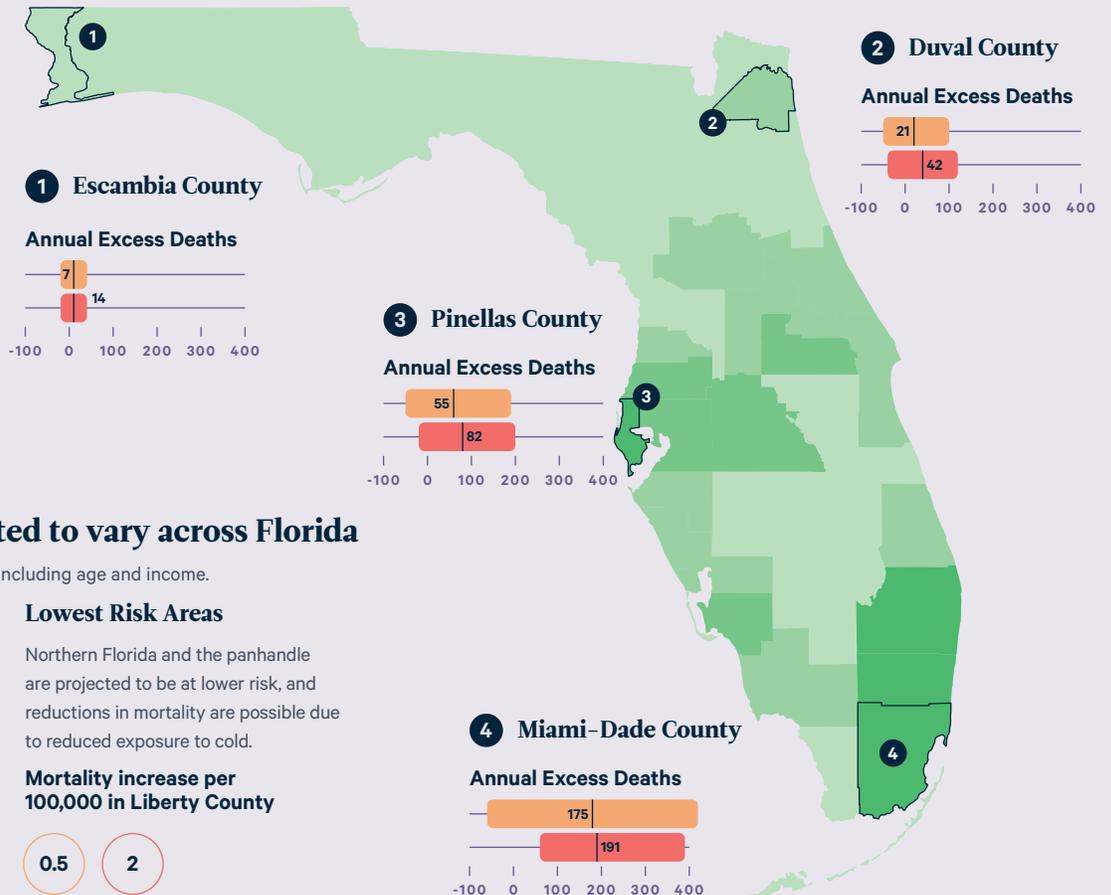
Annual Mortality Estimates by 2035

Bars show 90% confidence range, while numbers show the median estimate.

● MODERATE SCENARIO
● HIGHER SCENARIO

Per County within Moderate Scenario

0-10	31-50
11-30	50+



Mortality risk is projected to vary across Florida

A variety of factors affect mortality risk, including age and income.

Highest Risk Areas

Southern Florida is projected to be most at-risk. Martin, Palm Beach, and several other counties face a similar increase in mortality risk.

Mortality increase per 100,000 in Charlotte County



Lowest Risk Areas

Northern Florida and the panhandle are projected to be at lower risk, and reductions in mortality are possible due to reduced exposure to cold.

Mortality increase per 100,000 in Liberty County



Effects of Climate Change on Agriculture in Florida

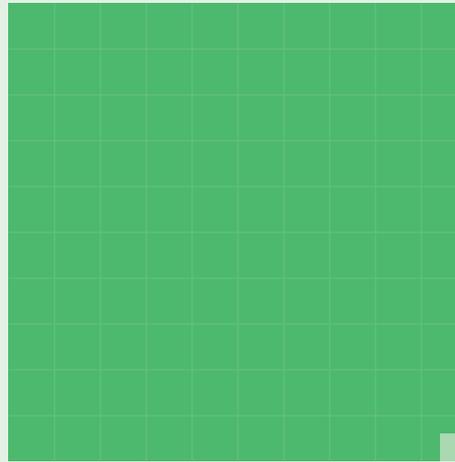
Florida is a major citrus producer, but agriculture is a small part of the state's economy

Florida produces more than half of all US oranges and grapefruits, but agriculture accounts for just 0.6 percent of state GDP in 2017.

0.2% The sector employs just a small percent of Florida's workforce.

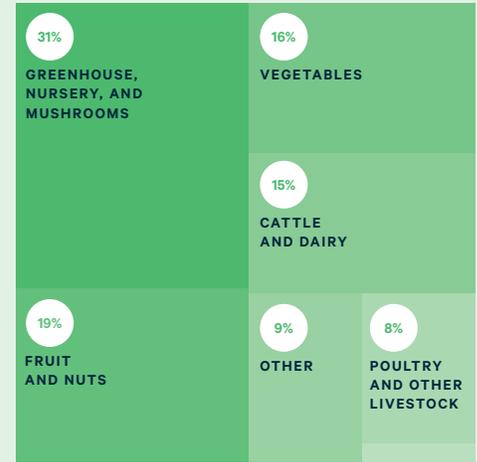
\$25k Workers are paid well below the state average of \$46,000 per year.

Florida's Economy



AGRICULTURE MAKES UP ONLY 0.6% ▲

Florida's Agricultural Economy



SUMS MAY NOT TOTAL DUE TO ROUNDING GRAINS / 1% ▲

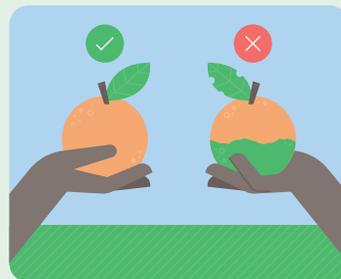
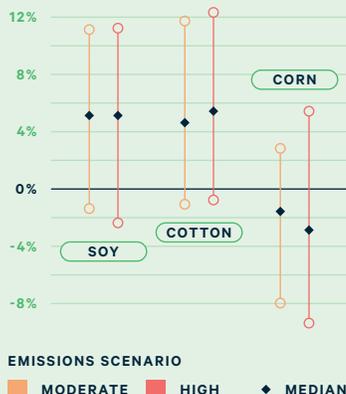
Four major impacts of climate change on Florida agriculture



Staple crops may benefit somewhat from climate change in Florida

Cotton and soy yields increase by 5–6 percent, and grains increase by 1.5–3 percent under moderate and high scenarios, but with large uncertainty.

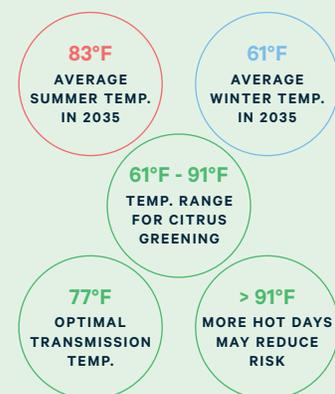
Projected effects of climate change on crop yields by 2035



Citrus greening poses a threat to Florida's iconic agricultural products

Climate change will affect the risks of citrus greening, making transmission more likely in the winter but less likely during hot days in the summer.

Citrus greening transmission in a changing climate



Outdoor farmworkers in Florida face challenging working conditions

Under a moderate emissions scenario, labor productivity for outdoor workers decreases by 17 percent per worker, but there is substantial uncertainty.

Climate impacts range from slightly positive to very negative



Increased heat and drought across Florida are projected to have negative effects

Increased frequency and severity of drought will exacerbate water stress. Higher temperatures will reduce livestock output and breeding productivity.

Florida agriculture relies heavily on irrigation



Impacts of Federal Climate Policies on Florida Households

Legislators are turning to carbon pricing plans to reduce emissions quickly and efficiently

We analyzed eight proposed federal carbon pricing policies to understand their impact on Florida. The policies have initial carbon prices ranging from \$15 to \$52 per ton of CO₂ and have various means of revenue usage. The bills are labeled by their primary sponsor.

Payroll Tax Cuts

Two bills use most revenues to reduce payroll taxes.

- REP. ROONEY
- REP. LIPINSKI

Dividends

Four bills use most revenues to return dividends (direct payments) to households.

- SEN. COONS
- SEN. WHITEHOUSE
- SEN. VAN HOLLEN
- REP. DEUTCH

Infrastructure Spending

Two bills use most revenues to invest in infrastructure.

- REP. FITZPATRICK
- REP. LARSON

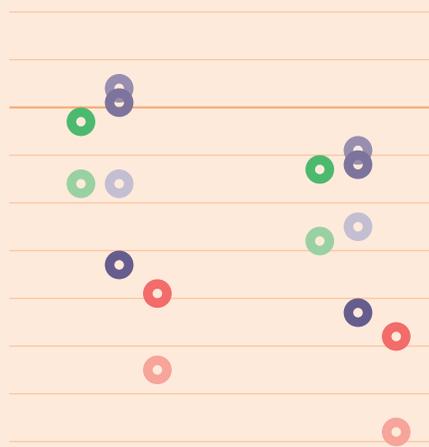
Impact Areas

Policy impacts are driven by changes in household expenditures and income.

- ⚡ **Energy Goods**
e.g., gasoline and electricity
- 🛒 **Other Goods**
e.g., healthcare and food
- 💰 **Sources of Income**
e.g. wages and dividends
- ⚖️ **Total Impact**

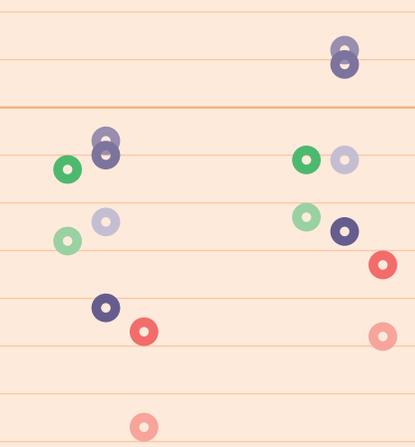
How will the policies affect Florida compared to the rest of the US?

US vs Florida



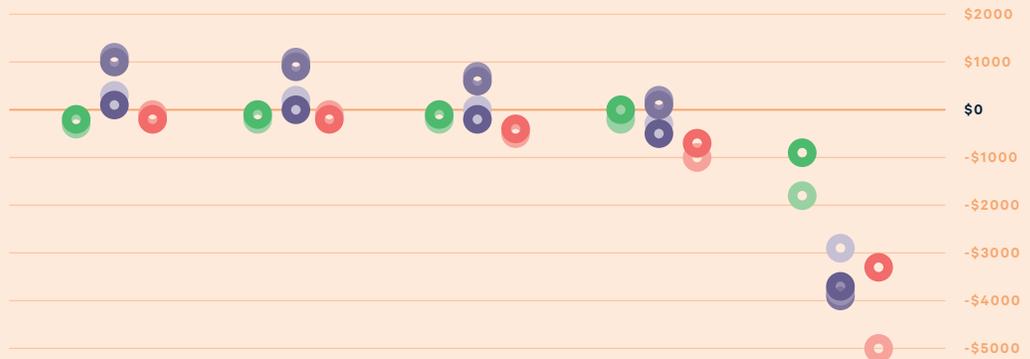
How will the policies affect urban and rural households in Florida differently?

Urban vs Rural



How will the policies affect households in Florida at different income levels?

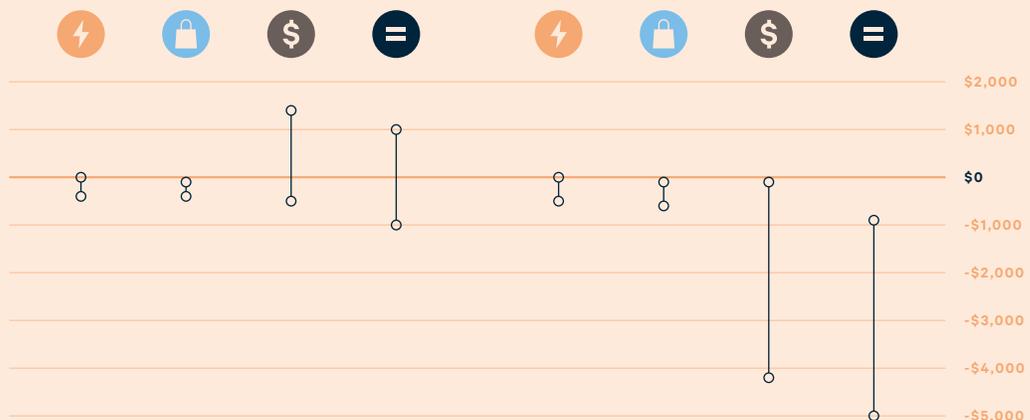
QUINTILE 1 (Below \$21k), QUINTILE 2 (\$21k - \$39k), QUINTILE 3 (\$39k - \$61k), QUINTILE 4 (\$61k - \$99k), QUINTILE 5 (Above \$99k)



How will the policies affect income and spending?

QUINTILES 1 - 4 vs QUINTILE 5

Household income under \$99k vs Household income over \$99k



*Does not include benefits of infrastructure investment or environmental benefits from mitigating climate change.