



# FACTS FLORIDA

A M E R I C A N S E C U R I T Y P R O J E C T

## Pay Now, Pay Later: Florida

Inaction on climate change will cause annual losses to Florida's industries throughout the next century. As early as 2025, Florida will likely see economic losses of at least \$27 billion each year—over \$3,100 per household.<sup>1</sup>

Real estate losses are projected to cost Floridians \$11 billion in 2025; yearly costs to this market may more than double by 2050 to \$23 billion.

Annual losses to the tourism industry will reach \$9 billion in 2025. Losses will increase more than four-fold just 25 years later, reaching \$88 billion in 2050.<sup>2</sup>

According to a new study, a failure to mitigate the effects of climate change could begin to cause serious gross domestic product and job losses within the next several decades. Between 2010 and 2050, it could cost Floridians \$146.3 billion in GDP and over 1.2 million jobs.\*

*\*GDP numbers are based on a 0% discount rate. Job losses are measured in labor years, or entire years of fulltime employment. Backus, George et al., "Assessing the Near-Term Risk of Climate Uncertainty: Interdependencies among the U.S. States," Sandia Report (Sandia National Laboratories, May 2010), 141. [https://cfwebprod.sandia.gov/cfdocs/CCIM/docs/Climate\\_Risk\\_Assessment.pdf](https://cfwebprod.sandia.gov/cfdocs/CCIM/docs/Climate_Risk_Assessment.pdf) (accessed March 23, 2011).*

Admittedly, the effects of climate change, a complex and intricate phenomenon, are difficult to predict with precision. Informed scientific and economic projections, as we have used in our research, however, allow us to see that Florida faces significant losses in industries crucial to its economy if no action is taken.

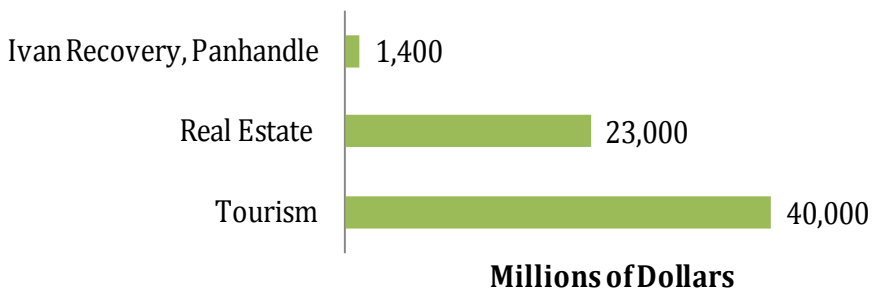
Moreover, data shows Floridians are in a position to benefit from the research, development, and use of renewable energy technologies. With the ability to produce 3,500-5,500 watt-hours per square meter, allocating one square mile in Florida for solar power generation can satisfy the energy needs of 1,200 homes in Florida annually.<sup>3</sup> Furthermore, by improving energy efficiency—and the Department of Energy has named over 4,400 possibilities—small- and medium-sized Floridian companies could grow their

net income; fewer than 50% of the identified changes have been made.<sup>4</sup> Should we fail to take action, Florida has much to lose.

## Pay Later: The Cost of Inaction

As of 2050, Florida is projected to see annual losses of \$92 billion a result of hurricane damage, real estate loss, decreases in tourism, and increases in electricity consumption.<sup>5</sup> Without accounting for the costs to other important industries, losses in these four sectors are likely to cost each household just shy of \$10,600 annually.<sup>6</sup> The costs incurred as a result of hurricanes Gustav and Ivan, which devastated the panhandle, will appear negligible compared to what the state could end up paying if Floridians continue business as usual.

### Cost of Severe Weather in 2050 Compared to Costs Incurred as a Result of Ivan's Effects on the Panhandle



Sources: Elizabeth Stanton and Frank Ackerman; Federal Emergency Management Agency<sup>7</sup>

## Coastal Areas in Jeopardy

Residential property damage from sea level rise is expected to total \$56 billion by 2100. **But losses are projected to reach \$11 billion as soon as 2025 and \$23 billion by 2050.**<sup>8</sup> Compared to other states, Florida faces the greatest threat from rising sea levels. The warming, rising waters of the Atlantic place much of the infrastructure along Florida's 1,300 miles of coastline in jeopardy.<sup>9</sup>

Real estate is Florida's largest industry. It is home to more coastal, seasonal housing than any other state. The state's 506,000 vacation homes amount to more than double the number located in Michigan, the second most popular coastal destination.<sup>10</sup> As of 2008, 57% of Florida's population, almost 10.5 million people, resided in the coastal counties.<sup>11</sup> Residential properties in the at-risk area are valued at \$130 billion; this area is also home to 334 public schools, 68 hospitals, and 74 airports, not to mention other businesses and critical infrastructure.<sup>12</sup> One study predicts that sea levels in the Florida Keys will increase by 7 inches by 2100 reducing property values by \$11 billion in this region alone.<sup>13</sup>

A report prepared by the Natural Resources Defense Council (NRDC) predicts that **water levels will reach 8.9 inches—possibly even 13.8—above 2000 levels by 2025.** By 2050, Floridians can expect sea levels from 17.7-27.6 inches above the 2000 level.<sup>14</sup> The NRDC report estimates that by 2060 the sea levels around Florida will rise by 27 inches, leaving areas in what the authors label the “vulnerable zone”—like 20% of Volusia and over 16% of Miami-Dade counties—inundated with water.<sup>15</sup>

Adding to the real estate losses, tropical storms will intensify as sea levels rise and oceans warm. **Hurricanes will cost \$6 billion annually in 2025, jumping to \$25 billion by 2050.** Damages between 1990 and 2006 averaged a fraction of these amounts—\$3.7 billion annually.<sup>16</sup> Higher sea levels increase the damage done by storm surges because the surge builds on top of a higher water base.<sup>17</sup>

The effects of rising sea levels and increasing, intensifying storms do not stop here. The strain will also be felt by Florida's property and business owners. As risk increases, it will be harder for those affected to find affordable insurance. Additionally, electricity costs will rise as heat waves increase in severity and frequency; this is especially true of Florida's growing and increasingly older population. **Costing an additional \$1 billion in 2025 and an additional \$5 billion by mid-century, Floridians will pay almost \$43 billion in electricity costs in 2050.**<sup>18</sup>

## Fewer Beachgoers and Tourists

If action is not taken to slow climate change, the tourism and recreation sectors will suffer significant losses.<sup>19</sup> **Projections show an annual \$9 billion loss by 2025, accelerating to as much as \$40 billion in annual losses by 2050.** This yearly cost to the state is expected to more than double by 2075.<sup>20</sup>

The tourism industry is Florida's second largest source of income. Each year, over 84 million tourists visit and another 13 million residents travel within the state. In 2008, tourism and the recreation industry accounted for nearly 6% of Florida's gross state product, or \$42 billion, and employed over 10% of the labor force.<sup>21</sup> But this

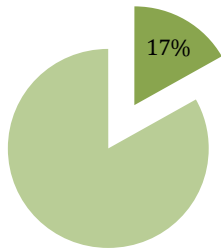
income and these jobs are threatened. For example, the Everglades, the third largest national park in the contiguous 48 states, which brings in \$120 million annually to the local economy,<sup>22</sup> is located in one of the most vulnerable areas. The lowest lying lands are projected to be completely submerged by 2100, but the Everglades will lose land—and potentially much of its wildlife population—gradually throughout the century.<sup>23</sup>

**If action is not taken to slow climate change, the tourism and recreation sectors will suffer significant losses. Projections show an annual \$9 billion loss by 2025, accelerating to as much as \$40 billion in annual losses by 2050.**

## Florida Oranges at Risk

**Florida's agriculture industry, which in 2005 employed 60% of orange grove workers in the United States, is also threatened.**<sup>24</sup> With its mild temperatures, Florida offers the perfect climate for crop cultivation throughout the year. In 2009, Florida was responsible for about 20% of U.S. fresh tomato sales, amounting to \$520 million in revenue. The state is also the top sugarcane producer, producing nearly half of the country's sales in 2009.<sup>25</sup> Water scarcity, the flooding of farmlands as sea levels rise, and severe storms place such profits in jeopardy. To the industry's benefit, increased temperatures will lessen the likelihood of winter freezes, but crops (particularly sugarcane and citrus) will require more irrigation with higher temperatures, and water scarcity will make this increasingly difficult.<sup>26</sup> This is especial-

## Floridian Labor Force Projected to be Directly Affected



Source: Bureau of Economic Analysis<sup>29</sup>

ly problematic considering Florida is already locked in disputes over water supply with Georgia and Alabama.<sup>27</sup> **By 2060, floods will claim 26,000 acres of farmland, 4,500 acres of pastureland, and 7,000 acres of Florida’s renowned citrus crop.**<sup>28</sup>

Conservatively, 20% of Florida’s labor force—those in certain food and beverage industries, transportation sectors, real estate, leisure and hospitality—will be significantly affected by climate change.

## Pay Now: The Benefits of Taking Action

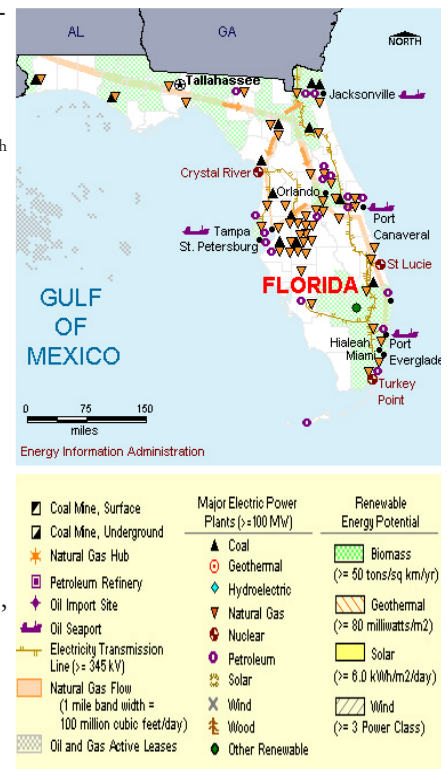
Not only does Florida stand to lose major parts of its income if we fail to mitigate the effects of climate change, but it is also situated to benefit from the development of renewable sources of energy. This is particularly true of solar power.

According to one solar panel company, Solar Direct, **Florida—the Sunshine State—has “virtually limitless access” to this natural resource** and, therefore, a large market for solar energy. Solar Direct provides Floridians with the opportunity to install solar panels on their homes. Savings on electricity range from 20-90% (depending on wattage and square footage installed) and the panels pay for themselves by the 10<sup>th</sup> year.<sup>30</sup>

Furthermore, energy independence is a less costly option than the alternative in the long term.<sup>31</sup> This is particularly important for a state that ranks third in energy consumption,<sup>32</sup> and is made even more important considering the damage that intensified hurricanes will cause to the ports Florida depends on for fuel deliveries.<sup>33</sup>

Preserving the orange groves yields additional benefits; citrus waste could produce 4 million gallons of ethanol at one planned facility in Hendry County alone.<sup>34</sup>

The implementation of a national Renewable Electricity Standard (RES), including initiatives like tax exemptions and grant opportunities, according to a study conducted by Navigant Consulting, would employ thousands of Floridians. For example, Florida’s jobs in the biomass industry<sup>35</sup> would double their current level. Floridian jobs in the renewable electricity sector would number 2,500 by 2025 without such initiatives, but this number is projected to skyrocket with the implementation of a 25% national RES, which provides incentives for the development of renewable energy technologies, reaching 15,000 to 17,500 jobs in the same amount of time.<sup>36</sup>



## Conclusion

Florida must consider action on climate change not just in terms of cost, but in terms of opportunities. If we give Florida’s population, businesses, and investors clear and consistent signals by properly offering initiatives and cultivating demand, investment and innovation in renewable technologies will follow.

**Floridians will have to pay for the effects of climate change.** The only remaining question is whether Floridians will pay

now, or pay later and run the risk of paying significantly more.

---

(Endnotes)

- 1 Projected costs of inaction are in 2006 dollars. Elizabeth Stanton and Frank Ackerman, *Florida and Climate Change: The Costs of Inaction*, Tufts University, November 2007, iii. [http://www.ase.tufts.edu/gdae/Pubs/rp/Florida\\_lr.pdf](http://www.ase.tufts.edu/gdae/Pubs/rp/Florida_lr.pdf) (accessed October 1, 2010); Calculations based on the 2006-2008 3-year household estimate, 8,684,100, and includes an estimated 1,603,365 empty housing units. U.S. Census Bureau, 2006-2008 American Community Survey, *Fact Sheet: Florida*. [http://factfinder.census.gov/servlet/ACSSAFFacts?\\_event=&geo\\_id=04000US12&\\_geoContext=01000US|04000US12&\\_street=&\\_county=&\\_cityTown=&\\_state=04000US12&\\_zip=&\\_lang=en&\\_sse=on&ActiveGeoDiv=&\\_useEV=&pctxt=fph&pgsl=040&\\_submenuId=factsheet\\_1&ds\\_name=DEC\\_2000\\_SAFF&\\_ci\\_nbr=null&qr\\_name=null&reg=&\\_keyword=&\\_industry=](http://factfinder.census.gov/servlet/ACSSAFFacts?_event=&geo_id=04000US12&_geoContext=01000US|04000US12&_street=&_county=&_cityTown=&_state=04000US12&_zip=&_lang=en&_sse=on&ActiveGeoDiv=&_useEV=&pctxt=fph&pgsl=040&_submenuId=factsheet_1&ds_name=DEC_2000_SAFF&_ci_nbr=null&qr_name=null&reg=&_keyword=&_industry=) (accessed October 19, 2010).
- 2 Elizabeth Stanton and Frank Ackerman, *Florida and Climate Change: The Costs of Inaction*, iii.
- 3 National Wildlife Federation, *Charting a New Path for Florida's Electricity Generation and Use*, 2. [http://www.nwf.org/Global-Warming/-/media/PDFs/Global%20Warming/Clean%20Energy%20State%20Fact%20Sheets/FLORIDA\\_10-22-9.ashx](http://www.nwf.org/Global-Warming/-/media/PDFs/Global%20Warming/Clean%20Energy%20State%20Fact%20Sheets/FLORIDA_10-22-9.ashx) (accessed October 1, 2010).
- 4 Modifications identified would have an average 1.4 year return on investment. Environmental Defense Fund, *Clean Energy Jobs in Florida*, 2010. <http://www.edf.org/page.cfm?tagID=43258> (accessed October 1, 2010).
- 5 Elizabeth Stanton and Frank Ackerman, *Florida and Climate Change: The Costs of Inaction*, iii.
- 6 Ibid; Calculations based on the 2006-2008 3-year household estimate, 8,684,100, and includes an estimated 1,603,365 empty housing units. U.S. Census Bureau, 2006-2008 American Community Survey.
- 7 Federal Emergency Management Agency, *Hurricane Ivan Recovery In The Panhandle Adds Up To \$1.4 Billion*, September 9, 2005. <http://www.fema.gov/news/newsrelease.fema?id=18831> (accessed October 19, 2010).
- 8 Elizabeth Stanton and Frank Ackerman, *Florida and Climate Change: The Costs of Inaction*, iii.
- 9 Governor's Action Team on Energy and Climate Change, *Phase 1 Report: Florida's Energy and Climate Change Action Plan Pursuant to Executive Order 07-128*, November 2007, 55. [http://www.dep.state.fl.us/climatechange/files/20071101\\_final\\_report.pdf](http://www.dep.state.fl.us/climatechange/files/20071101_final_report.pdf) (accessed October 8, 2010); Elizabeth Stanton and Frank Ackerman, *Florida and Climate Change: The Costs of Inaction*, vi.
- 10 National Oceanic and Atmospheric Administration, U.S. Department of Commerce, *Population Trends Along the Coastal United States: 1980 – 2008*, September 2004, 9-10 [http://oceanservice.noaa.gov/programs/mb/pdfs/coastal\\_pop\\_trends\\_complete.pdf](http://oceanservice.noaa.gov/programs/mb/pdfs/coastal_pop_trends_complete.pdf) (accessed October 14, 2010)
- 11 Ibid, 38.
- 12 Elizabeth Stanton and Frank Ackerman, *Florida and Climate Change: The Costs of Inaction*, vi.
- 13 Richard Luscombe, "As Florida Keys residents confront rising sea levels, what lessons?," *The Christian Science Monitor*, March 4, 2010. <http://www.csmonitor.com/Environment/2010/0304/As-Florida-Keys-residents-confront-rising-sea-levels-what-lessons> (accessed October 15, 2010).
- 14 The Natural Resources Defense Council assumes a 2.4 and 4.9°F increase in temperature and uses the Intergovernmental Panel on Climate Change research and recent data on the potential rate at which Greenland's glaciers will melt for 2025 and 2050, respectively. Elizabeth Stanton and Frank Ackerman, *Florida and Climate Change: The Costs of Inaction*, 10.
- 15 Ibid, v, 16.
- 16 Ibid, 57-58.
- 17 Environmental Protection Agency: *Coastal Zones and Sea Level Rise*, 2010. <http://www.epa.gov/climatechange/effects/coastal/index.html> (accessed October 14, 2010).
- 18 Elizabeth Stanton and Frank Ackerman, *Florida and Climate Change: The Costs of Inaction*, 50-51.
- 19 National Resources Defense Council: *Global Warming Threatens Florida: The changing climate will have a profound effect on the Sunshine State's citizens, economy and environment*, 2001. <http://www.nrdc.org/globalwarming/nflorida.asp> (accessed October 14,



- 2010); World Tourism Organization, *Climate Change and Tourism*, April 2003, 27-28. <http://www.world-tourism.org/sustainable/climate/final-report.pdf> (accessed October 15, 2010).
- 20 Elizabeth Stanton and Frank Ackerman, *Florida and Climate Change: The Costs of Inaction*, 23.
- 21 Employment percentage based on employed 2008 Floridian labor force. Bureau of Economic Analysis, *SA25N Total full-time and part-time employment by NAICS industry 1/ -- Florida*, September 20, 2010. <http://www.bea.gov/regional/spi/default.cfm?selTable=SA25N&selSeries=NAICS> (accessed October 19, 2010); Bureau of Economic Analysis, *Gross Domestic Product by State: Florida*, June 2, 2009. <http://bea.gov/regional/gsp/action.cfm?series=NAICS&querybutton=Download%20CSV&selTable=200&selFips=12000&selLineCode=ALL&selyears=2008> (accessed October 19, 2010).
- 22 U.S. Department of the Interior, *Everglades National Park Service – Press Kit*. <http://www.nps.gov/ever/parknews/presskit.htm> (accessed October 14, 2010).
- 23 Elizabeth Stanton and Frank Ackerman, *Florida and Climate Change: The Costs of Inaction*, vii.; Dan Vergano, “Sea change coming for the Everglades,” *USA Today*, June 5, 2006. [http://www.usatoday.com/weather/climate/2006-05-30-everglades-globalwarming\\_x.htm](http://www.usatoday.com/weather/climate/2006-05-30-everglades-globalwarming_x.htm) (accessed October 15, 2010).
- 24 Elizabeth Stanton and Frank Ackerman, 25.
- 25 Ibid; U.S. Department of Agriculture, *State Fact Sheet: Florida*, September 10, 2010. <http://www.ers.usda.gov/statefacts/fl.htm> (accessed October 19, 2010).
- 26 Elizabeth Stanton and Frank Ackerman, 26-27.
- 27 U.S. Global Change Research Program, *Global Climate Change Impacts in the United States*, 48. <http://downloads.globalchange.gov/usimpacts/pdfs/climate-impacts-report.pdf> (accessed October 14, 2010).
- 28 Elizabeth Stanton and Frank Ackerman, *Florida and Climate Change: The Costs of Inaction*, 28.
- 29 Based on the 2008 employed labor force and includes the agriculture, hospitality, and real estate sectors. Bureau of Economic Analysis, *SA25N Total full-time and part-time employment by NAICS industry 1/ -- Florida*.
- 30 “16 Tips on Doing a Solar Home Make-Over in the Sunshine State,” *Solar Direct*, 2006, 1. <http://www.solardirect.com/solarhome.pdf> (accessed October 14, 2010).
- 31 Ibid, 3.
- 32 Governor’s Action Team on Energy and Climate Change, 55.
- 33 U.S. Global Change Research Program, 63.
- 34 U.S. Energy Information Administration, *State Energy Profiles: Florida*, July 2010. [http://www.eia.doe.gov/state/state\\_energy\\_profiles.cfm?sid=FL](http://www.eia.doe.gov/state/state_energy_profiles.cfm?sid=FL) (accessed October 14, 2010).
- 35 While burning waste does produce toxic gases, like carbon, it releases less pollution than fossil fuels. Furthermore, the growing of biomass crops, captures about the same amount of carbon as burning emits. The government also has in place scrubbing and filtering requirements for biofuel-producing plants. U.S. Energy Information Administration, *Biomass*. [http://www.eia.doe.gov/kids/energy.cfm?page=biomass\\_home-basics](http://www.eia.doe.gov/kids/energy.cfm?page=biomass_home-basics) (accessed October 19, 2010).
- 36 Julie Harrington, et al., *Energy Efficiency and Renewable Energy in Florida*, Executive Summary, March 12, 2010, 6. <http://www.cefa.fsu.edu/uploaded%20current%20projects/receexec.pdf> (accessed October 14, 2010).