FLORIDA’S RISING SEAS
Mapping Our Future

SEA LEVEL 2040
SEA LEVEL 2070

A joint project of...

1000 FOF.org/sealevel2040/
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It is clear our changing climate brings new challenges to Florida.
While there are many impacts, this study focuses specifically on the interrelationship between sea level rise, population growth, and development patterns, and how our state and communities can better plan for these impacts.
This project is intended to guide Floridians to a clearer understanding of the vulnerability of our state’s lands, waters, and communities to the combined impacts of population growth, sea level rise, and development patterns.
The time is now for Florida and its communities and counties to commit to sound and fiscally responsible planning for what will be a more challenging future.
Both Sea Level 2040 and Sea Level 2070 reflect potential impacts of population growth, development patterns, and sea level rise on Florida over the coming decades.
Each includes Future Scenarios, which are a planning tool for envisioning potential futures based on reasonable assumptions to examine the potential impacts of trends and policy decisions.
Sea Level 2040 includes nearer term future scenarios that could be used for conservation and other planning, including for the Florida Wildlife Corridor.
Sea Level 2070 includes longer-term future scenarios to reflect the cumulative effects of many decisions over decades.
Methodology
Sea Level 2040 Rests on Four Assumptions:

1. Florida’s population will grow to 26,406,000 residents in 2040, a 21% increase over 2021

(Based on 2021 Florida Bureau of Economic and Business Research (BEBR) medium projections)
2. Sea Level will rise by 0.25 meters

(Based on the 2022 NOAA Intermediate sea level rise projection)
3. Residents on lands to be lost to sea level rise will relocate:

- Half will stay in the same county
- If there isn’t sufficient land, the balance will be allocated to adjacent counties.
- The other half are assumed to move out of state.

(Based on the 2022 NOAA Intermediate sea level rise scenario and a Florida State University (FSU) study on population impacts (Hauer 2016))
4. Some lands (closer to cities and major roads) are more likely to develop than others (wetlands)

(Based on Likelihood of Development assessment)
Sprawl 2040 Assumes 2019 densities and patterns of development will continue over the next two decades as the population grows. Factors in the impacts of sea level rise on Florida’s lands and the resulting need for population relocation.
2. Conservation 2040

Assumes the same population growth and sea level rise as in the Sprawl Scenario

But also assumes that:

- Florida’s priority natural lands will not be developed
- Any new development will be 30% more compact
Land Use Categories:

- **Developed**: Residential, Commercial, Industrial and other lands that are developed

- **Protected Natural**: Florida’s priority natural lands (excluding protected agricultural lands) that have been protected through federal, state, local and private programs

- **Protected Agriculture**: Agricultural lands that may be protected for their natural values, such as wetlands, habitat, and the like

- **Unprotected Agriculture**: Lands that are used for croplands, livestock, aquaculture and other agricultural uses

- **Other**: All lands not included in the above categories of developed, protected natural, agriculture, or protected agriculture, including timberlands, mining lands, and other miscellaneous land uses
What are “state priority natural lands?”

Lands that are either currently protected or are high priorities for protection (through public purchase, easement, zoning or some other means) for Florida’s biodiversity, water, or other ecosystem services, including:
1. Current Florida Managed Lands (FLMA)
2. Future priority natural lands including:
   - Florida Forever conservation land protection projects
   - Priorities 1, 2, and 3 in the Florida Ecological Greenways Network (FEGN), otherwise known as the Florida Wildlife Corridor
What is “protected”?

Some are owned by Federal, State or Local Government

Some are protected through “conservation easement” where the land remains under private or public ownership with some restrictions on how the property is used to protect its conservation or agricultural value.
Florida Counties with Local Land Referenda

- Alachua
- Brevard
- Collier
- Flagler
- Hillsborough
- Indian River
- Lee
- Manatee
- Martin
- Miami-Dade
- Nassau
- Palm Beach
- Pasco
- Pinellas
- Polk
- Sarasota
- Seminole
- St. Lucie
- Volusia
How Do We Protect These Lands?

State Resources:
- Florida Forever
- Rural and Family Lands
- Florida Communities Trust
- Water Management Districts

Federal Resources:
- Natural Resources Conservation Service (NRCS)
- United States Fish and Wildlife Service (USFWC)
- United States Department of Agriculture (USDA)

Local Resources:
- County Conservation Referenda
- Planning Process
  - Future Land Use Maps (FLUM)
  - Local Comprehensive Plans
  - Zoning
  - Local Government Easements

Private Resources:
- Land Trusts/Conservation Easements
- Foundation Funding
Possible State Funding Protection Scenarios:

**GOAL:** Protect 6 million acres (3/4 of the unprotected acreage in the Florida Wildlife Corridor) of the highest state priority lands

**ASSUMPTION:** A very approximate average of $4,000 an acre, with the total cost $24 billion in today’s dollars.

- **800-year scenario** – If the Legislature and Governor approved $30 million a year (as it did on average between 2009 and 2020) for Florida Forever and Rural and Family Lands programs

- **80-year scenario** – If $300 million a year were split between the two programs (historic funding and approximate average for 2021 and 2022)

- **48-year scenario** – If $500 million a year were evenly split between the two programs
Protected Lands Can Have Multiple Natural and Economic Values

- Resource-based recreation & ecotourism
- Wildlife habitat & biodiversity
- Storm protection
- Flood control
- Water storage and cleansing
- Carbon sequestration
- Food & fiber security
Major Statewide Results
STATEWIDE Developed Lands

Baseline:
About 5.4 million acres or close to 15% of Florida’s acreage

Sprawl Scenario:
Almost 6.4 million acres or almost 18% of Florida’s acreage

Conservation Scenario:
6.1 million acres or almost 17% of Florida’s acreage
Baseline:
Close to 10 million acres or 27% of Florida’s acreage

Sprawl Scenario:
Approximately 9 million acres of state priority natural lands remain undeveloped, or 25%

Conservation Scenario:
14 million acres of state priority natural lands remain undeveloped, almost 39% of Florida’s acreage
STATEWIDE Total Agricultural Lands

(Including Protected Agriculture)

Baseline:
7.3 million acres of agricultural lands or 20% of Florida’s acreage

Sprawl Scenario:
6.9 million acres or slightly less than 19% of Florida’s acreage

Conservation Scenario:
7 million acres or slightly more than 19% of Florida’s acreage
**Baseline:**
856,000 acres or a little more than 2% of Florida’s acreage

**Sprawl Scenario:**
854,000 acres with 2,000 acres lost due to sea level rise

**Conservation Scenario:**
3,236,000 acres or close to 9% of Florida’s acreage
STATEWIDE Other Lands

(Timber, Mining, Unprotected Natural, etc.)

Baseline:
11.8 million acres or more than 32% of Florida’s acreage

Sprawl Scenario:
11 million acres or more than 30% of Florida’s acreage

Conservation Scenario:
6.1 million acres or about 17% of Florida’s acreage
Comparing the Conservation and Sprawl Scenarios:

- *Conservation 2040*
  - Developed
  - Protected Natural (Excluding Agriculture)
  - Protected Agriculture
  - Unprotected Agriculture
  - Open Water
  - Sea Level Rise

- *Sprawl 2040*

270,000 fewer acres of developed lands

5 million more acres of undeveloped priority natural land

2.4 million more acres of protected agricultural lands
Under the Conservation 2040 Scenario:

Baseline:
- Protected Natural (Excluding Agriculture): 14 million acres
- Protected Agriculture: 3.2 million acres
- Open Water: 3.8 million acres

Conservation 2040:
- Protected Natural (Excluding Agriculture): 14 million acres
- Protected Agriculture: 3.2 million acres
- Open Water: 3.8 million acres

- Total Other: 5.8 million acres

14 million acres of protected natural lands
3.2 million acres of protected agricultural land
3.8 million acres of unprotected agricultural lands
STATEWIDE MAPS 2040

Baseline

Sprawl 2040

Conservation 2040

Legend:
- Developed
- Protected
- Sea Level Rise
- Other

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Sea Level 2070 is more comparable to the 2016 Florida 2070/Water 2070 reports, and is intended to provide a comparison with the previous 2070 scenarios that did not include SLR.
Sea Level 2070 is based on different baseline information and assumptions than Sea Level 2040. The Sea Level 2040 and Sea Level 2070 maps have different colors to reflect this.
Sea Level 2070 Rests on Four Assumptions:

1. Florida’s population will grow to 33,721,828 residents in 2070, an increase of more than 12.2 million residents, or a 57% increase over 2019 (Based on 2015 Florida Bureau of Economic and Business Research (BEBR) medium projections)

2. Sea Level will rise by 0.9 meters (Based on the 2017 NOAA Intermediate High sea level rise projection)
3. Residents on lands to be lost to sea level rise will relocate

(Based on the 2017 NOAA Intermediate High sea level rise scenario and a Florida State University (FSU) study on population relocation (Hauer 2016))

4. Some lands (closer to cities and major roads) are more likely to develop than others (wetlands)

(Based on Likelihood of Development assessment)
Sea Level 2070 Has Two Scenarios:

1. Sprawl 2070
   Assumes 2010 densities and patterns of development will continue over the next five decades as the population grows. Factors in the impacts of sea level rise on Florida’s lands and the resulting need for population relocation.
2. Conservation 2070

Accounts for the same population growth and sea level rise as in the Sprawl Scenario

But also assumes that:

- Florida’s identified priority natural lands will be protected
- Any new development will be 20% more compact
- Greater redevelopment will occur
Major Statewide Results
Population Growth and Sea Level Rise Impacts:

- 12.2 million more residents, a 57% increase
- 1.7 million acres of land lost due to sea level rise, including 1.4 million acres of protected conservation land
- 906,000 residents relocated due to sea level rise
Comparing the Baseline and Sprawl Scenarios:

- Nearly 3.5 million more acres of developed land, an increase of 64%
- 1.8 million acres of agricultural lands lost
- 1.9 million acres of “other” lands lost
Comparing the Conservation and Sprawl Scenarios:

- Conservation 2070
- Sprawl 2070

1.3 million fewer acres of developed lands
7.3 million more acres of protected natural and agricultural lands
Under the Conservation 2070 Scenario:

- **Baseline**
  - Developed
  - Protected Natural (Excluding Agriculture)
  - Protected Agriculture
  - Unprotected Agriculture
  - Total Other
  - Open Water
  - Sea Level Rise

- **Conservation 2070**
  - 14 million acres of protected natural lands
  - 3.2 million acres of protected agricultural land
  - 3 million acres of unprotected agricultural lands
STATEWIDE MAPS 2070

Baseline

Sprawl 2070

Conservation 2070

- Developed
- Protected
- Sea Level Rise
- Other

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The Florida Wildlife Corridor (FWC)
Many of Florida’s priority lands for conservation are in the Florida Wildlife Corridor (FWC), which has been a state legislative focus in the last few years.

The FWC lays out a vision to protect a landscape-scale ecological corridor throughout much of the state.
The FWC builds on two major state initiatives launched in the 1980s:

1. Greenways Planning: Large-scale planning for a statewide system of greenways and trails linking these protected lands, which resulted in the creation of the Florida Ecological Greenways Network (FEGN)

Florida Office of Greenways & Trails
2. State Land Acquisition:
Statewide conservation and recreation lands acquisition programs known as Preservation 2000 and Florida Forever
Both the Sprawl 2040 and 2070 Scenarios point to significant development of state priority lands over the coming decades if critical lands are not protected.
By 2040, roughly 206,000 acres in the FWC could be lost to development or sea level rise

By 2070, 1.2 million acres of state priority lands within the FWC could be lost
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Recommendations
1. Conserve Florida’s Priority Natural Lands, Including Those in the Florida Wildlife Corridor

Florida must recommit to significant investment in land conservation
Florida must become even more strategic in the way it protects lands through acquisition, conservation and agricultural easements, local zoning or other means:
• Which lands are most vulnerable to development?

• Which are needed to prevent fragmentation of larger landscapes that protect wildlife habitat for endangered panther and black bear, or water supply and quality?

• Which could provide important ecosystem services including water filtration, flood storage, or storm protection?

• Which could protect important recreational lands and waters and support eco-tourism and the economy
2. Encourage Future Development to be More Sustainable and Fiscally Responsible

Redirect development away from vulnerable areas (including inland areas vulnerable to flooding)
Promote more compact development patterns and include shops, schools, and offices nearby to create more livable communities while protecting Florida’s rural lands and waters.
Recognize that more compact development does not need to be high-rise, as 4 to 6 story development can be more livable and cost effective.
Develop tools to promote fiscal responsibility in state and community planning

DeWitt Taylor Building
$87,105 taxes per acre

Beymer Building
$227,583 taxes per acre

Super Walmart
$8,647 taxes per acre
THE FUTURE STARTS NOW
By 2040, Florida is projected to have:
- 4.9 million more residents, a 23% increase over 2019
- Almost 1 million acres lost to sea level rise
- More than 200,000 residents needing to relocate

Even with population growth and sea level rise, with significant land conservation and more sustainable development patterns instead of continued sprawl, Florida could have:
- More than 5 million more acres of protected natural land
- Almost 2.4 million more acres of protected agricultural land
- 272,000 fewer acres of developed land
By 2070, Florida is projected to have:

- 12.2 million more residents, a 57% increase over 2019
- Almost 1.7 million acres lost to sea level rise
- Almost 1 million residents needing to relocate

Even with population growth and sea level rise, with significant land conservation and more sustainable development patterns instead of sprawl, Florida could have:

- Almost 1.3 million fewer acres of developed land
- More than 5 million more acres of protected natural land
- Almost 2.3 million more acres of protected agricultural land
Major Takeaways:

Accelerate protection of state priority natural lands

1. We are starting to reach a threshold where we can expect more rural impacts from sprawling development including on areas important for protecting Florida's biodiversity, ecosystem services, and natural capital.

2. We still have time to protect the most strategically important resources, but it will require a multi-decade commitment to conservation land protection (Florida Forever and Rural and Family Lands programs and other initiatives) as well as the use of other tools to reduce greenfield development.
Major Takeaways:

Focus on better planned and fiscally responsible development to protect natural and agricultural lands, taxpayer dollars, our quality of life, and support Florida’s diverse economy

3. If Florida could concentrate development and lessen sprawl, more land could be set aside for conservation, and our communities would be more livable. While Florida’s development has become slightly more compact over the last decade, much more needs to be done and at a faster pace.

4. We must start now to prevent our state’s most important natural and agricultural lands – so essential to Florida’s economy, quality of life, and more – from being converted to the “final crop” of rooftops and asphalt.
Each and every day, our state, counties, and municipalities make decisions – both large and small – on where, how, and what type of development should take place and where land conservation should occur.
The Time is Now to Start Making Better Choices

Baseline

Sprawl 2070

Conservation 2070

Developed  Protected  Sea Level Rise  Other
In partnership with the Florida Conservation Group:
Agriculture 2040 and 2070
Coming Soon!
We Gratefully Acknowledge the Following Funders:

Florida Department of Agriculture and Consumer Services (FDACS)

Natural Resources Conservation Service (NRCS)

Cornelia T. Bailey Foundation
About 1000 Friends of Florida

- Florida’s leading nonprofit advocate of growth management since 1986
- Working with citizens, community and state leaders, conservation and business groups to advance our goals
- Building better communities – walkable neighborhoods with affordable housing and alternatives to automobiles
- Saving special places – protecting Florida’s environment, unique communities, heritage
- Fighting sprawl – low-density, automobile-dependent development
- Connecting people with planning

www.1000fof.org
About the Center for Landscape Conservation Planning

University of Florida Dept. of Landscape Architecture
Tom Hoctor, Director
Michael Volk, Associate Director

Mission: Conduct applied research on the relationship between conservation and land use, learning opportunities for students, and expertise on biodiversity and green infrastructure design and planning to facilitate resilience and sustainability of natural, rural, and built environments.

conservation.dcp.ufl.edu & www.facebook.com/UFCLCP

Area of Focus

Applied regional conservation planning and research

Urban Green Infrastructure and Climate-wise Design

Image Courtesy of Carlton Ward, Jr. CarltonWard.com
2016 joint study with 1000 Friends and UF GeoPlan Center (under Paul Zwick and Peggy Carr) examining the impact of projected population growth on land and water use in Florida over the next 50 years

Showing the land, water that can be saved through more compact development and conservation

Workshops focusing on 8 counties thus far: Palm Beach, Martin, Walton, St. Johns, Brevard, Seminole, Volusia, Lake

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