



# ENDANGERED SPECIES OF FLORIDA IN THE FACE OF CLIMATE CHANGE

FOR THE

#GATORGOOD

MATHIEU BASILLE  
[basille@ufl.edu](mailto:basille@ufl.edu)

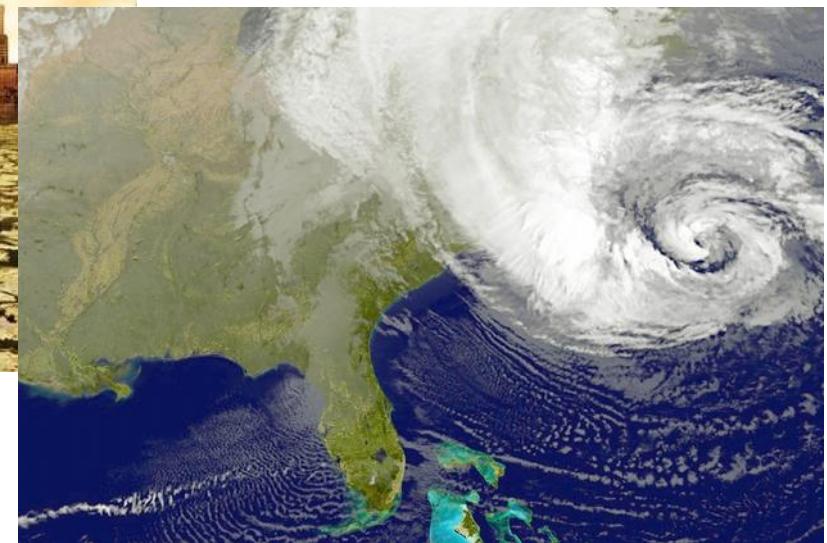
FORT LAUDERDALE RESEARCH AND EDUCATION CENTER



***A CHANGING WORLD***

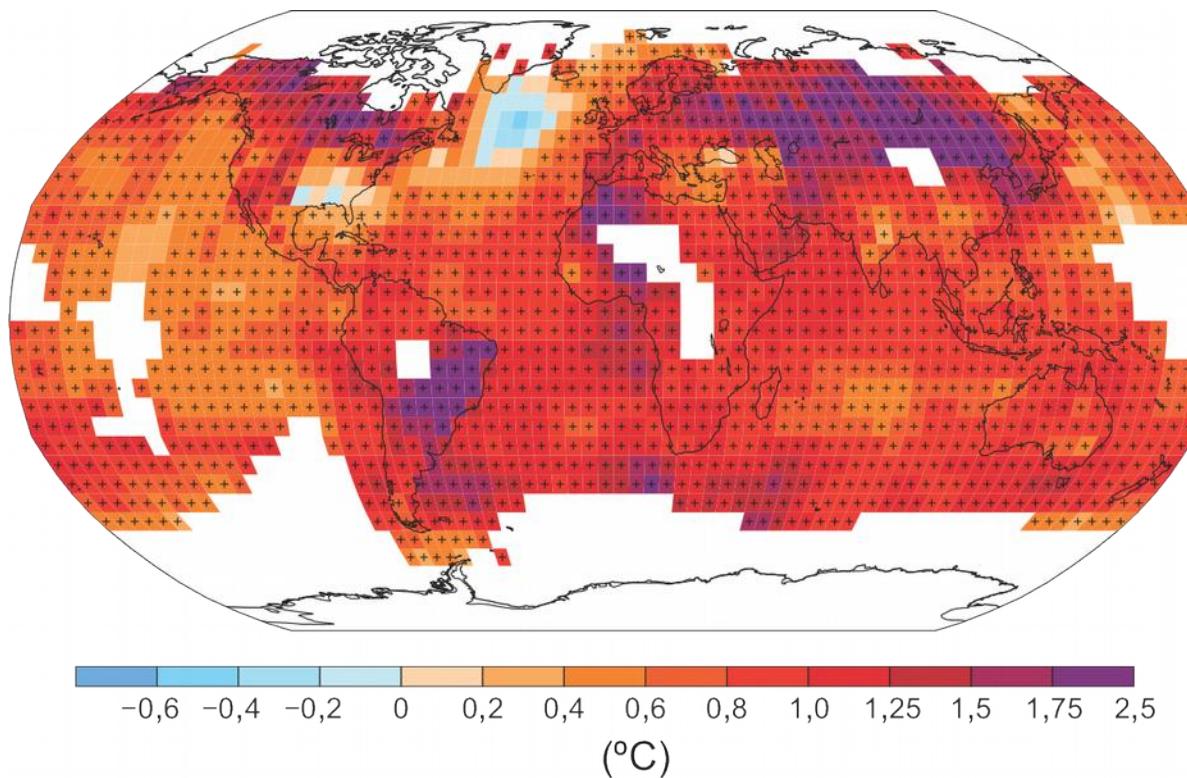
# A CHANGING WORLD

Global change is a major change on a geological timescale

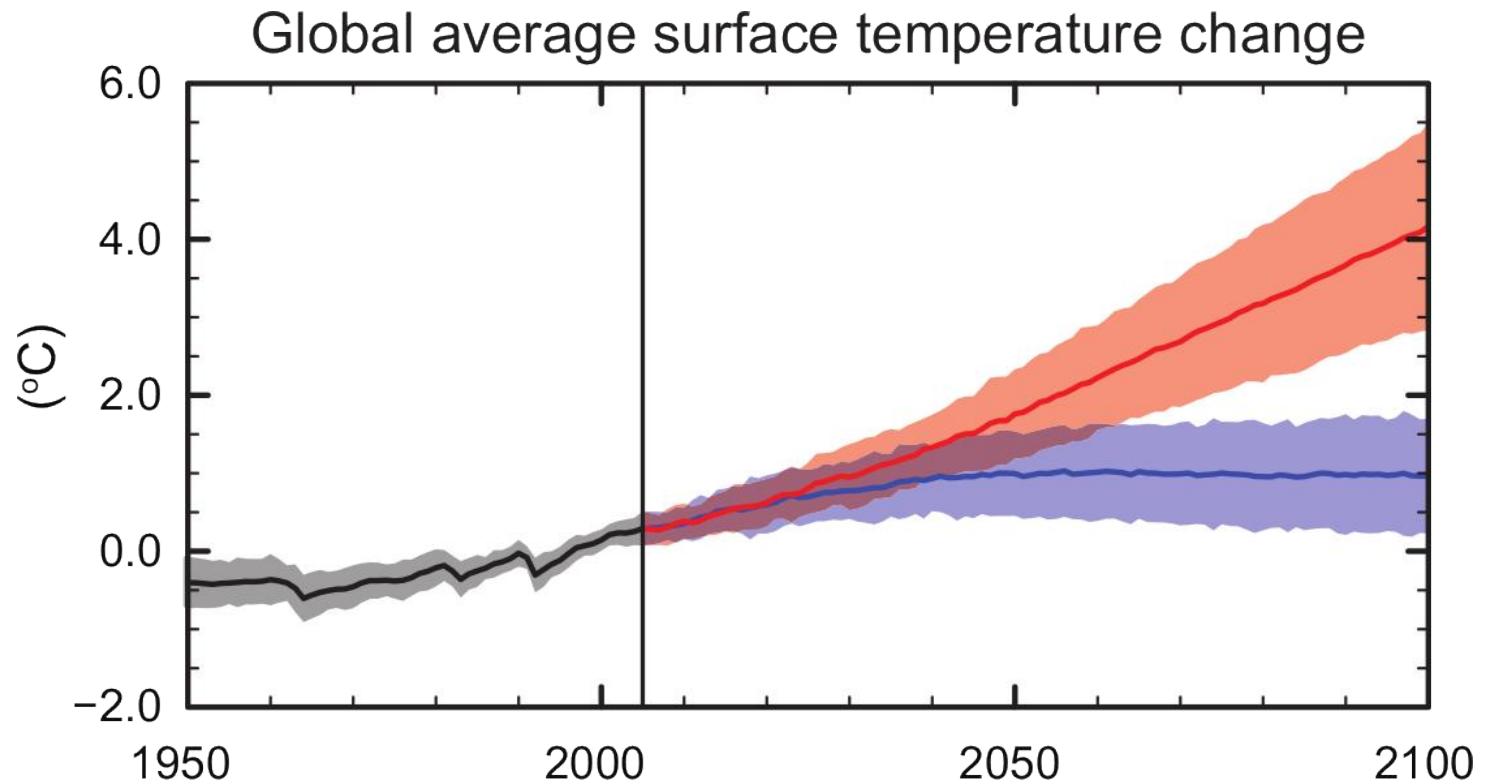


# WARMER

Observed change in surface temperature 1901-2012

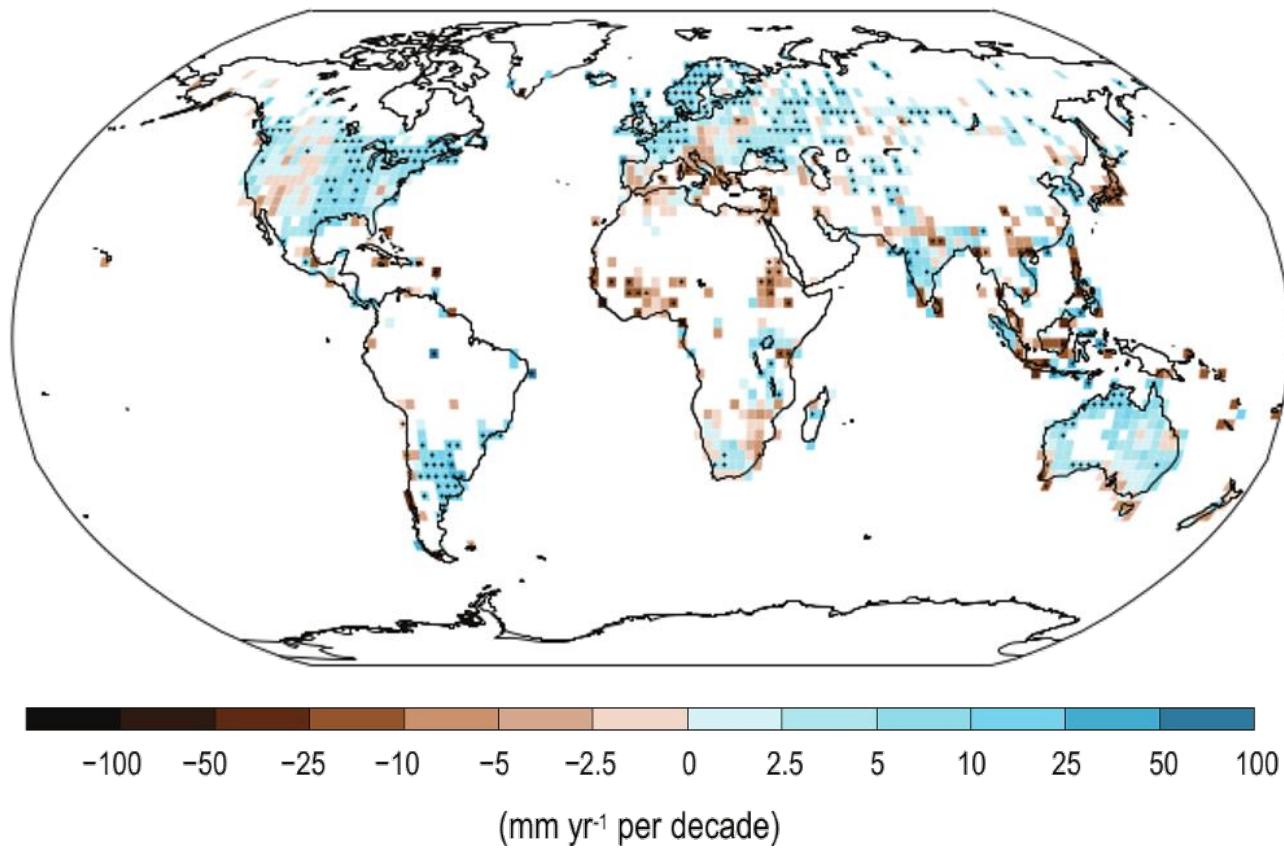


# WARMER

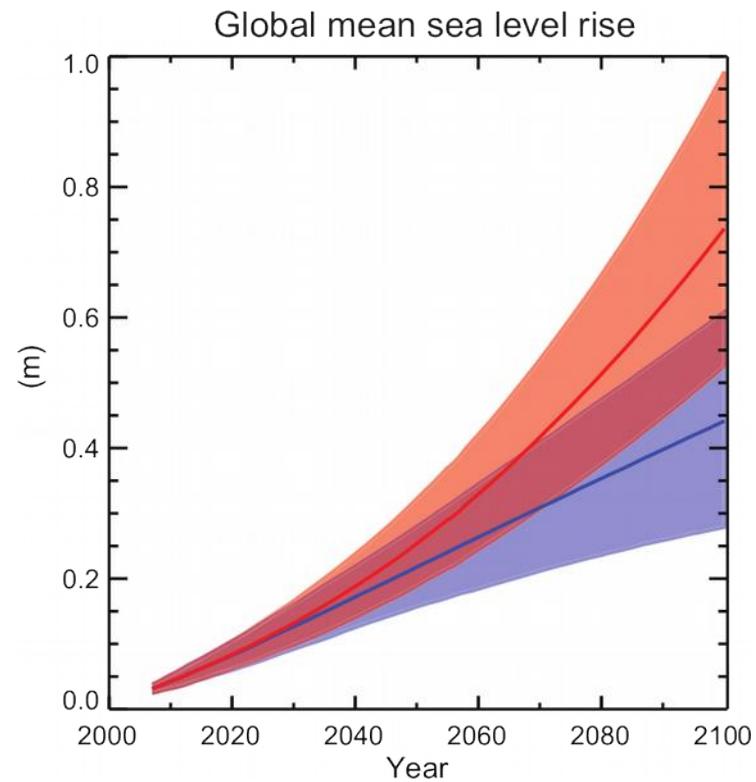


# WETTER

Observed change in annual precipitation over land  
1901– 2010



# WETTER





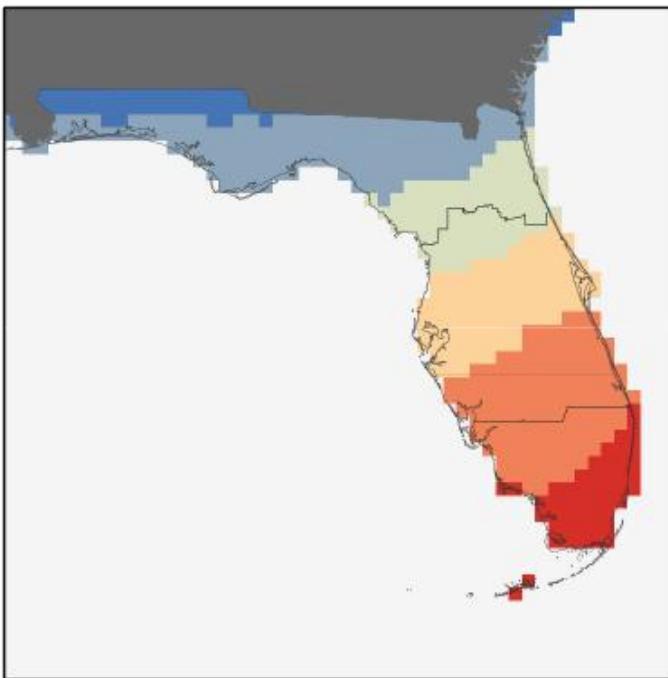
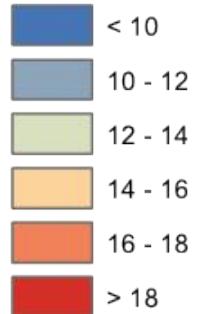
***FLORIDA IN A CHANGING WORLD***

# WELCOME TO THE TROPICS

Present

2050

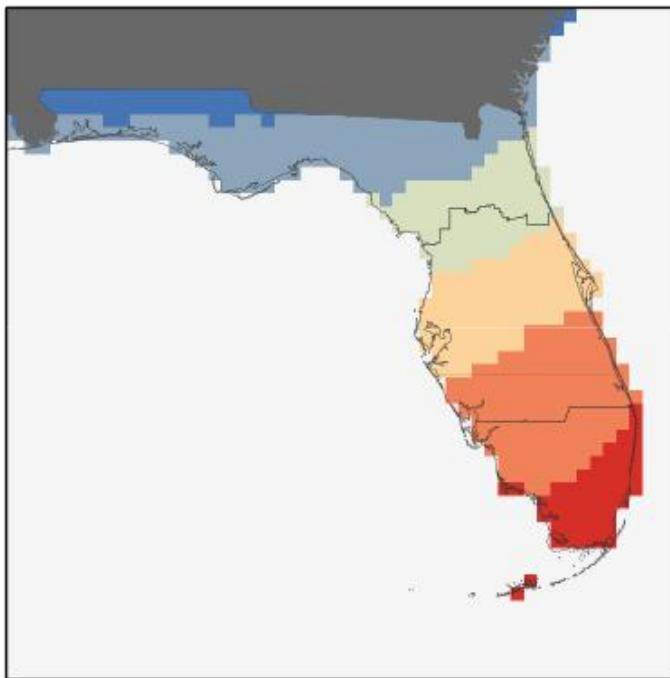
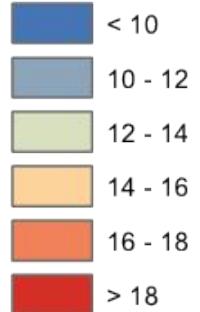
January temperature (C)



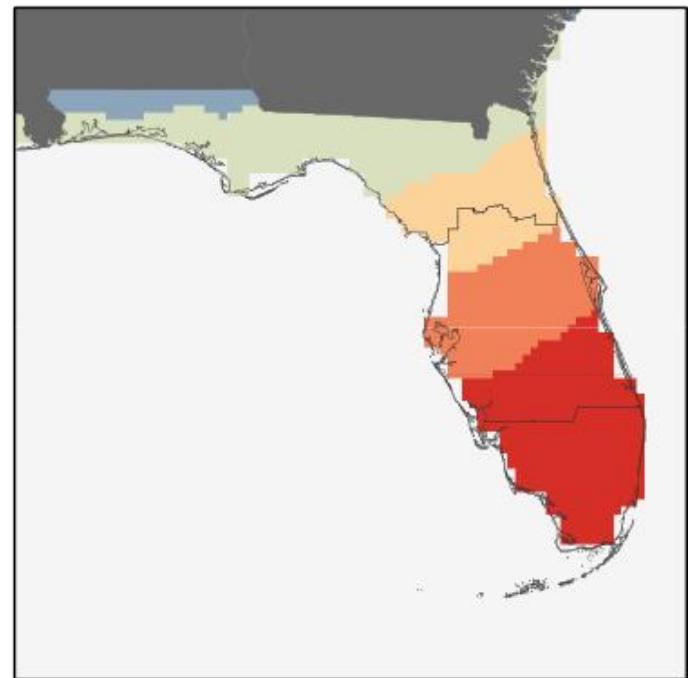
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Present

January temperature (C)



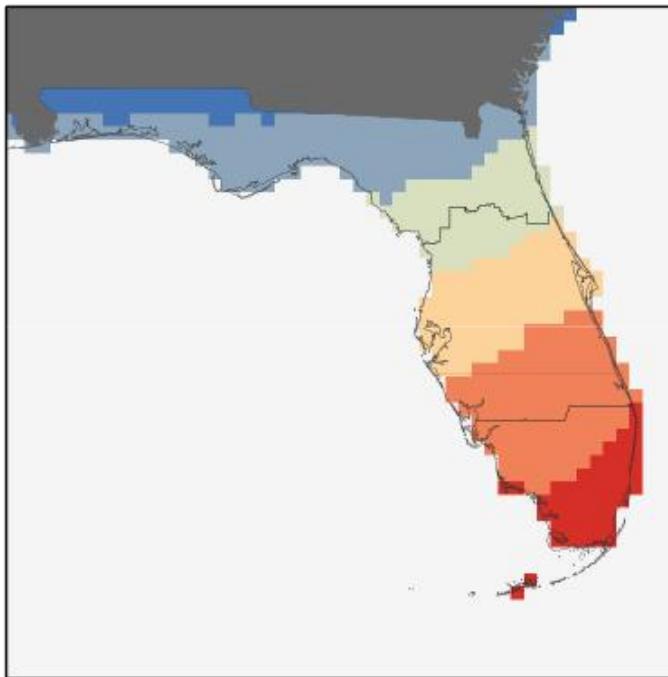
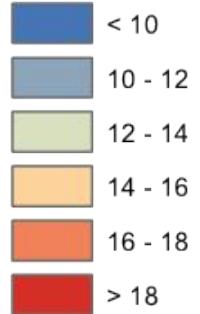
2050



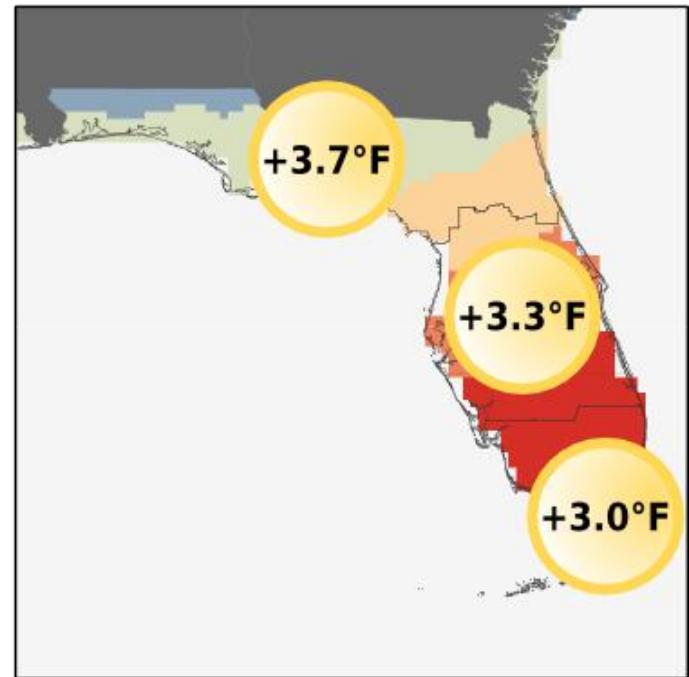
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Present

January temperature (C)



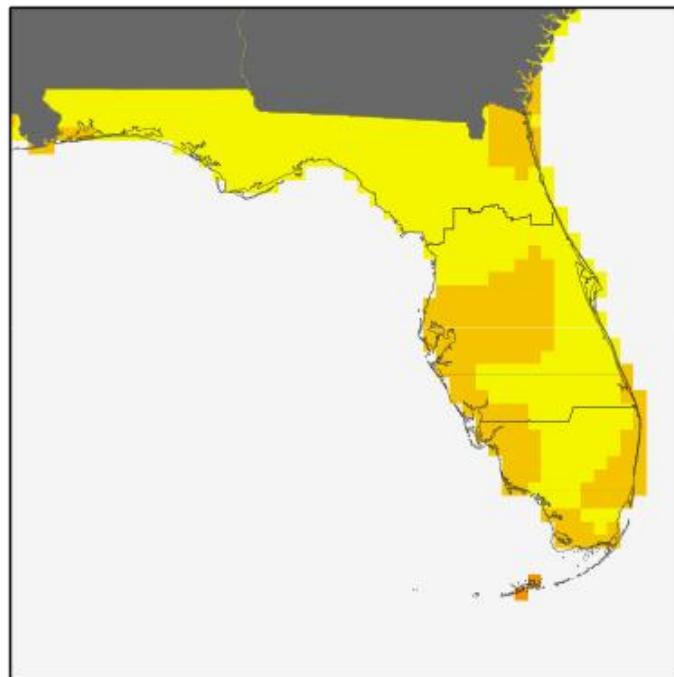
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# WELCOME TO THE TROPICS

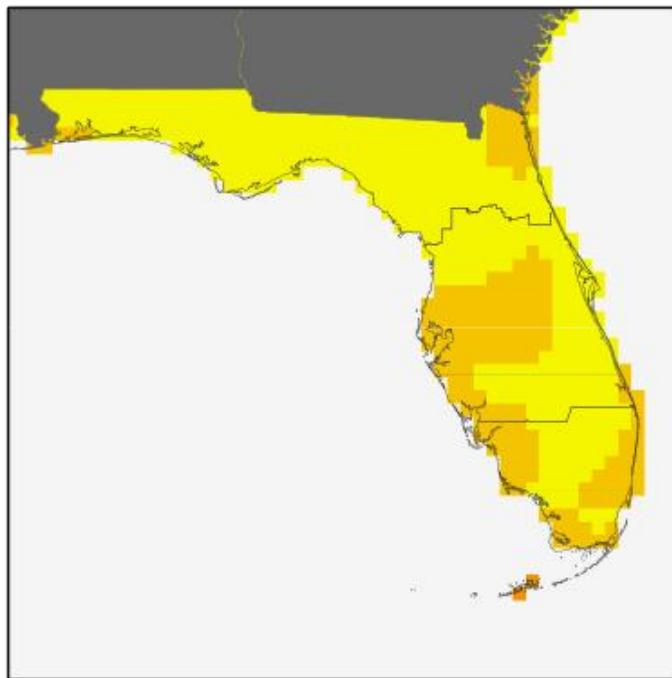
Present

2050

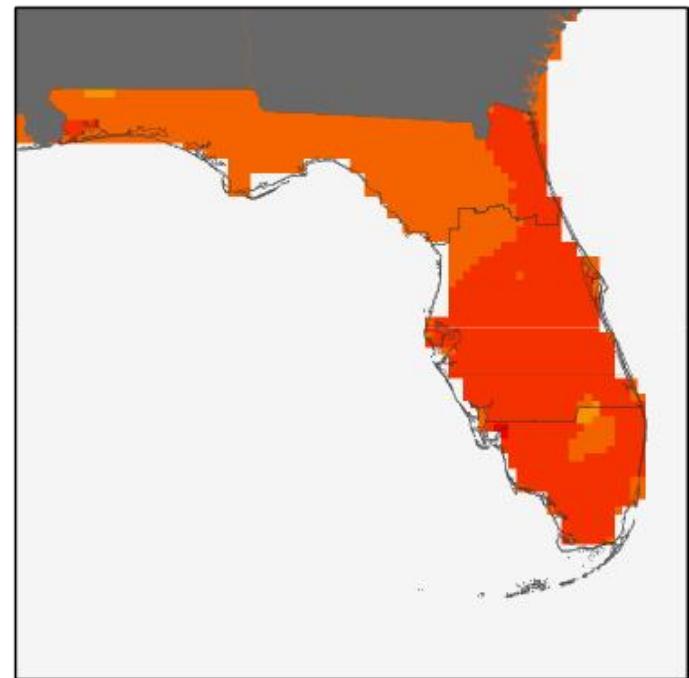


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Present

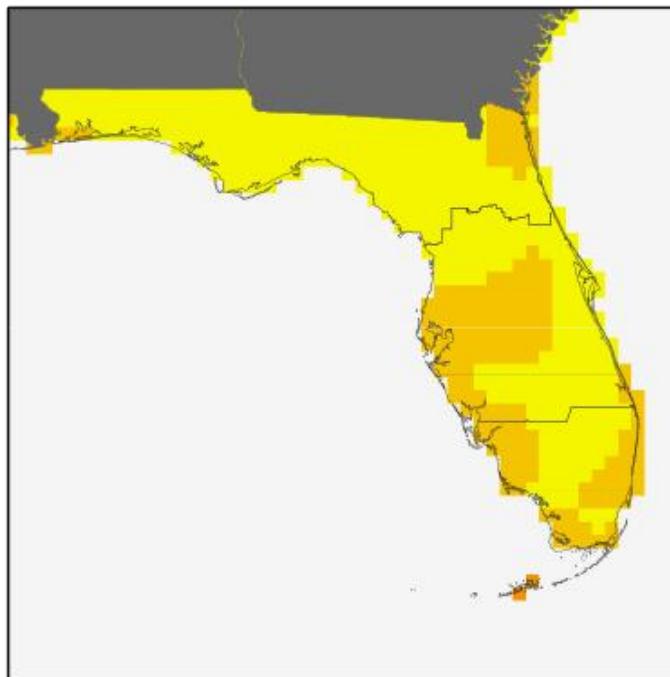


2050

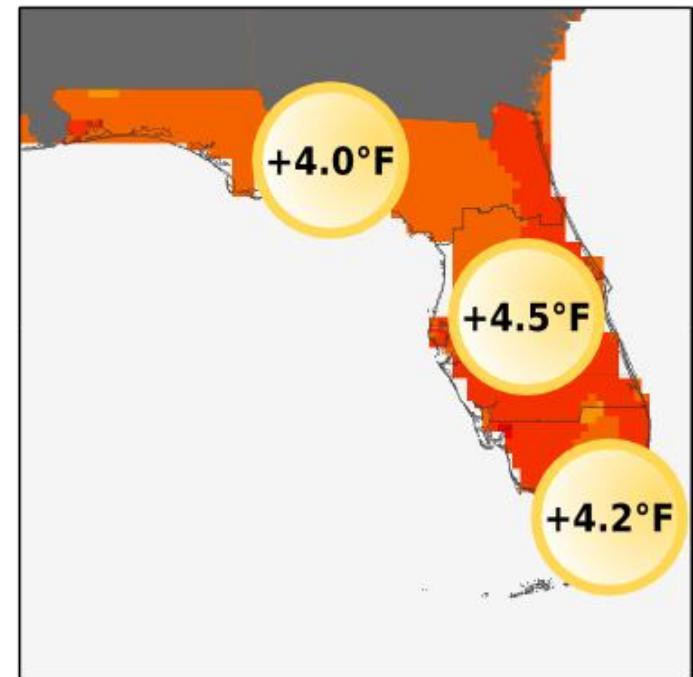


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Present



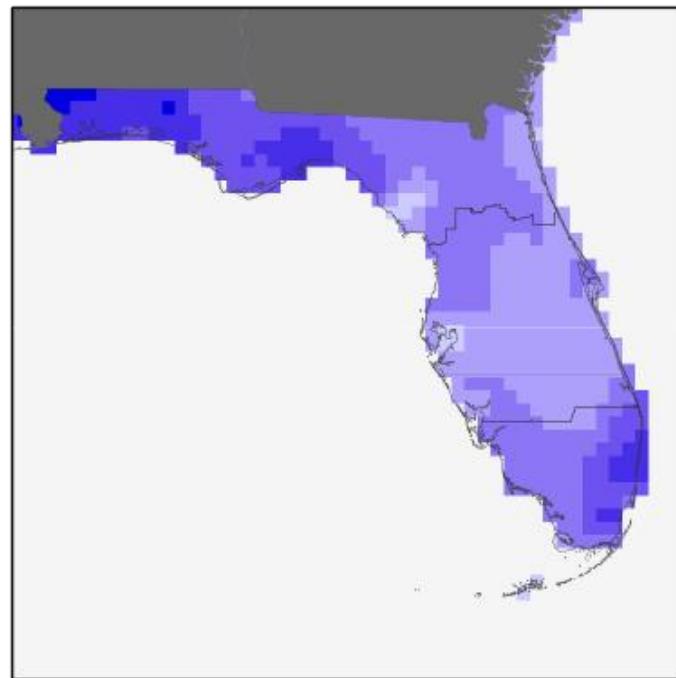
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# WELCOME TO THE TROPICS

Present

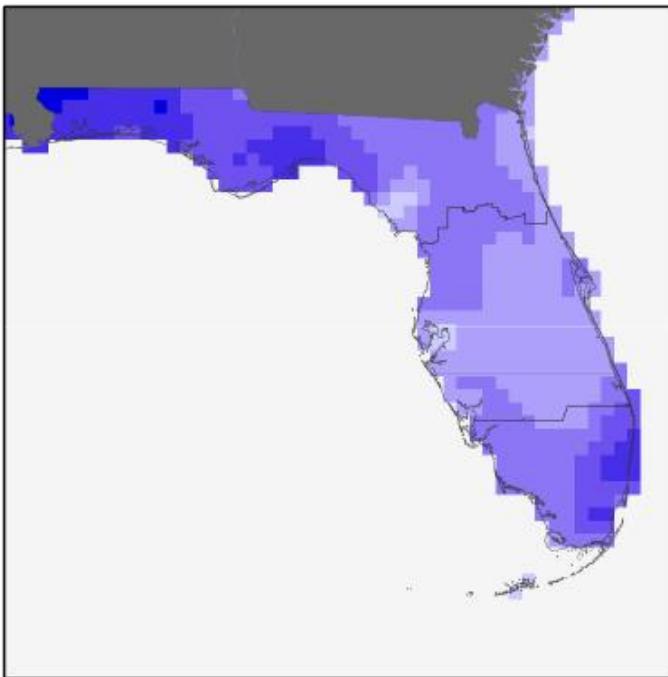
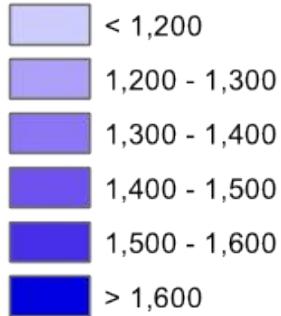
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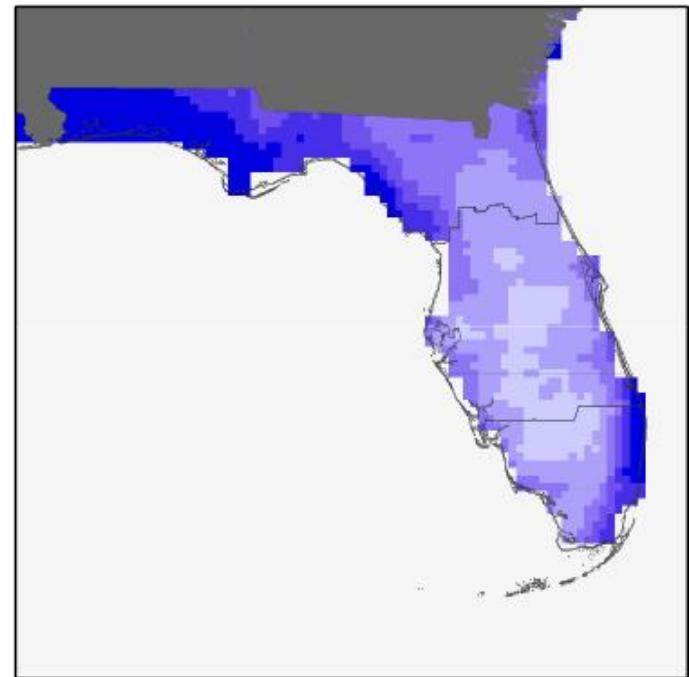
# WELCOME TO THE TROPICS

Present

Annual precipitation (mm)



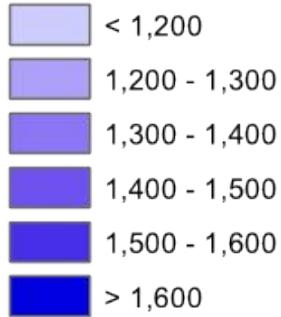
2050



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Present

Annual precipitation (mm)



2050

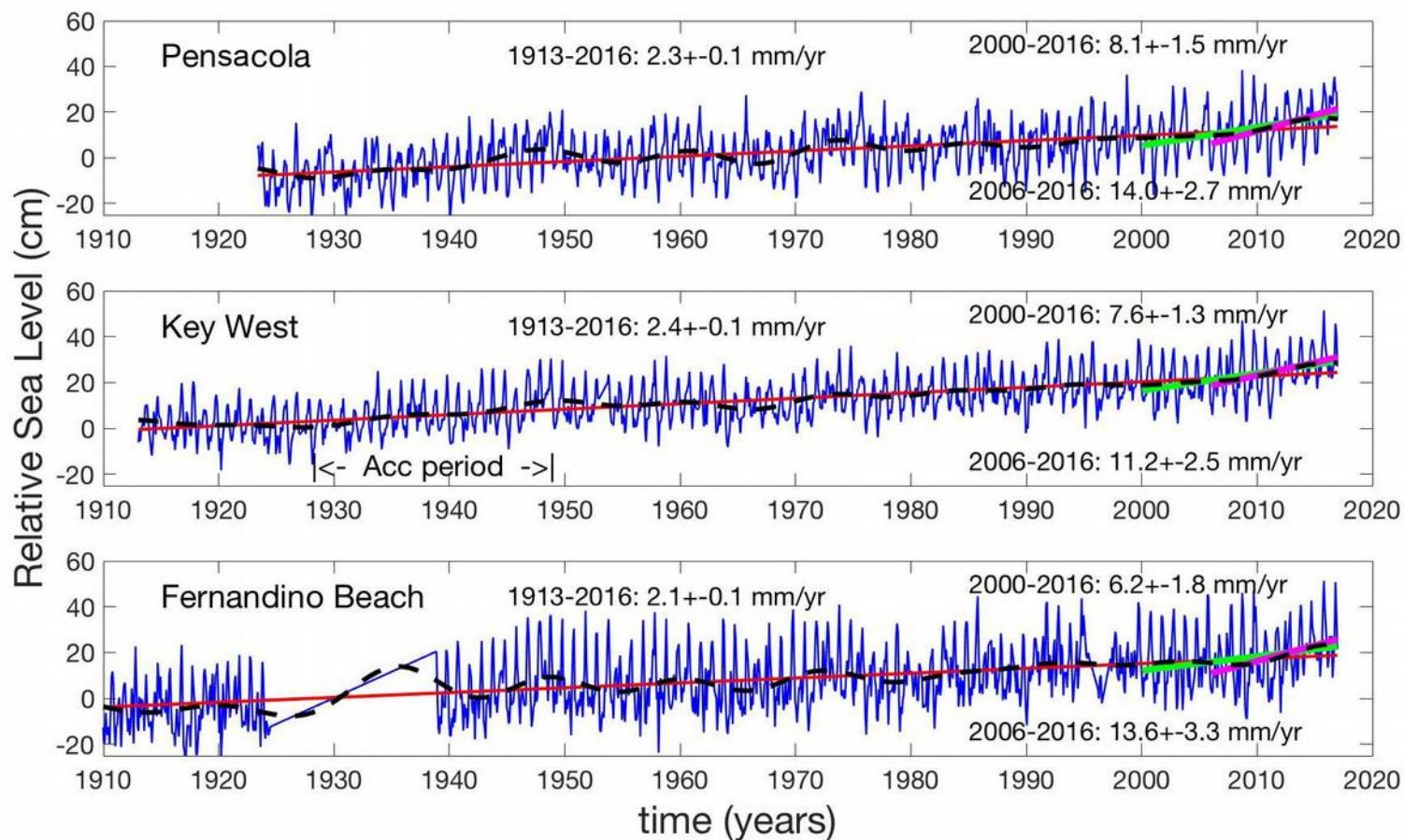
+3.5"

-1.3"

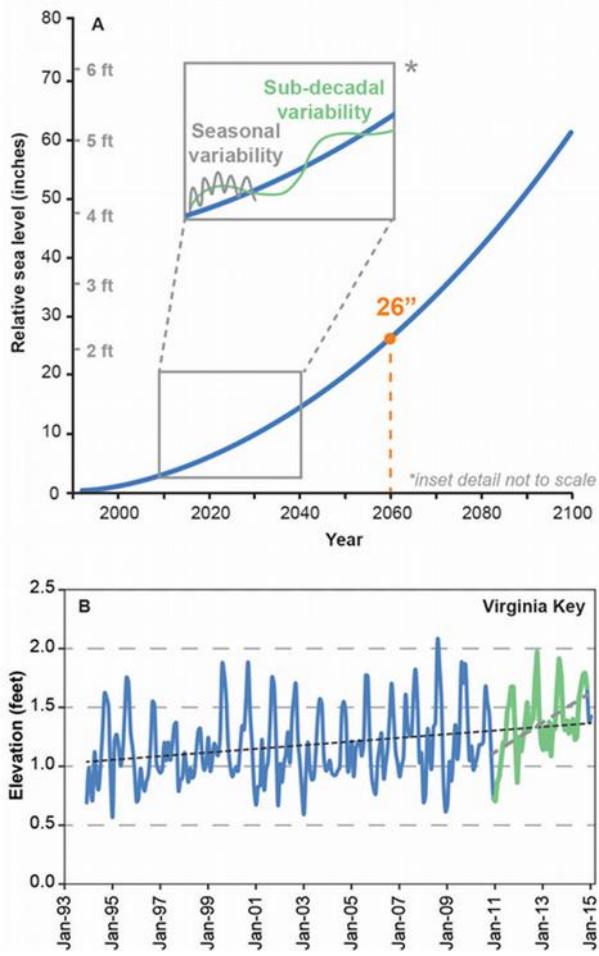
-3.1"

UF

# FLORIDA IS DROWNING LITTLE BY LITTLE...

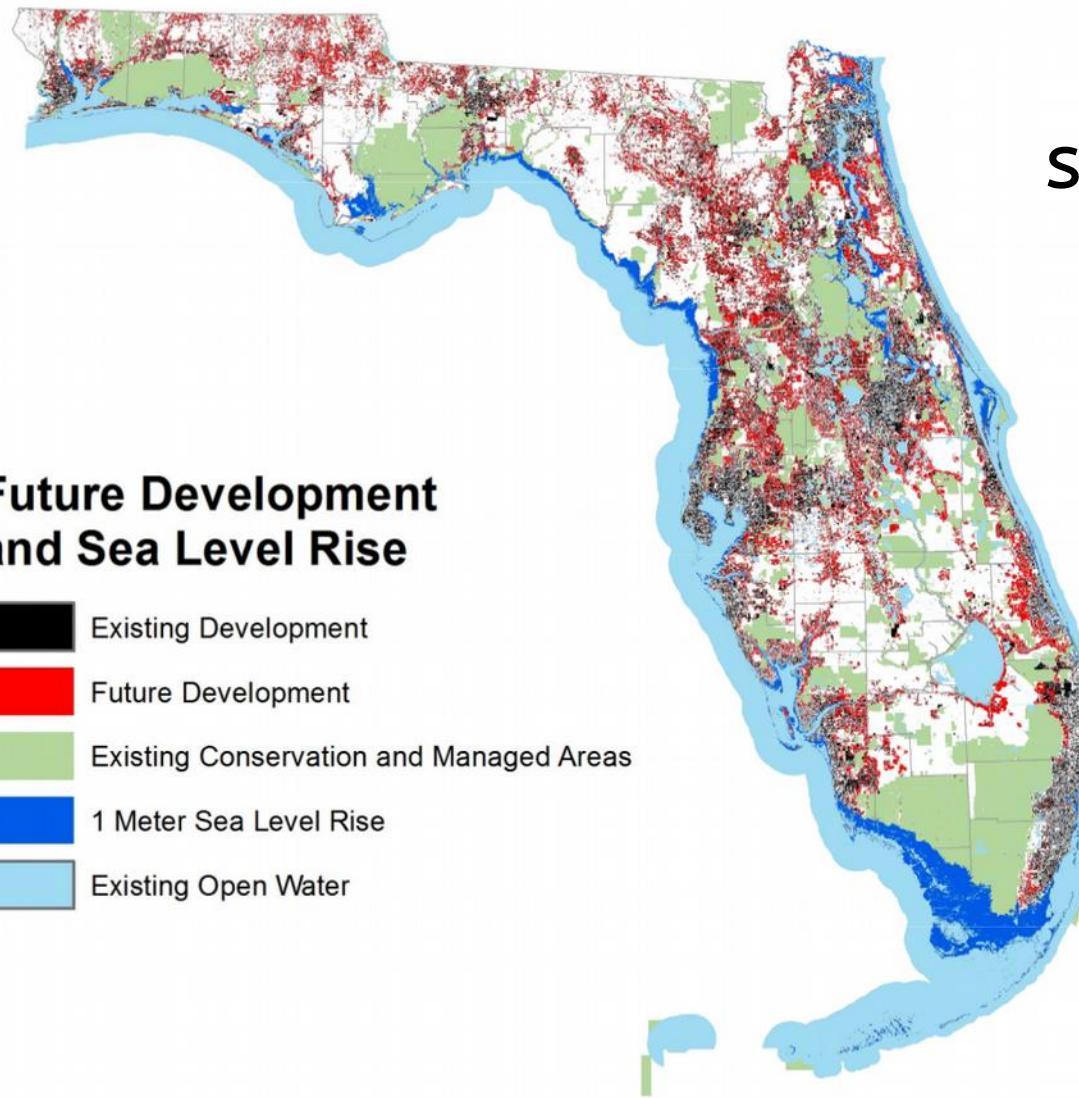


# FLORIDA IS DROWNING LITTLE BY LITTLE...



UF

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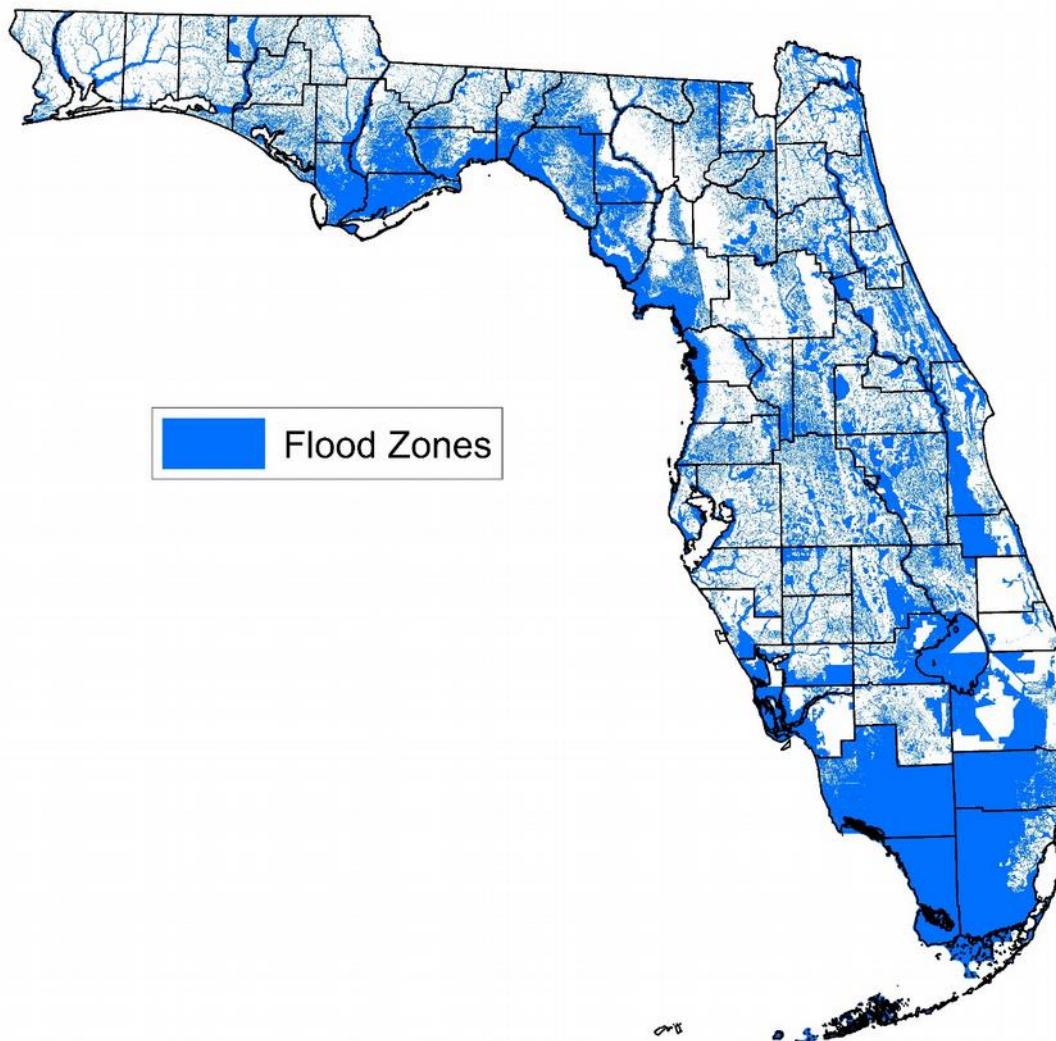
1-m (3 feet)  
Sea-level rise

## Future Development and Sea Level Rise

- Existing Development
- Future Development
- Existing Conservation and Managed Areas
- 1 Meter Sea Level Rise
- Existing Open Water

UF

# FLORIDA IS DROWNING LITTLE BY LITTLE...



UF

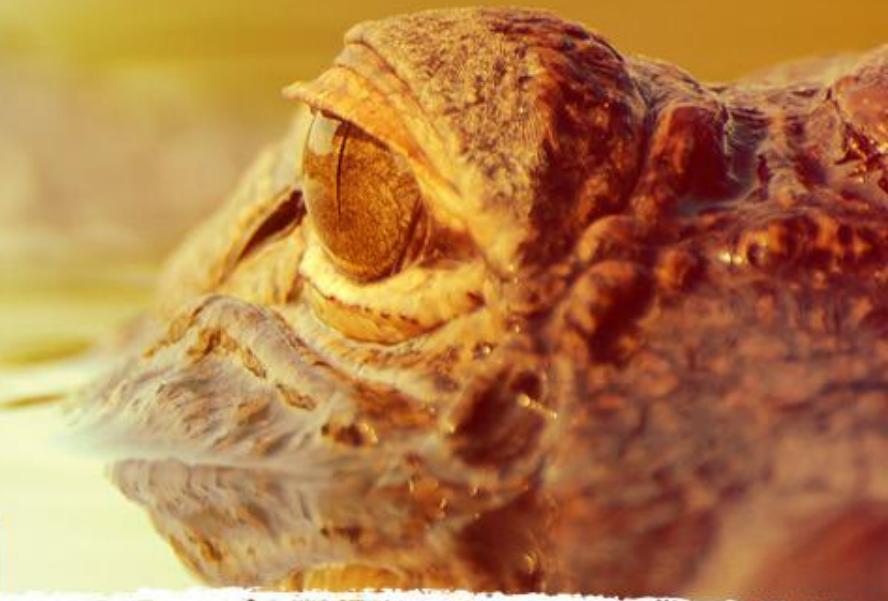
# WHY DO WE CARE?

- 54 federally threatened and endangered terrestrial (T&E) vertebrate species
- 111 imperiled vertebrate species in Florida (State)



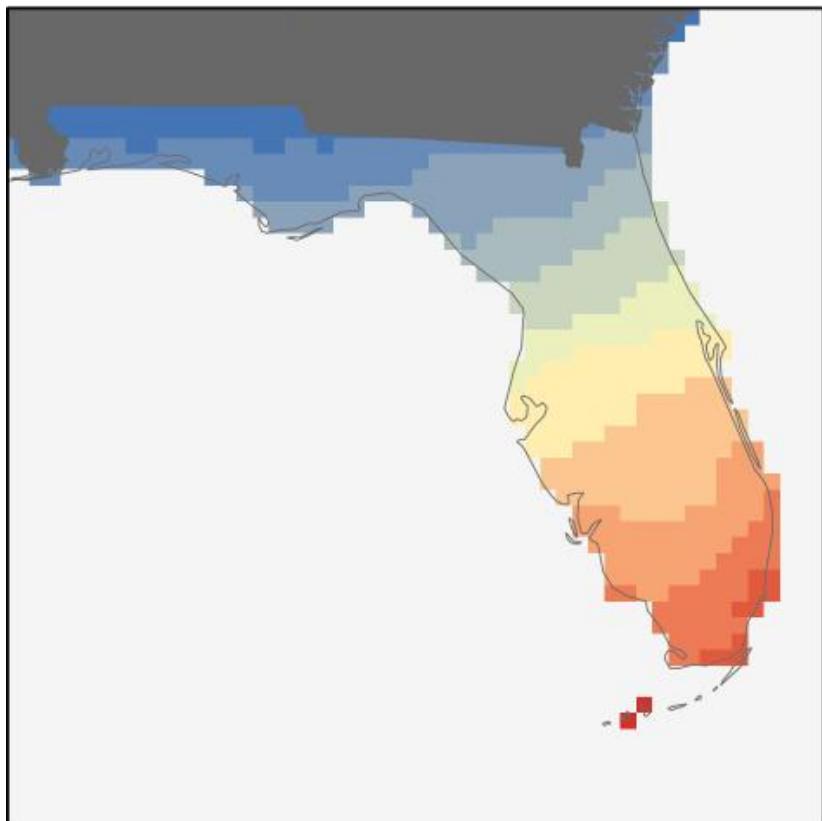


# *THREATENED AND ENDANGERED SPECIES IN THE EVERGLADES*



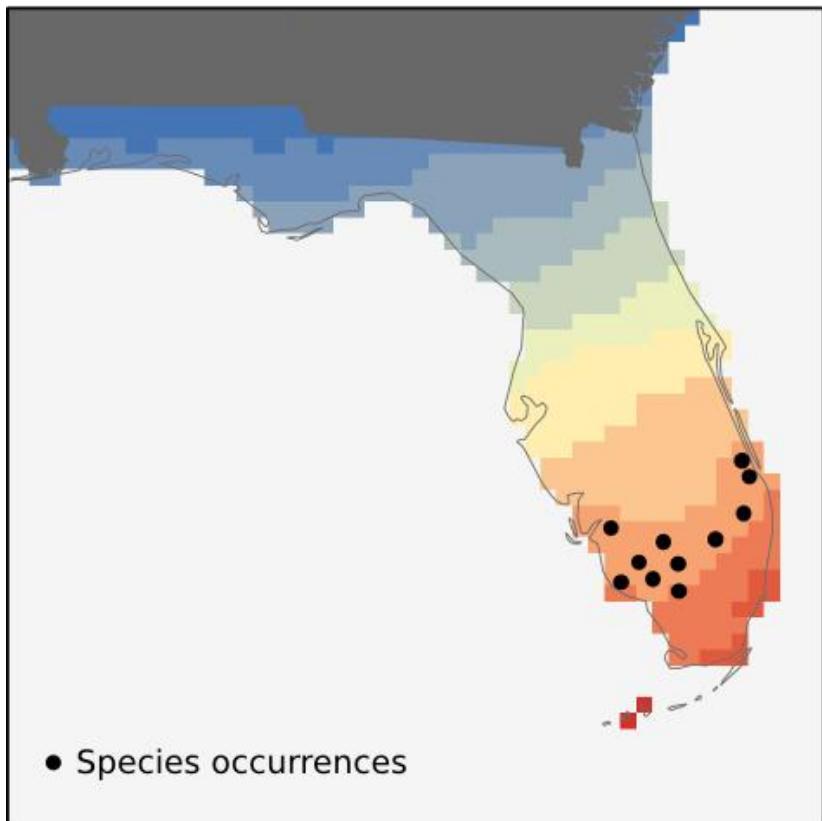
# SPECIES DISTRIBUTION MODELS

Present



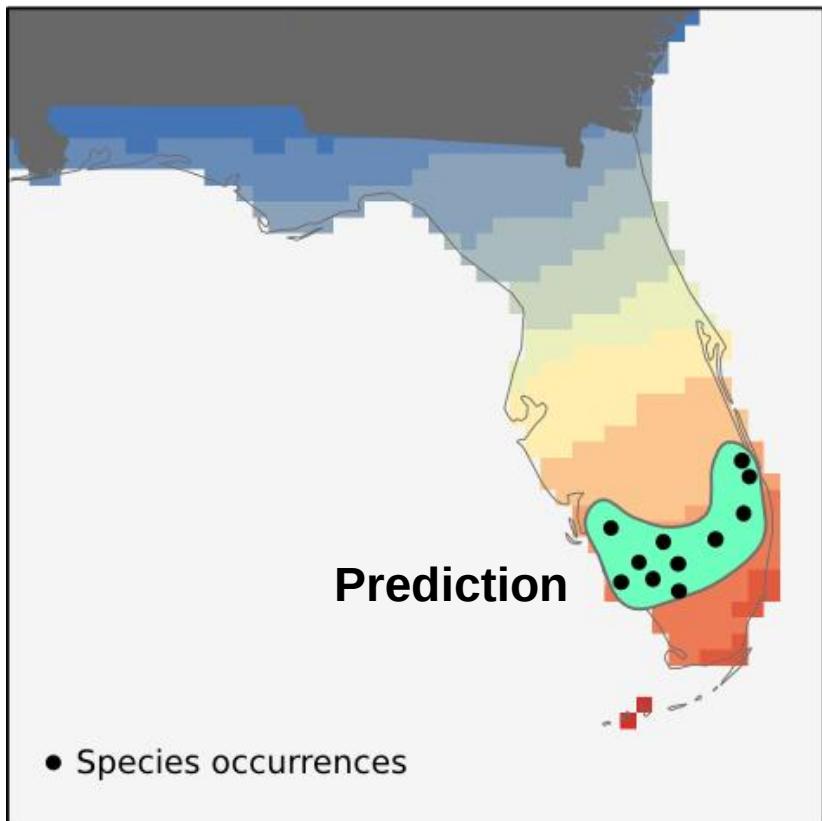
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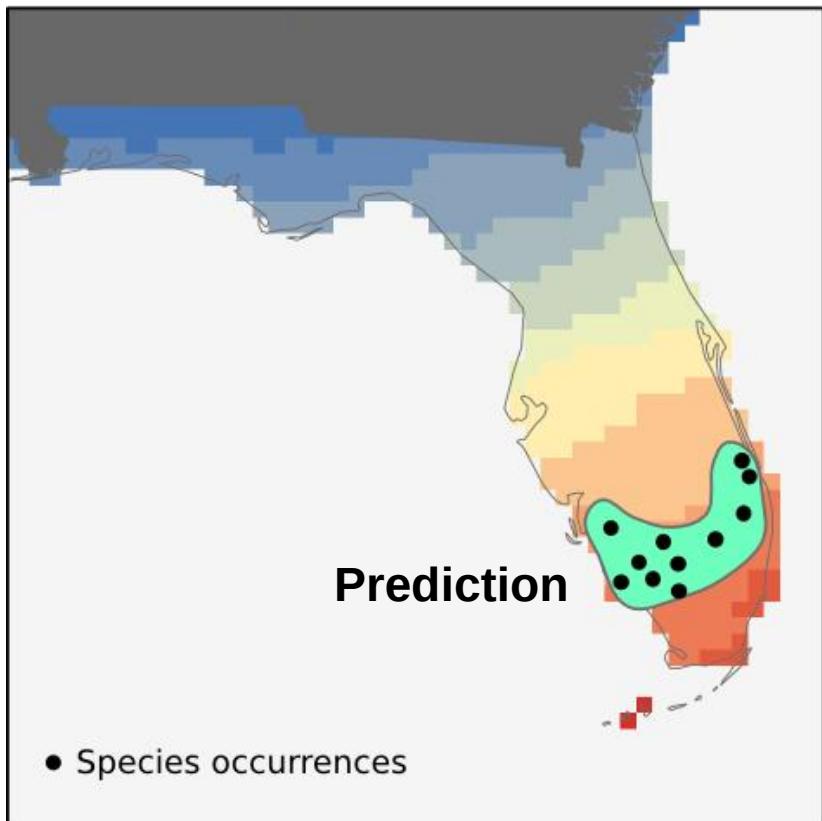
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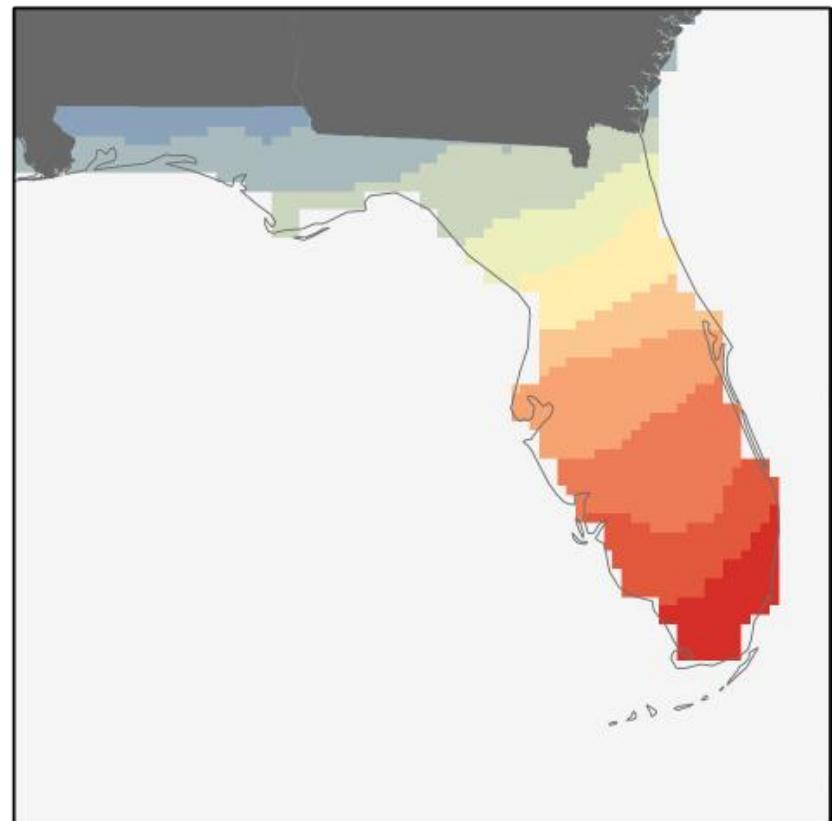


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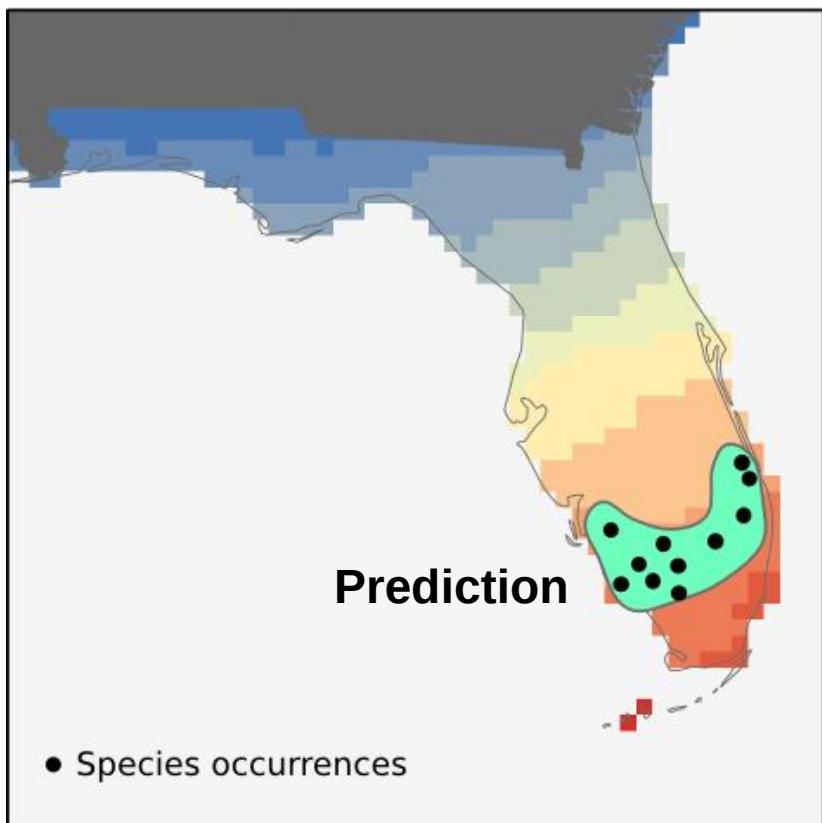


2050

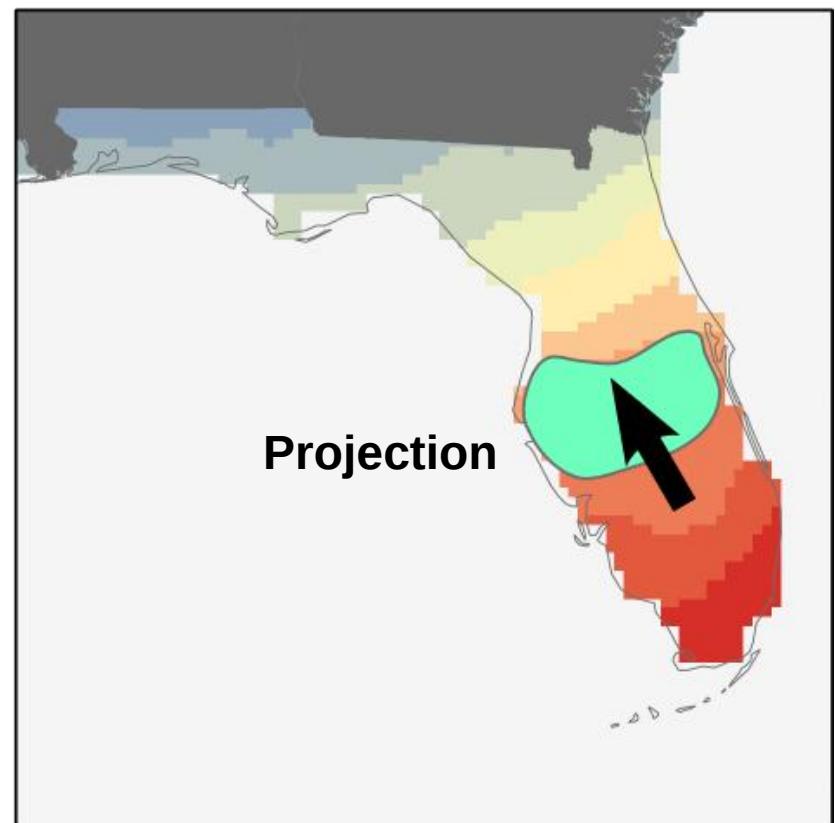


# SPECIES DISTRIBUTION MODELS

Present



2050



# WILDLIFE IN SOUTH FLORIDA

American  
crocodile



UF

# WILDLIFE IN SOUTH FLORIDA



Current range



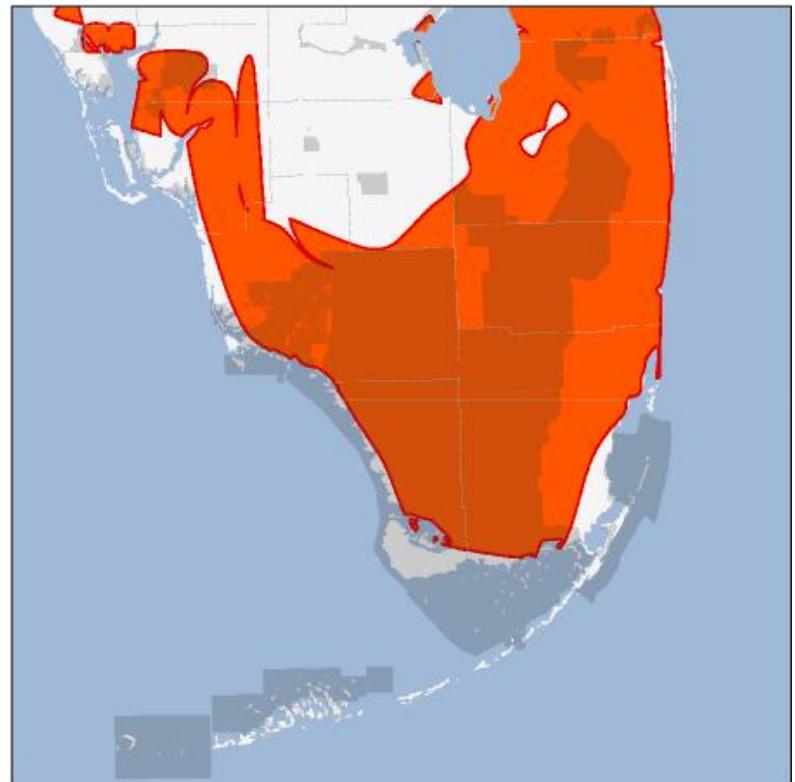
# WILDLIFE IN SOUTH FLORIDA



Current range



2060



# WILDLIFE IN SOUTH FLORIDA

Florida panther

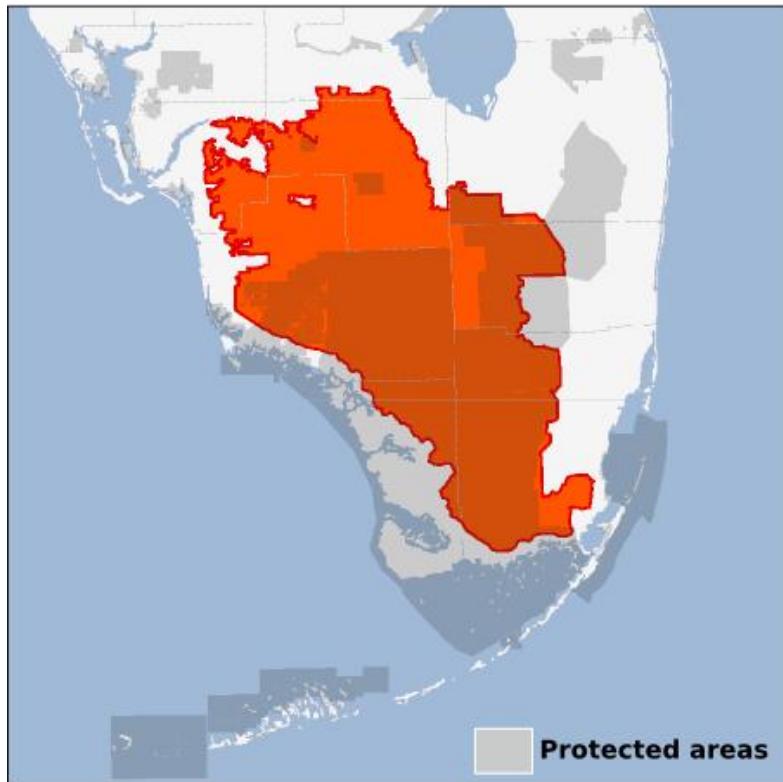


UF



# WILDLIFE IN SOUTH FLORIDA

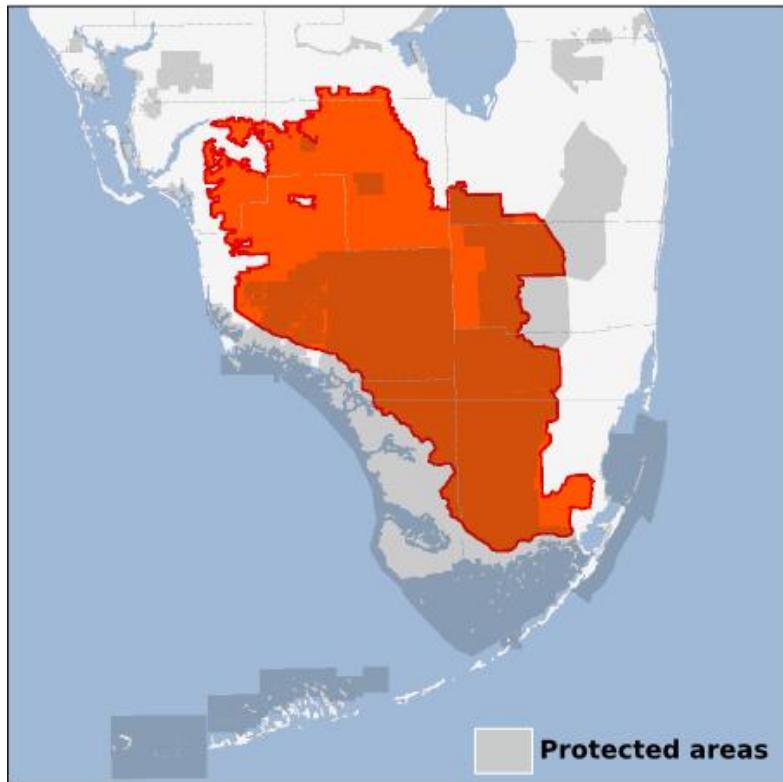
Current range



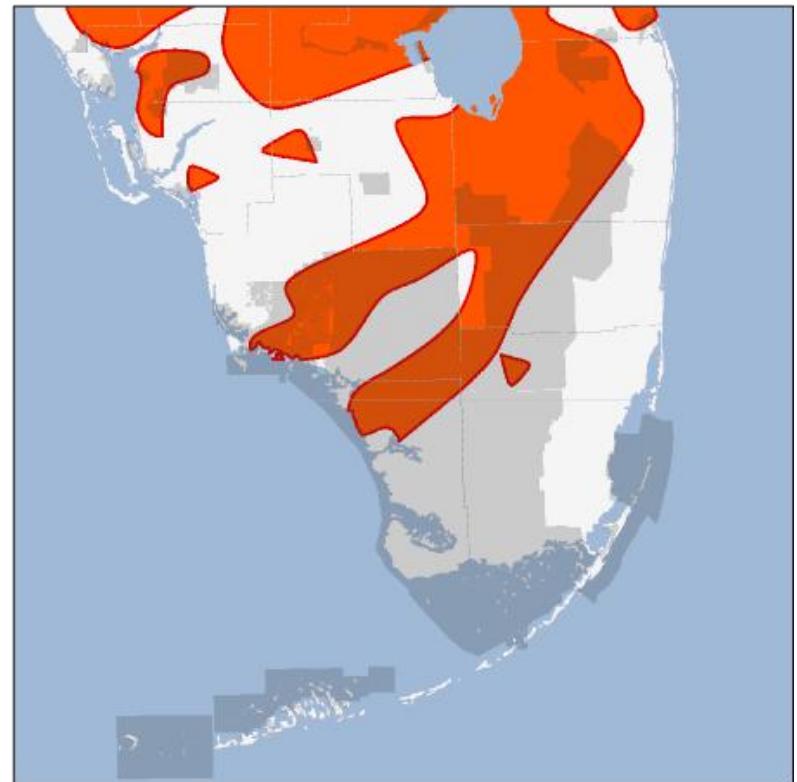


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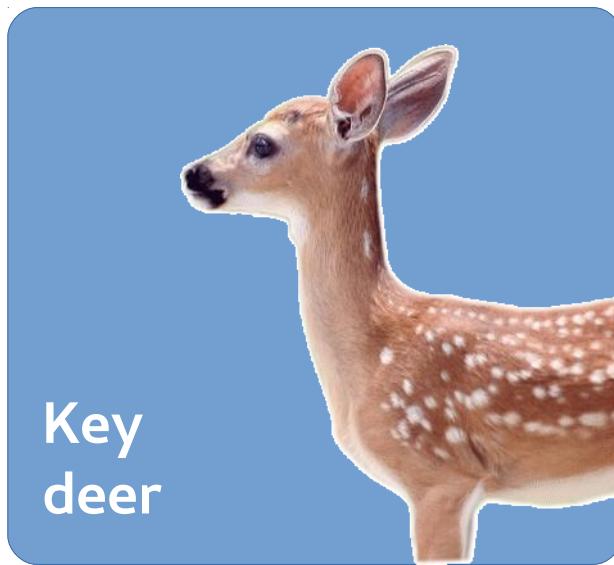
Current range



2060



# WILDLIFE IN SOUTH FLORIDA

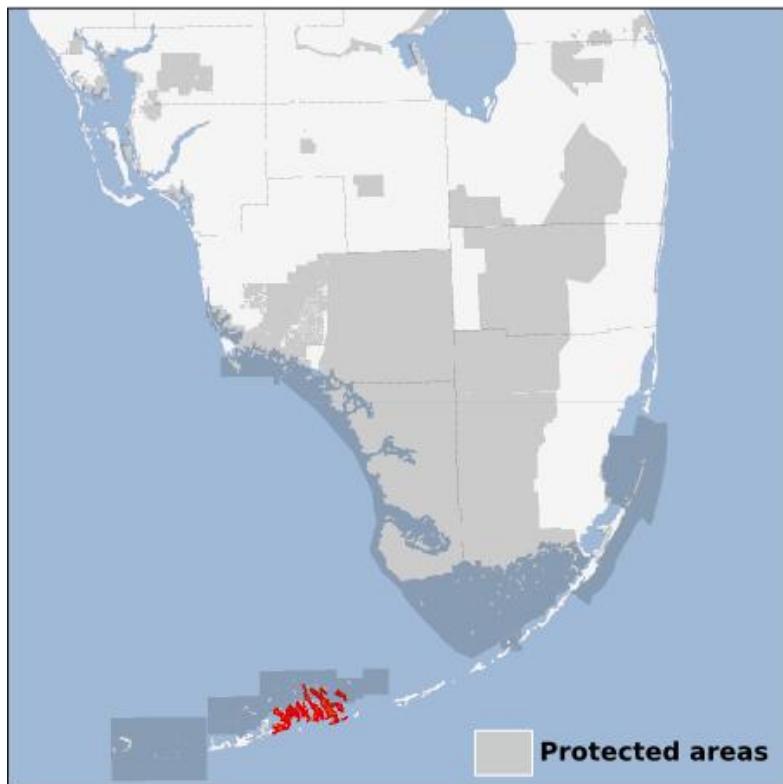


UF

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Current range

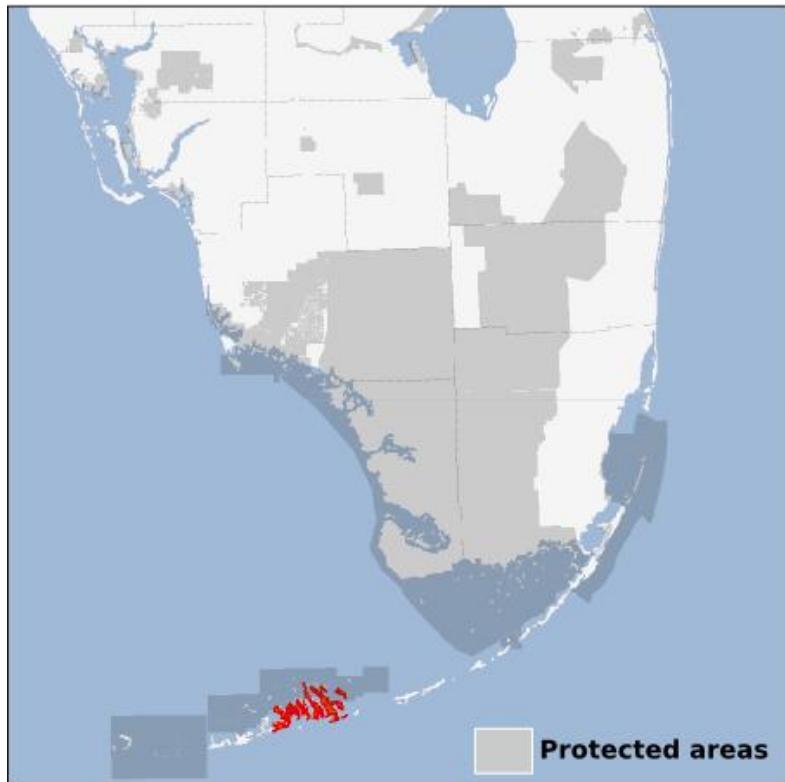


UF

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Current range



2060



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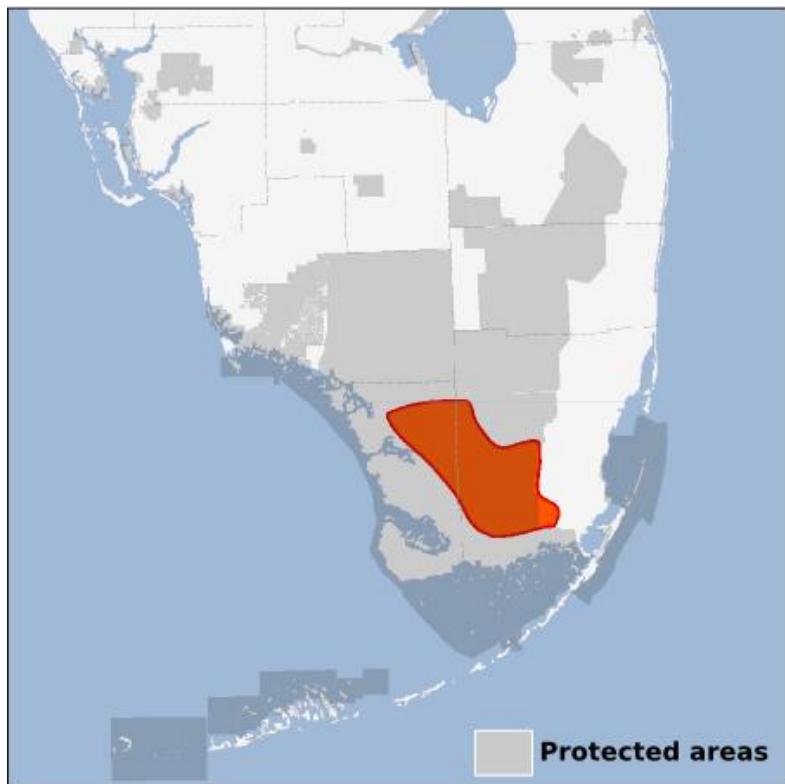
Cape Sable  
seaside sparrow





# WILDLIFE IN SOUTH FLORIDA

Current range

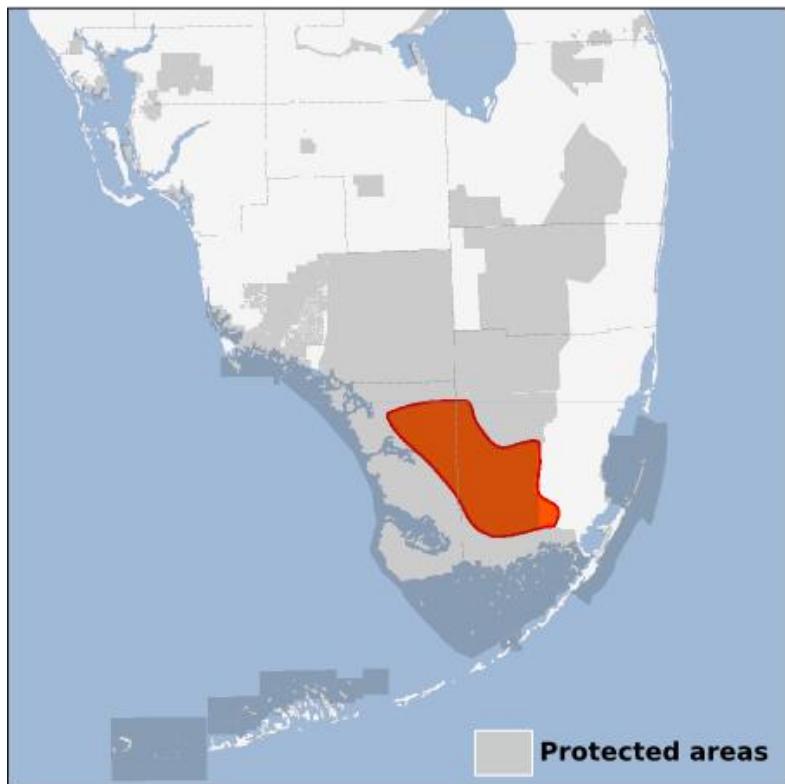


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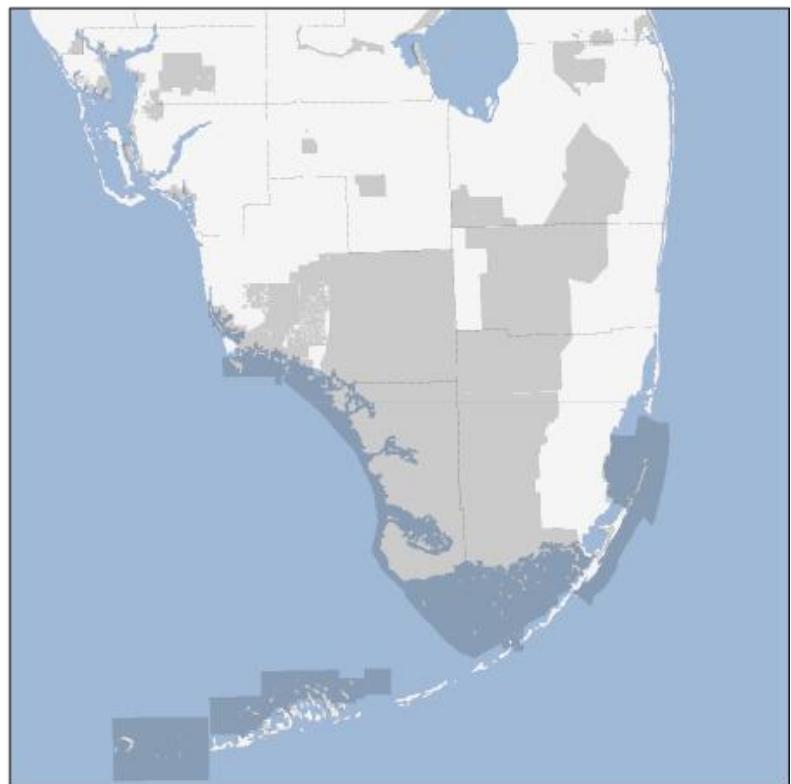


# WILDLIFE IN SOUTH FLORIDA

Current range



2060



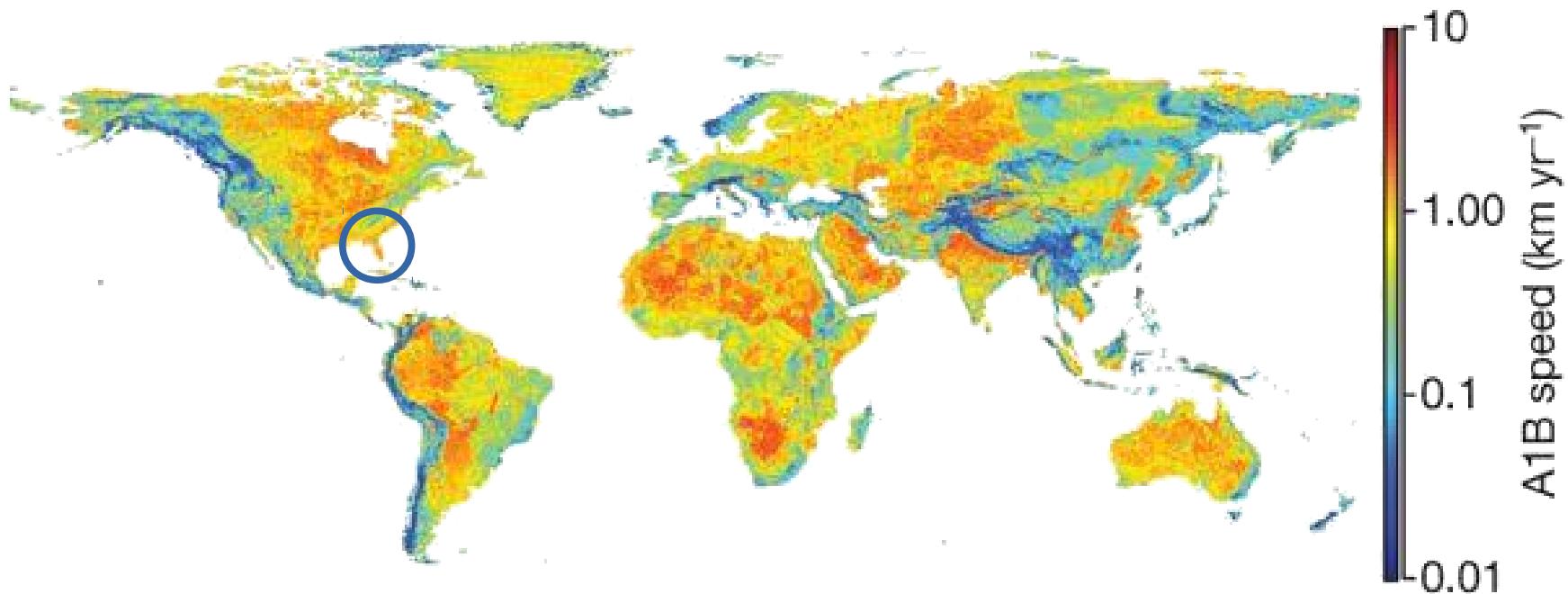


*IS CLIMATE CHANGING MORE RAPIDLY  
THAN SPECIES CAN ADAPT?*



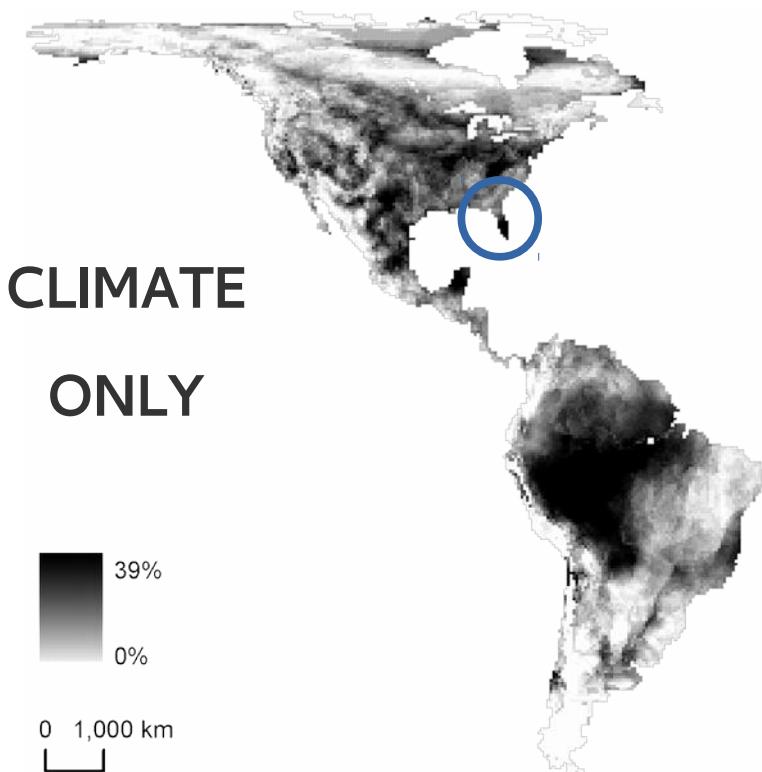
# CLIMATE VELOCITY

2000-2100



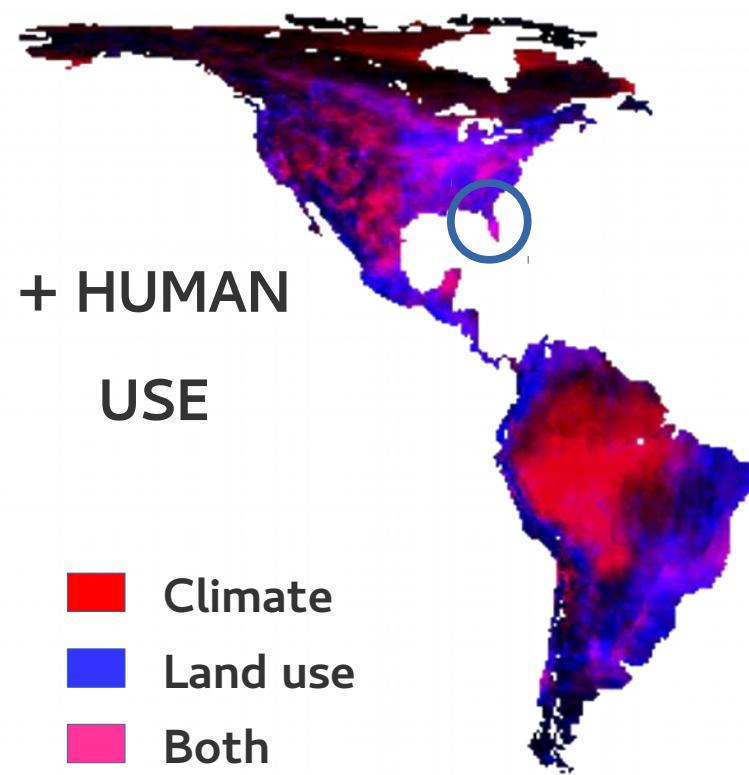
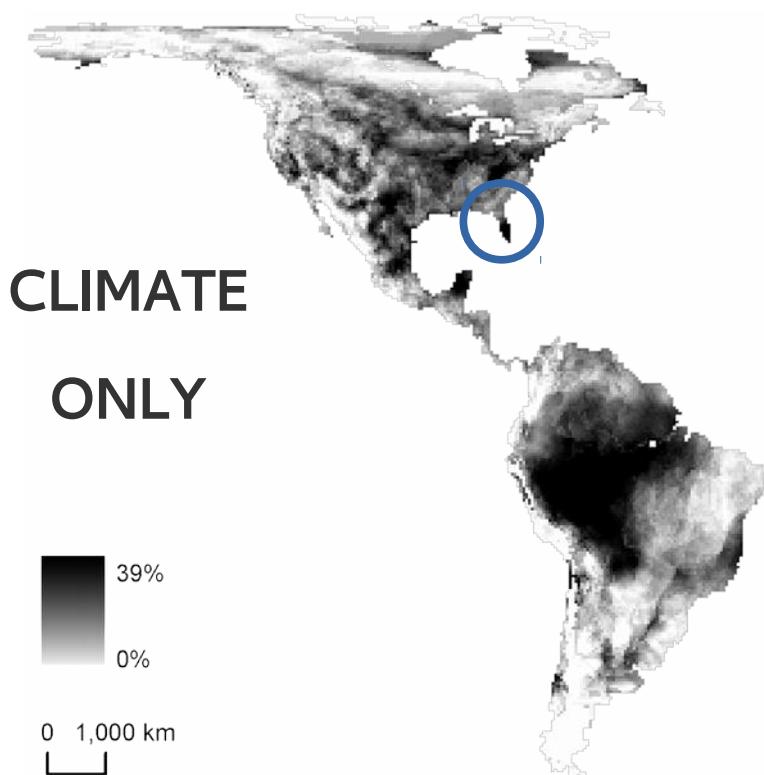
# DISPERSAL VS. GLOBAL CHANGE

Mammals' inability to keep up with change



# DISPERSAL VS. GLOBAL CHANGE

Mammals' inability to keep up with change

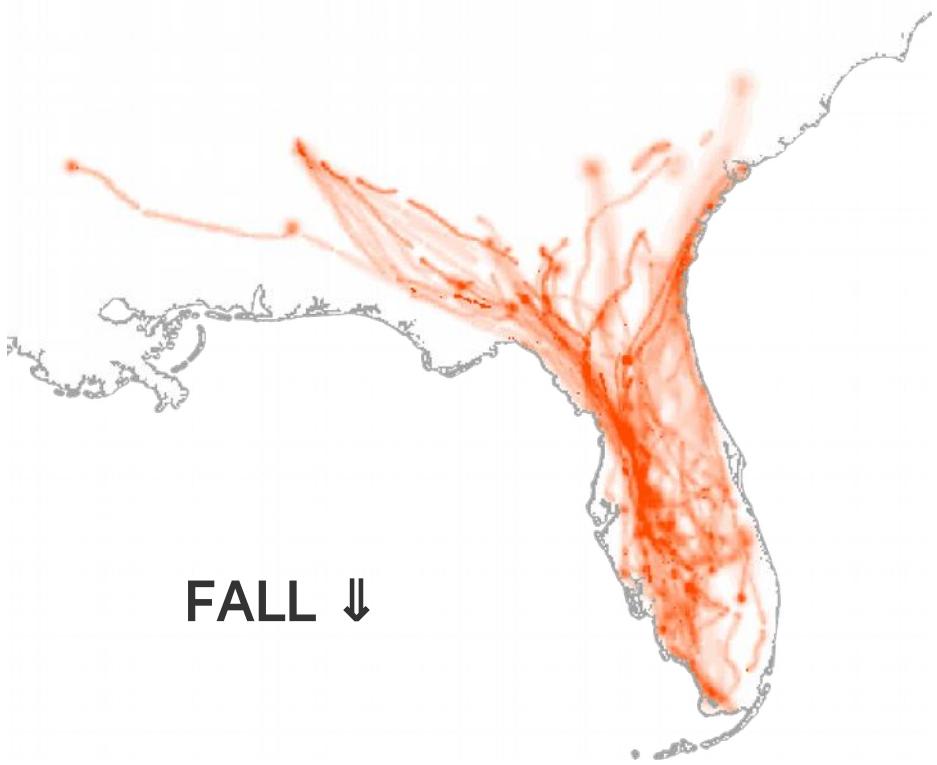


# MOVEMENT CORRIDORS?

Wood stork



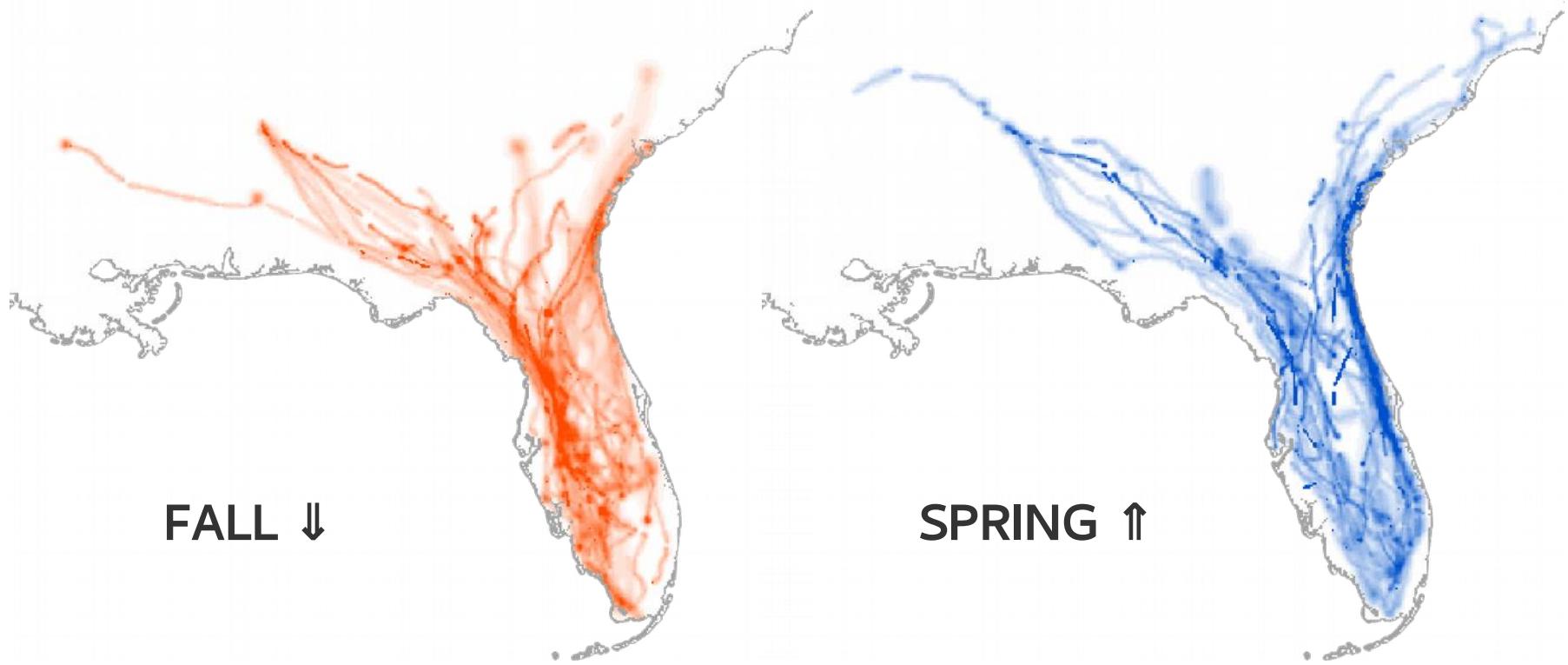
# MOVEMENT CORRIDORS?



FALL ↓

UF

# MOVEMENT CORRIDORS?



FALL ↓

SPRING ↑

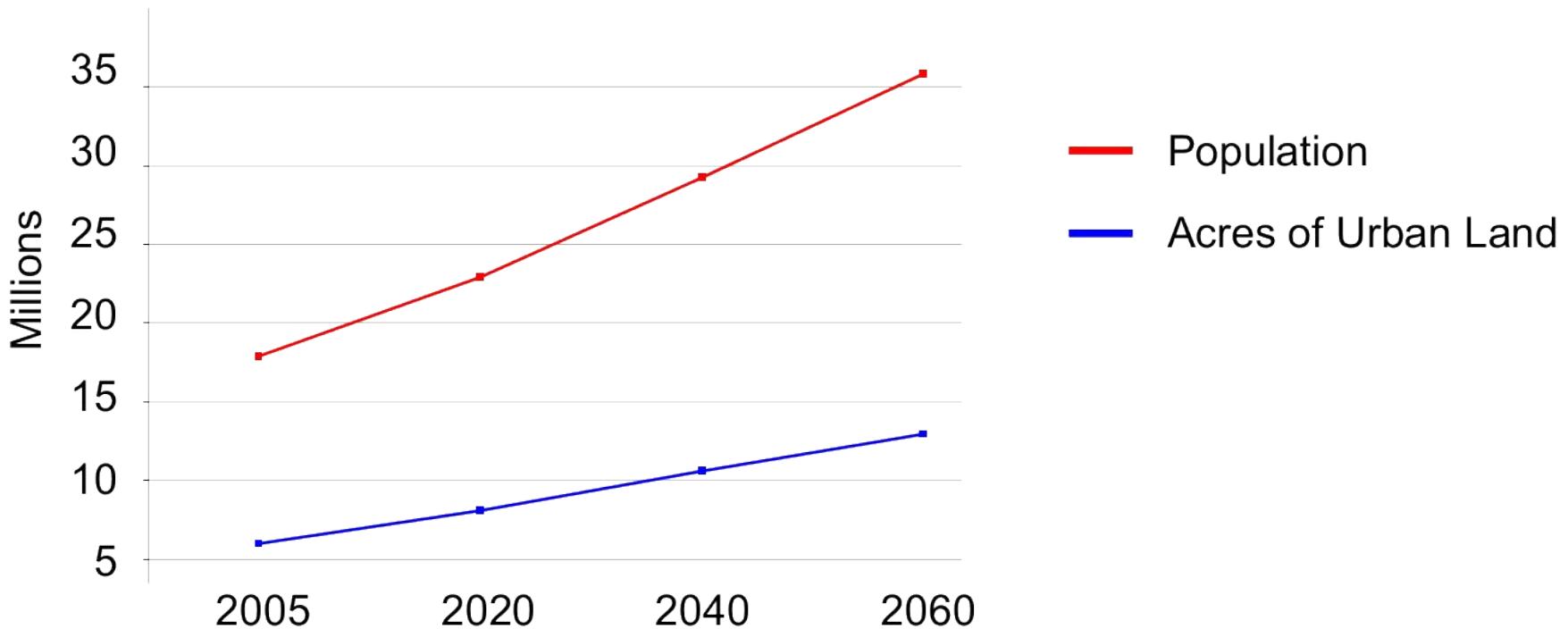
UF



***CLIMATE ONLY?***

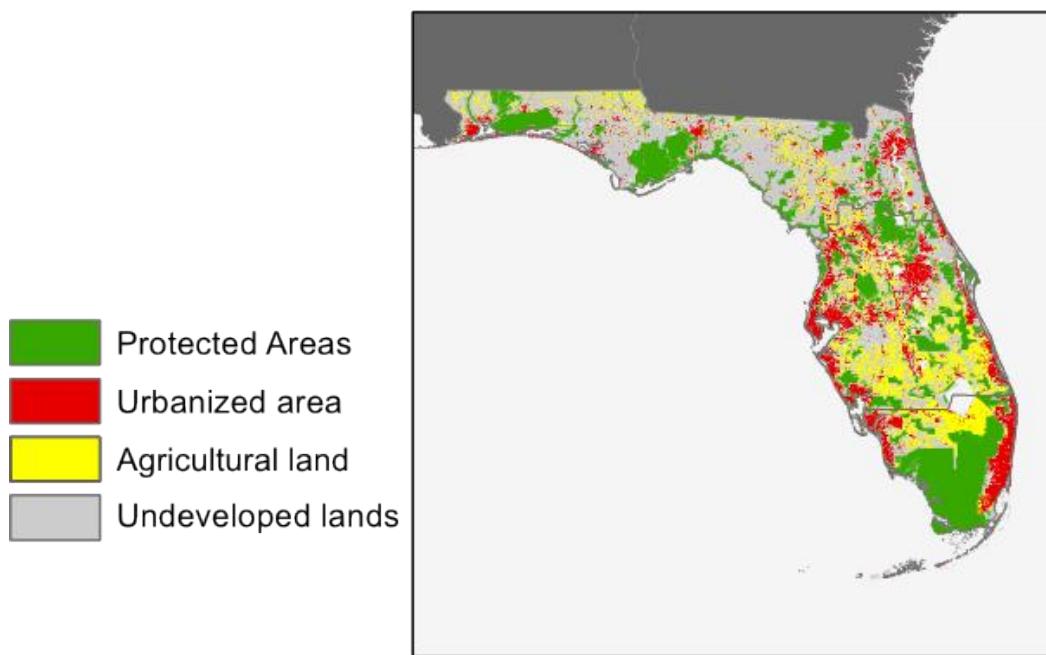


# FLORIDA POPULATION IS GROWING FAST



# SO IS URBANIZATION...

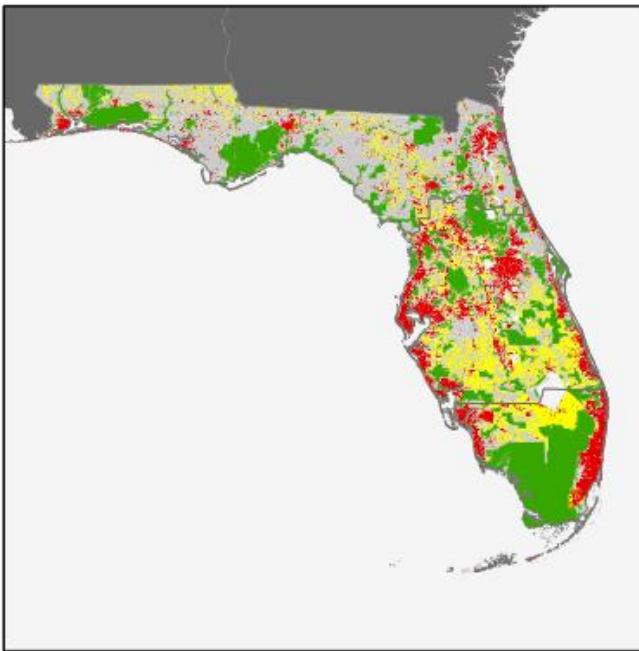
Present



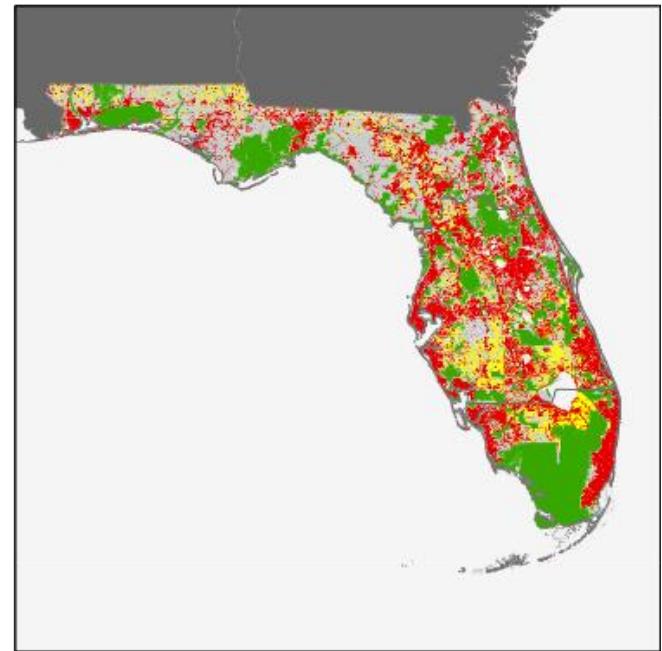
# SO IS URBANIZATION...

Present

- Protected Areas
- Urbanized area
- Agricultural land
- Undeveloped lands



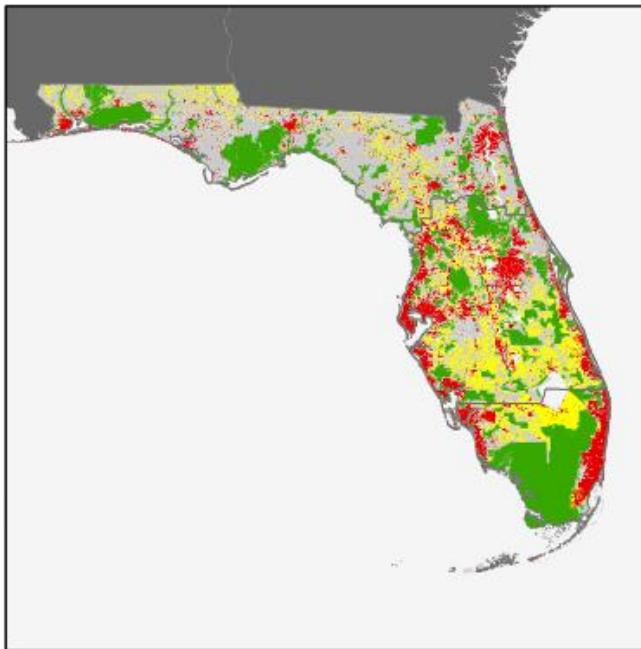
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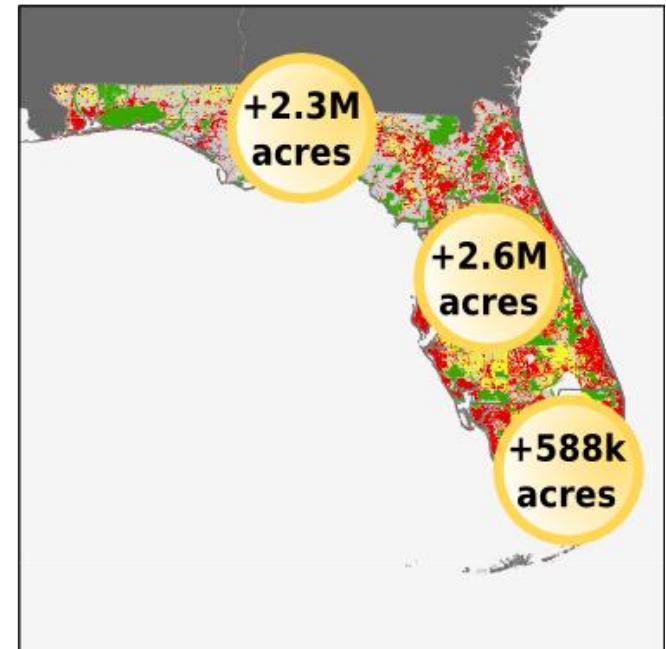
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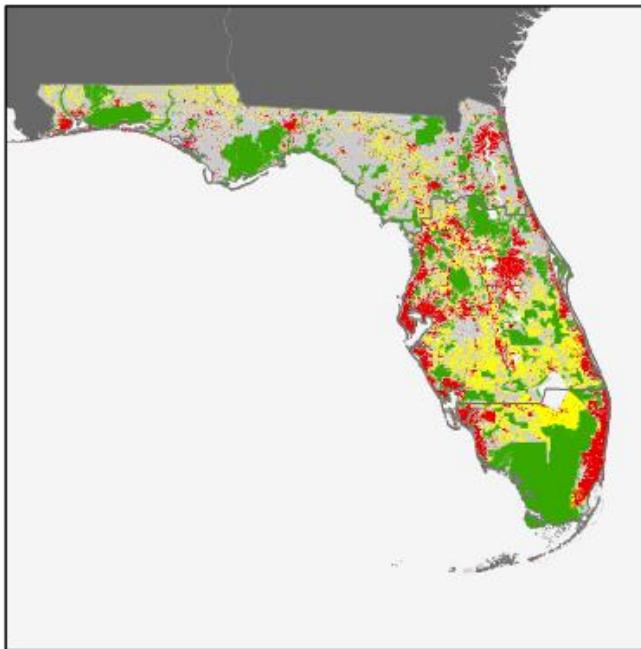
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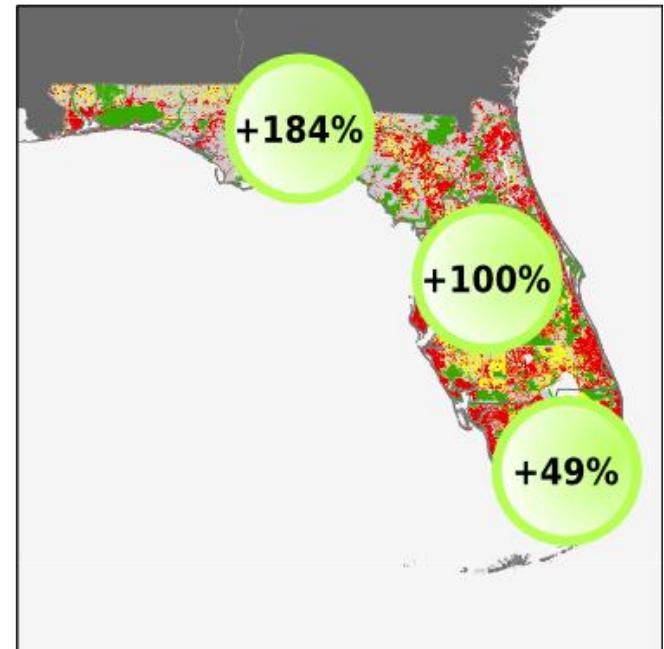
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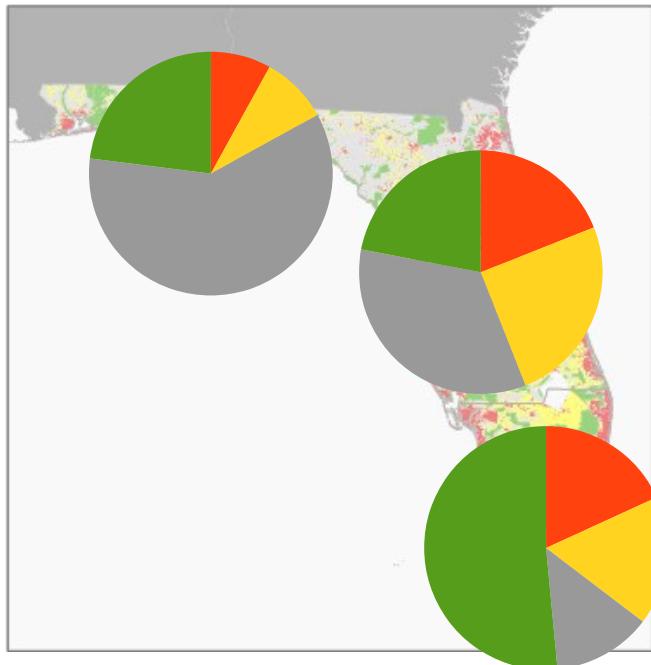
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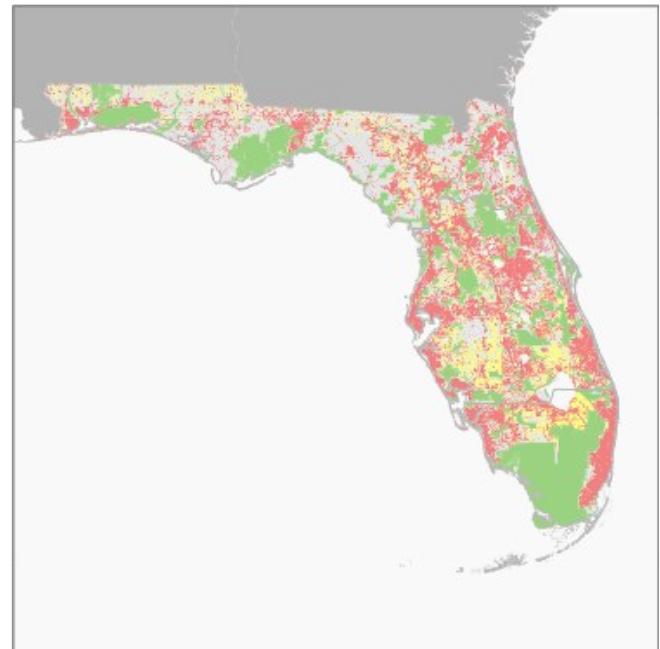
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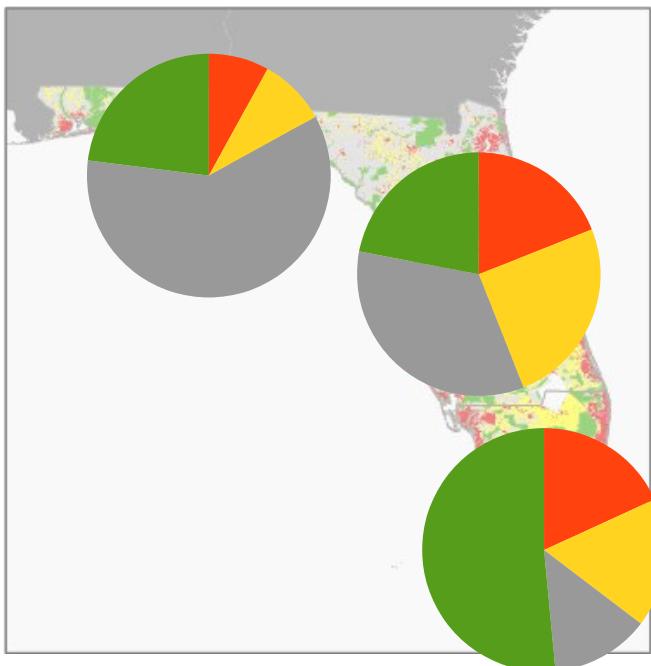
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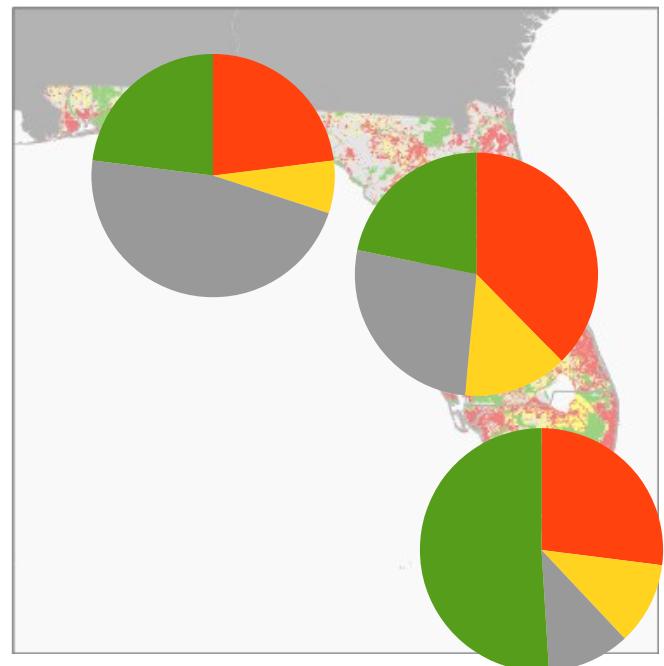
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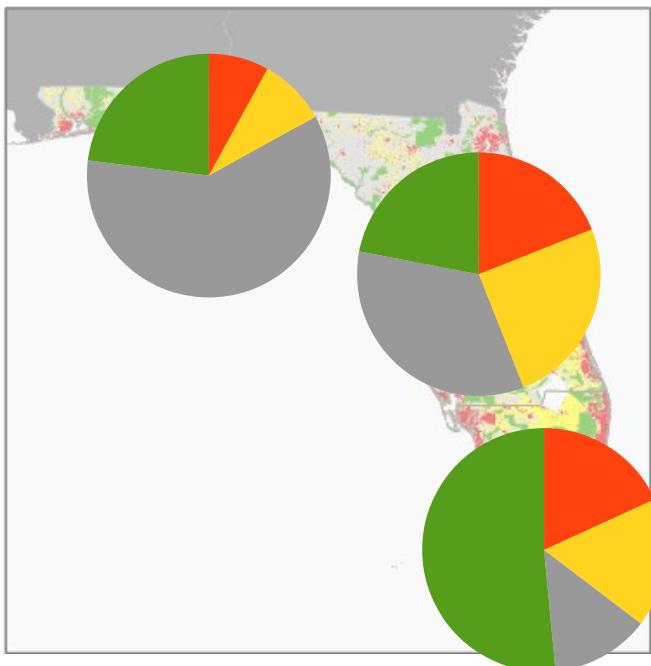
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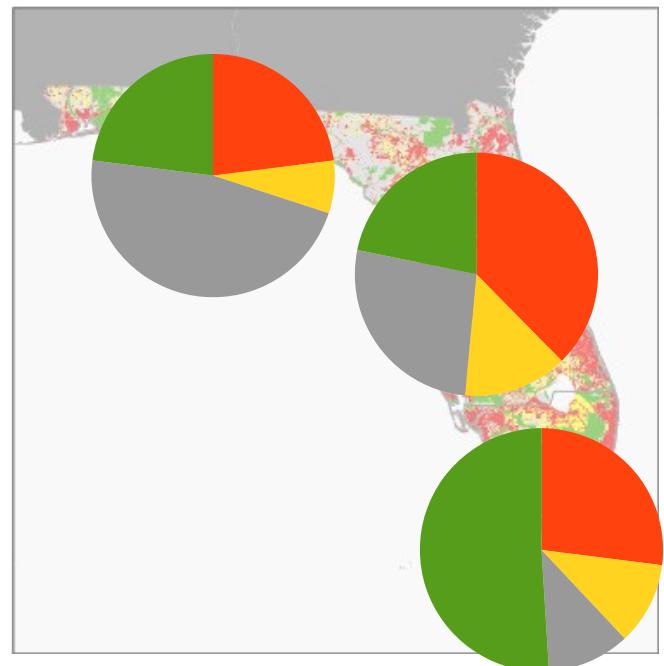
# SO IS URBANIZATION...

Present

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- █ Undeveloped lands



2060



# WILDLIFE IN FLORIDA

Florida black  
bear

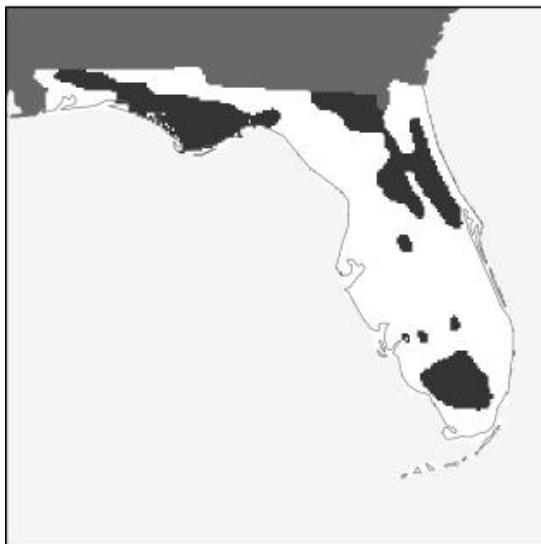


UF

# WILDLIFE IN FLORIDA



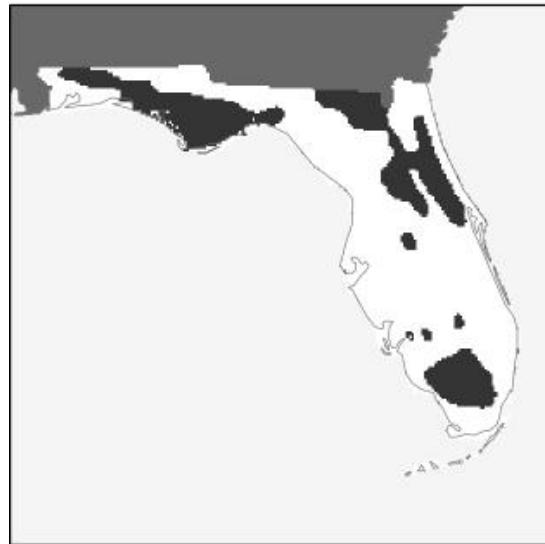
Present range



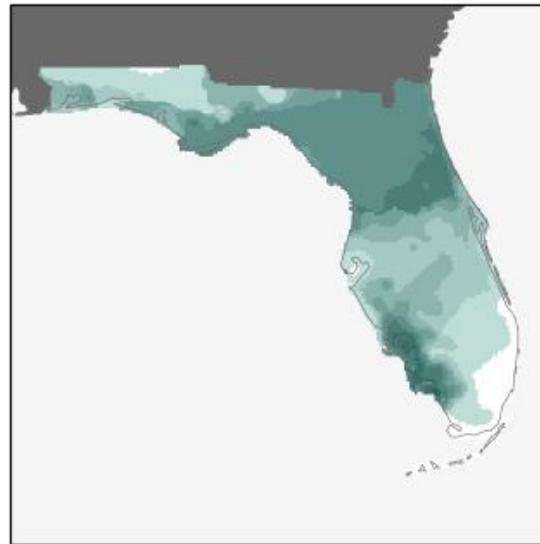
# WILDLIFE IN FLORIDA



Present range



Climate only

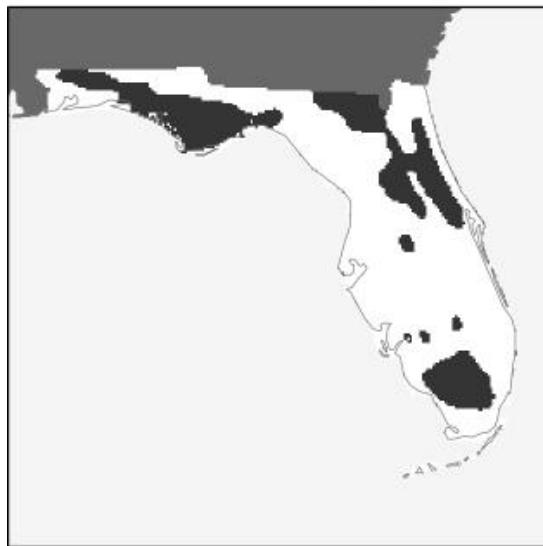


UF

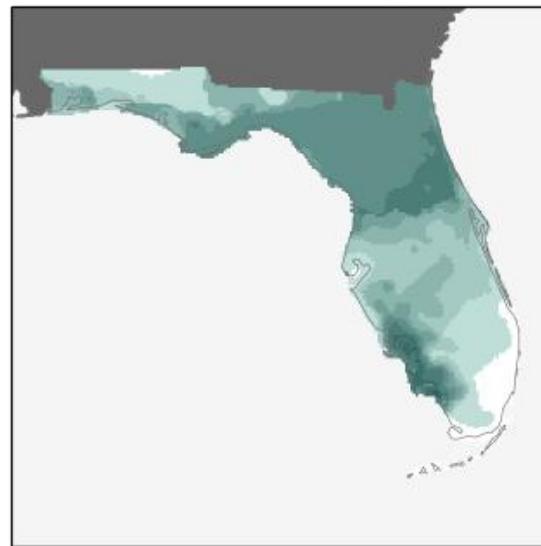
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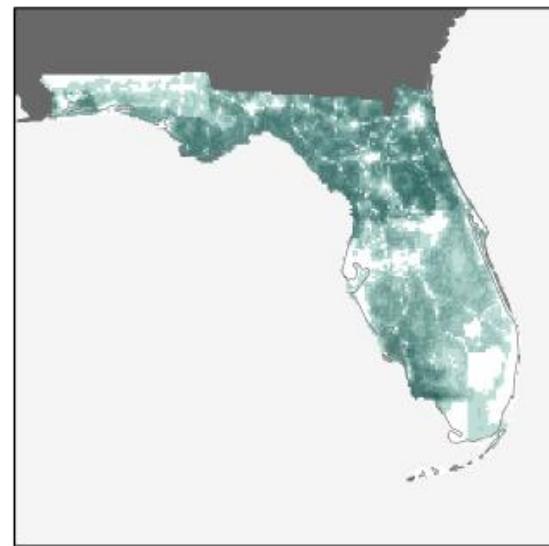
Present range



Climate only



Climate + human influence



# WILDLIFE IN FLORIDA

Florida  
sand skink



UF

# WILDLIFE IN FLORIDA



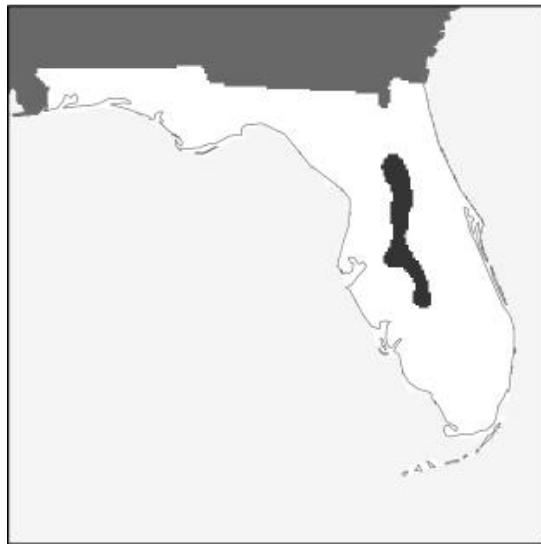
Present range



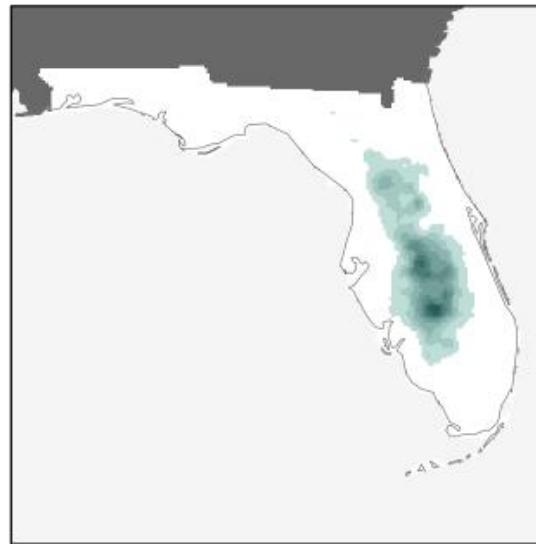
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Present range



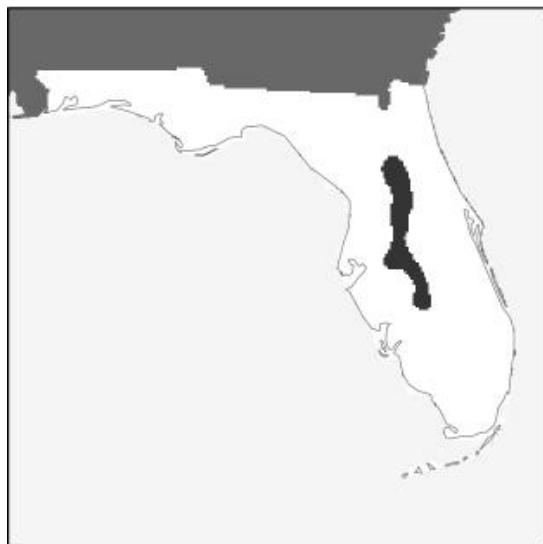
Climate only



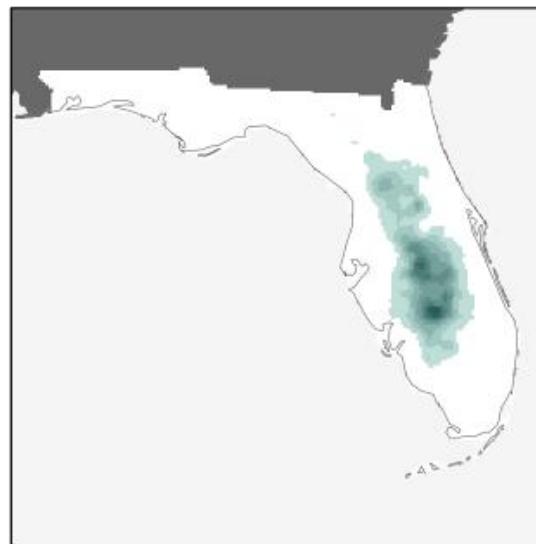
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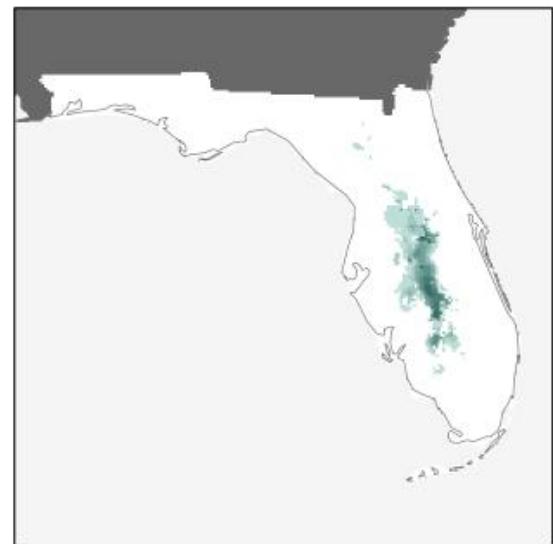
Present range



Climate only



Climate + human influence





*Thanks for your attention!*  
Contact me: [basille@ufl.edu](mailto:basille@ufl.edu)