



ENDANGERED SPECIES OF FLORIDA IN THE FACE OF CLIMATE CHANGE

FOR THE

#GATORGOOD

MATHIEU BASILLE
basille@ufl.edu

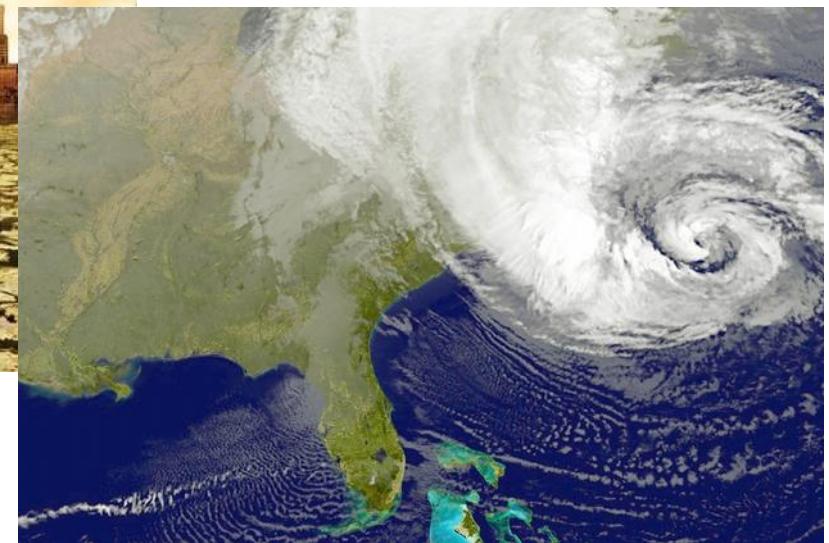
FORT LAUDERDALE RESEARCH AND EDUCATION CENTER



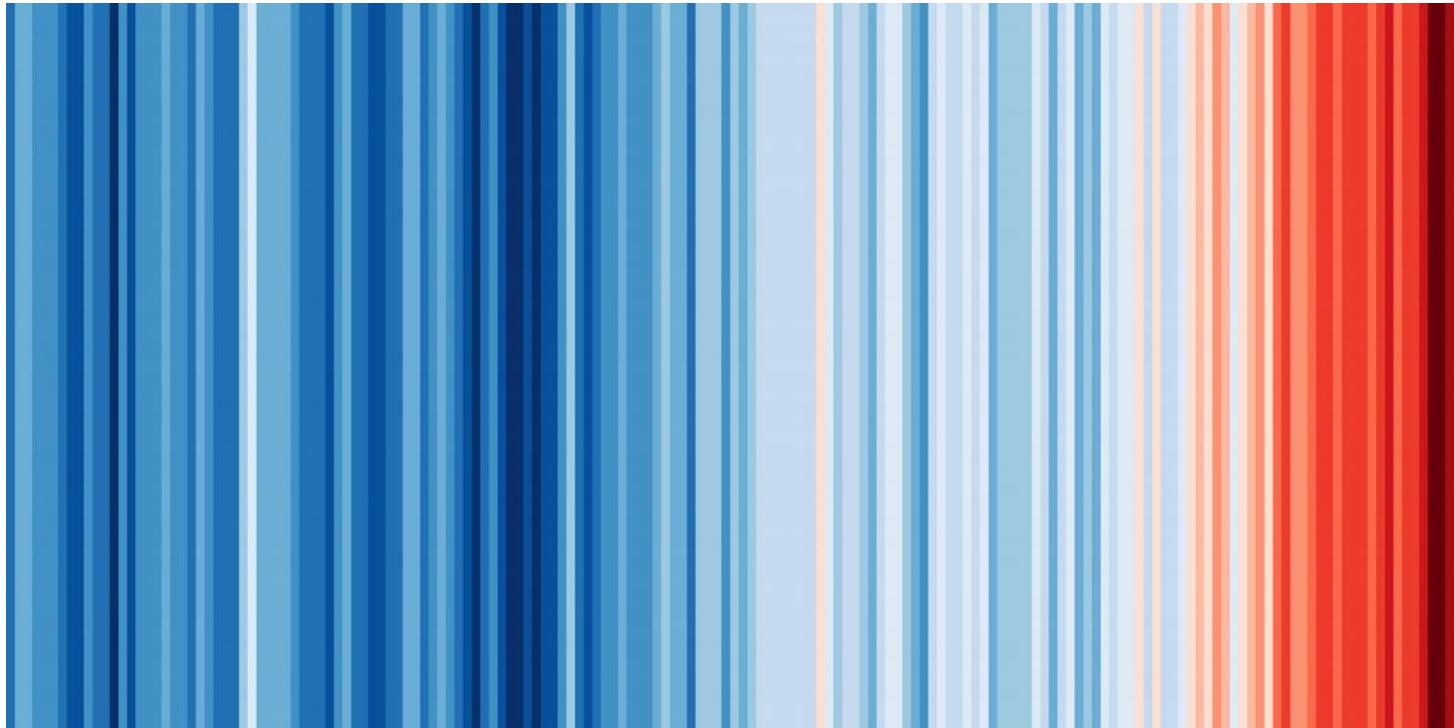
A CHANGING WORLD

A CHANGING WORLD

Global change is a major change on a geological timescale



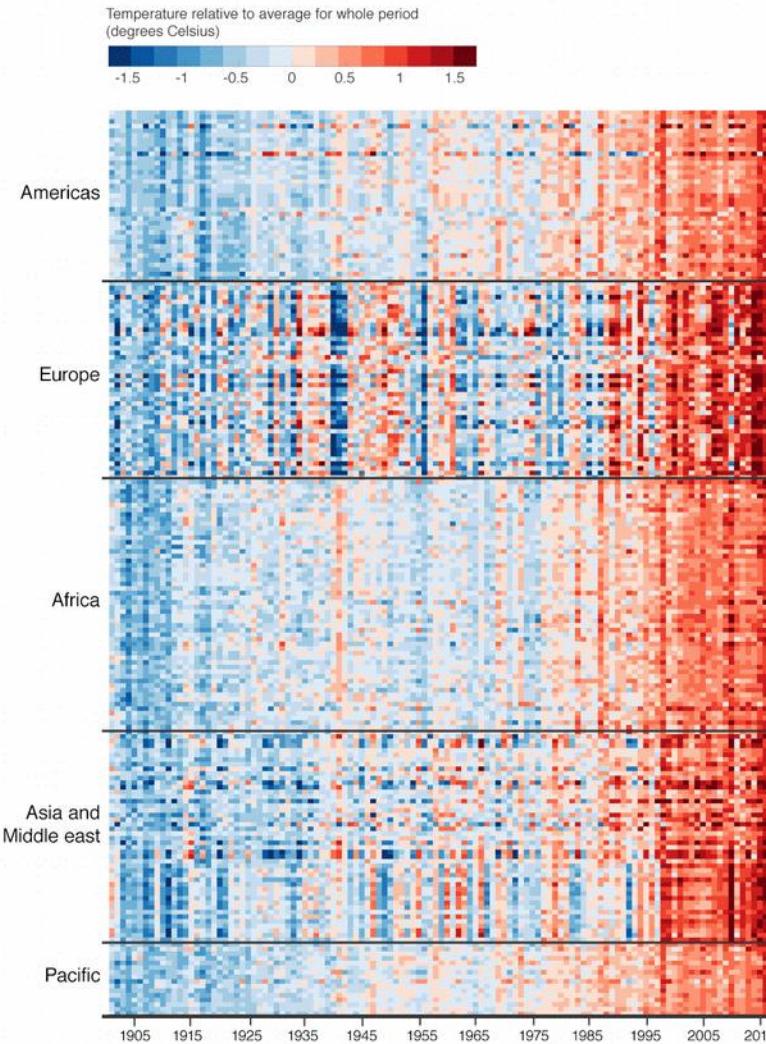
WARMER



UF

WARMER

Temperature changes around the world (1901-2018)



Source: Ed Hawkins/Reading University

BBC



WARMER

Temperature changes around the world (1901-2018)

Florida

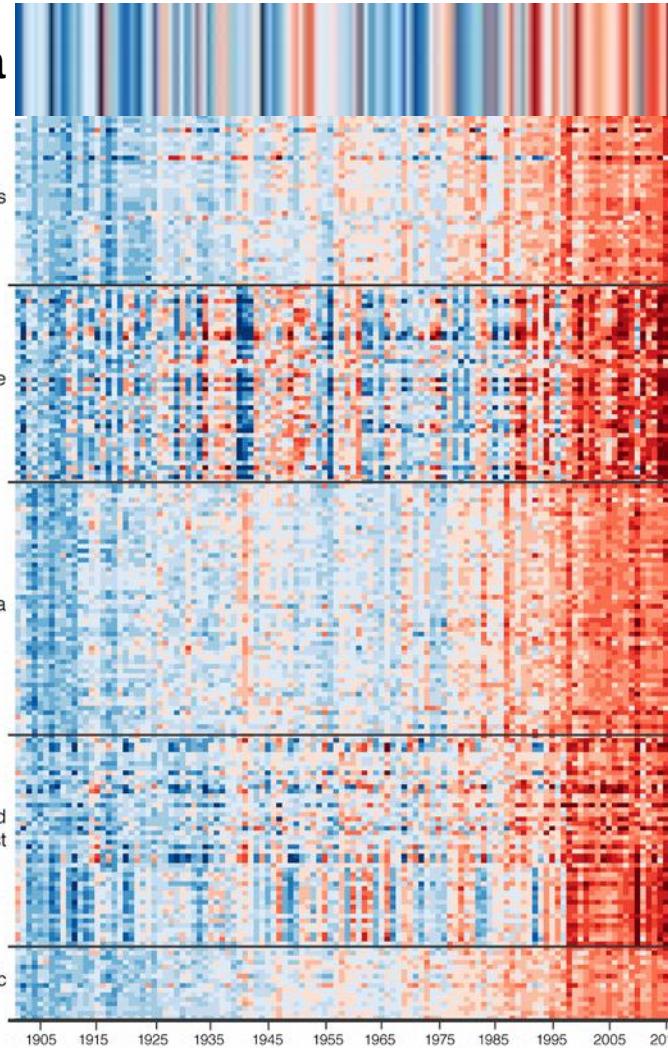
Americas

Europe

Africa

Asia and
Middle east

Pacific



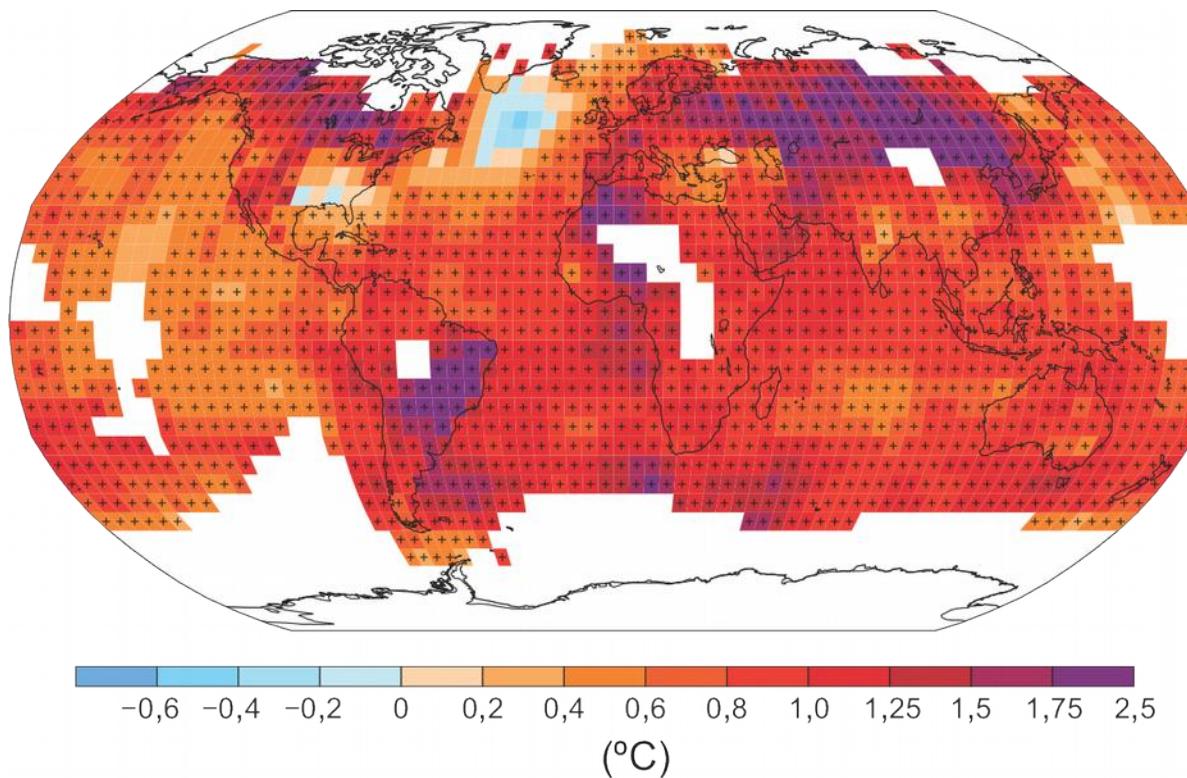
Source: Ed Hawkins/Reading University

BBC

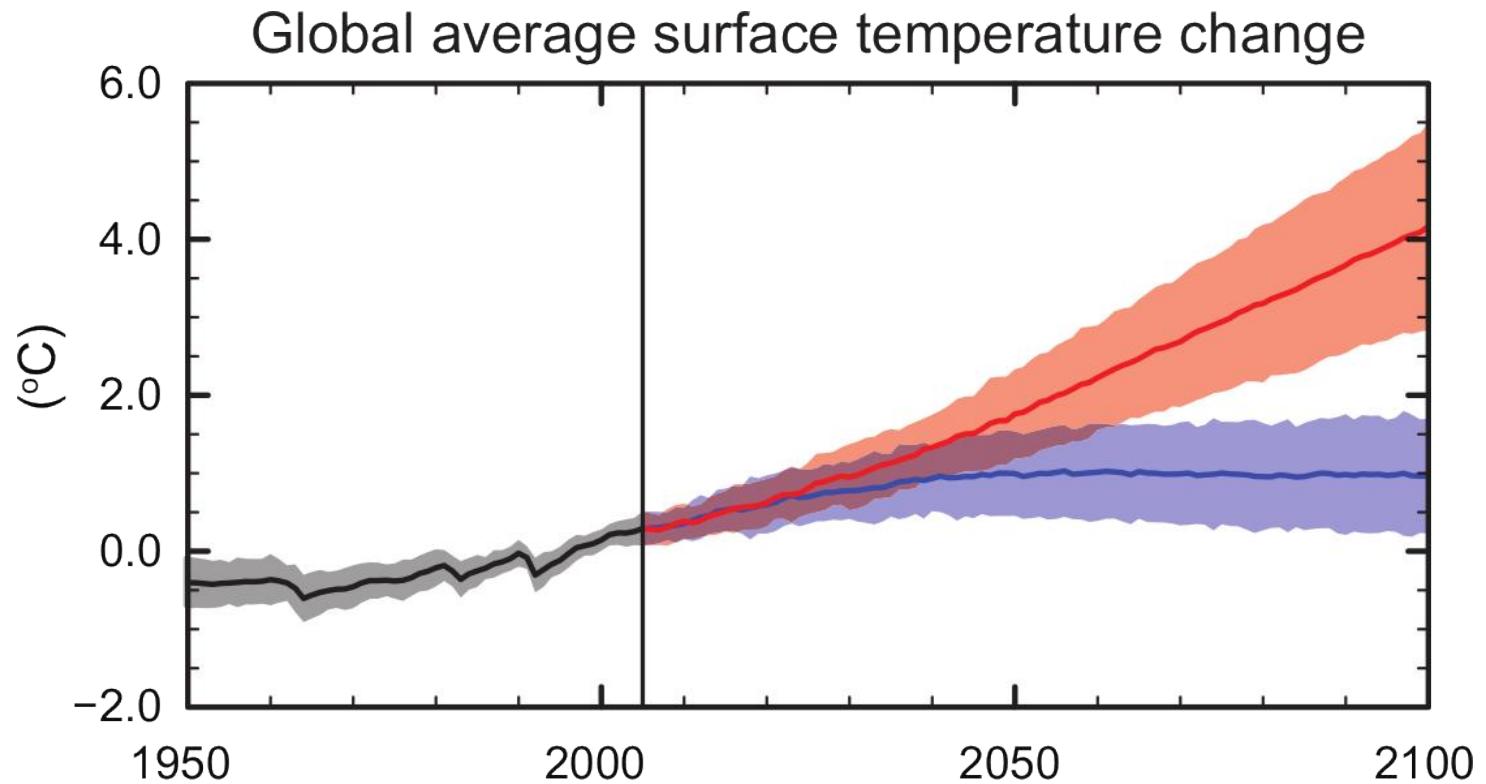


WARMER

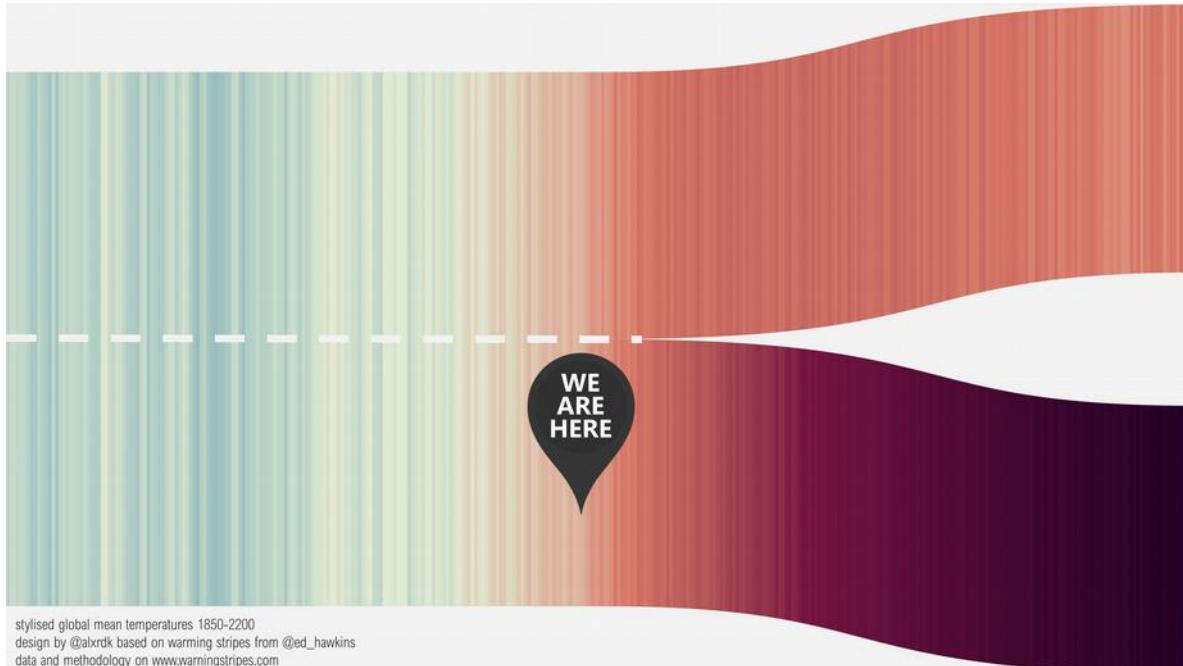
Observed change in surface temperature 1901-2012



WARMER



WARMER



Best-case scenario

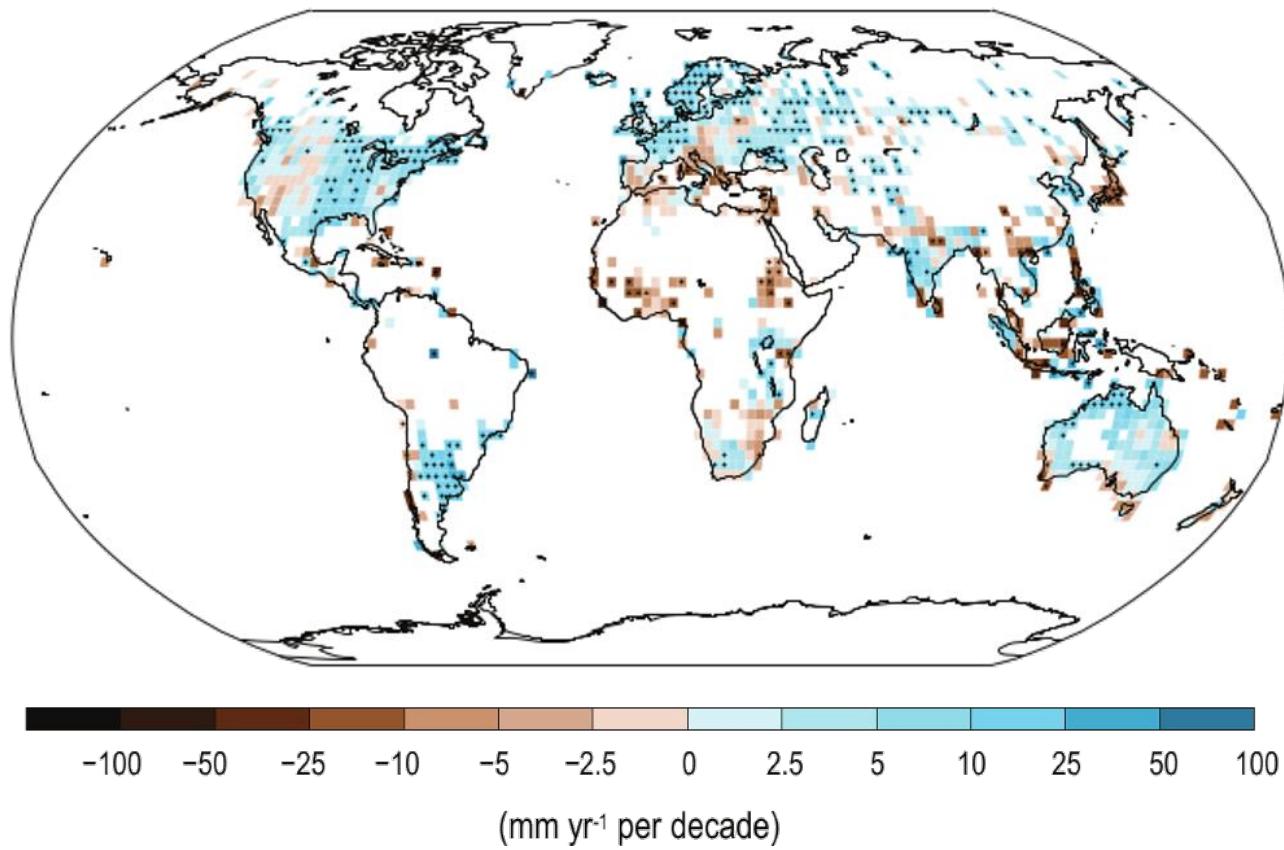
Worst-case scenario

→ Climate switchboard

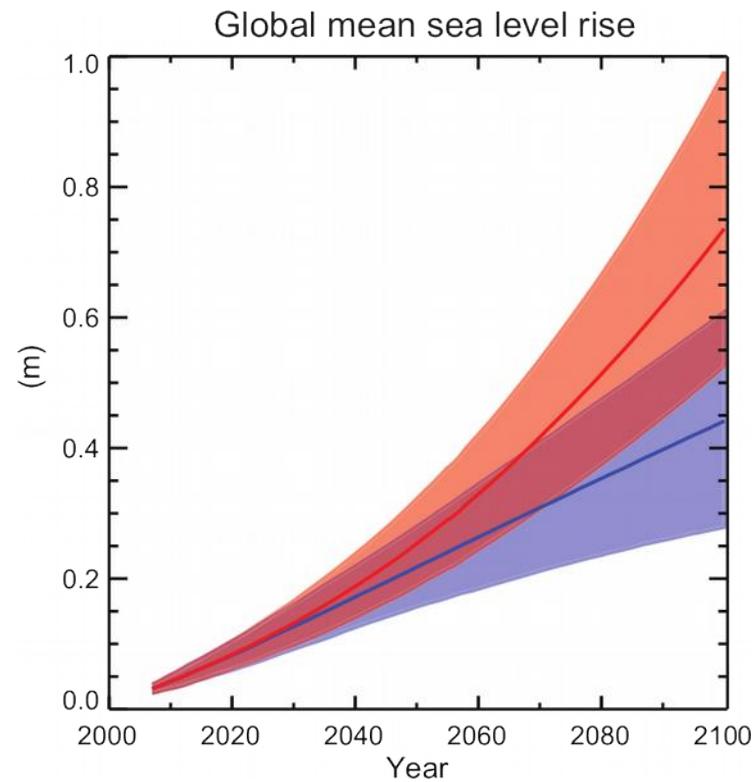
UF

WETTER

Observed change in annual precipitation over land
1901– 2010



WETTER





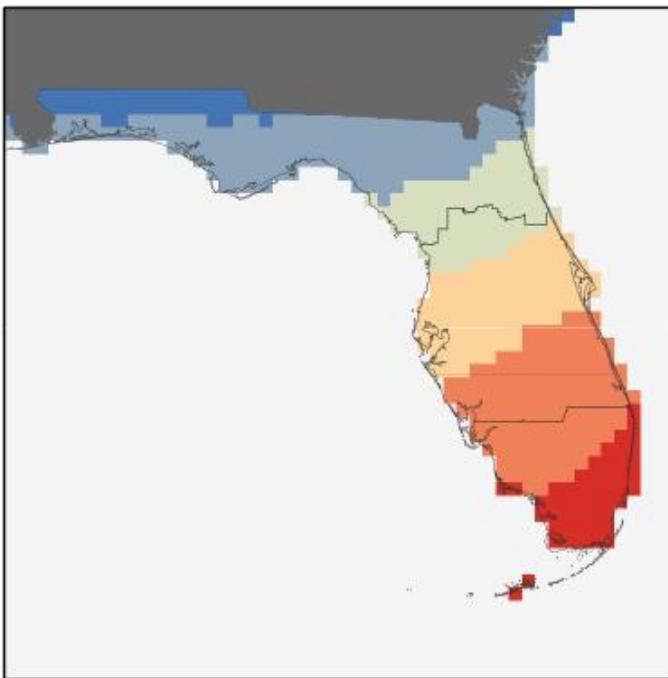
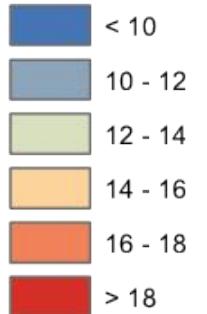
FLORIDA IN A CHANGING WORLD

WELCOME TO THE TROPICS

Present

2050

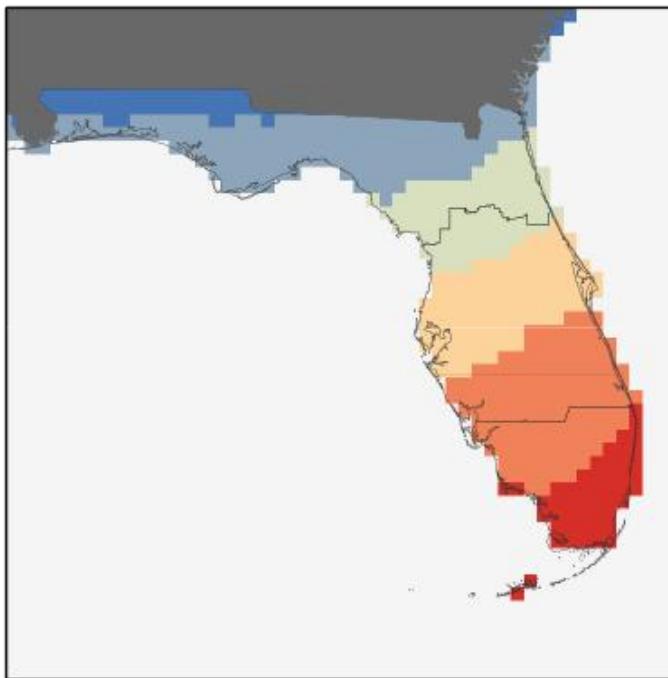
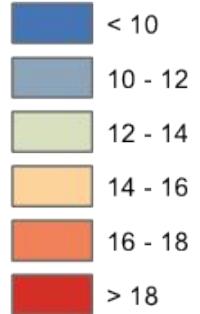
January temperature (C)



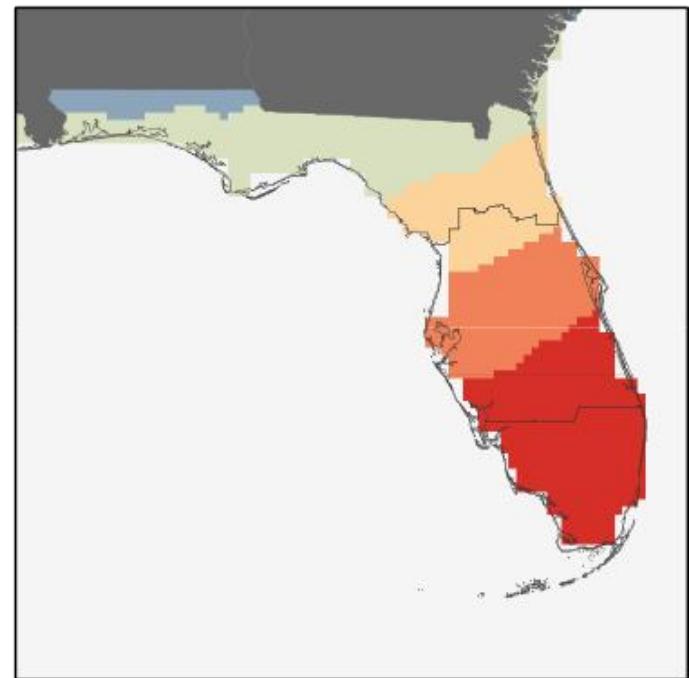
WELCOME TO THE TROPICS

Present

January temperature (C)



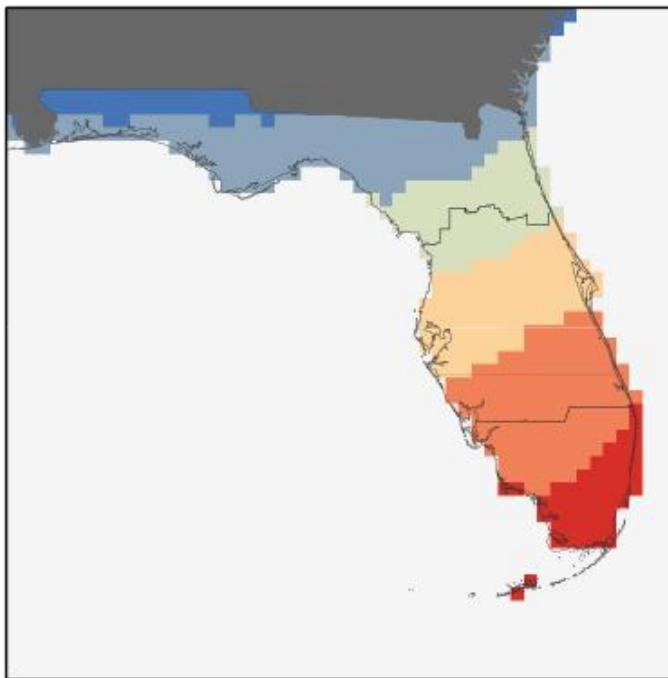
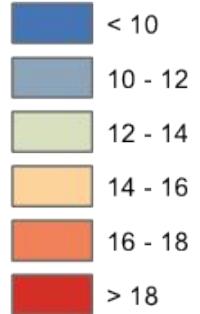
2050



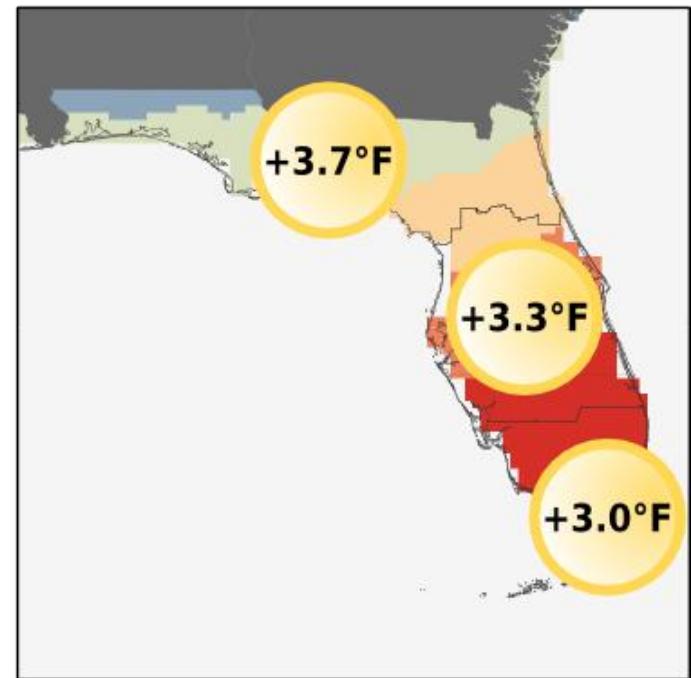
WELCOME TO THE TROPICS

Present

January temperature (C)



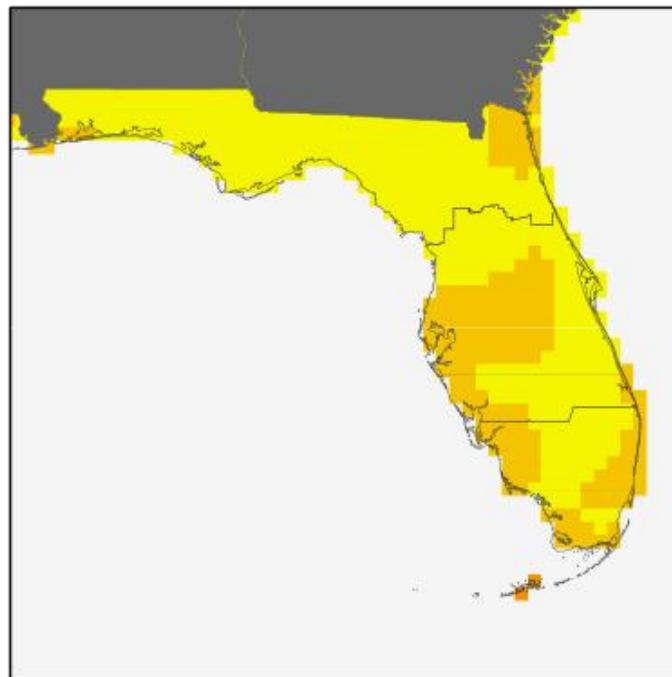
2050



WELCOME TO THE TROPICS

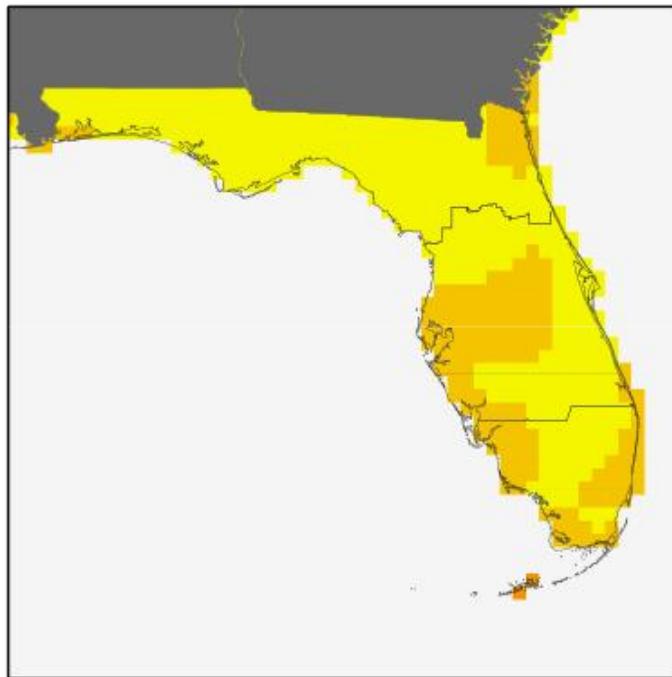
Present

2050

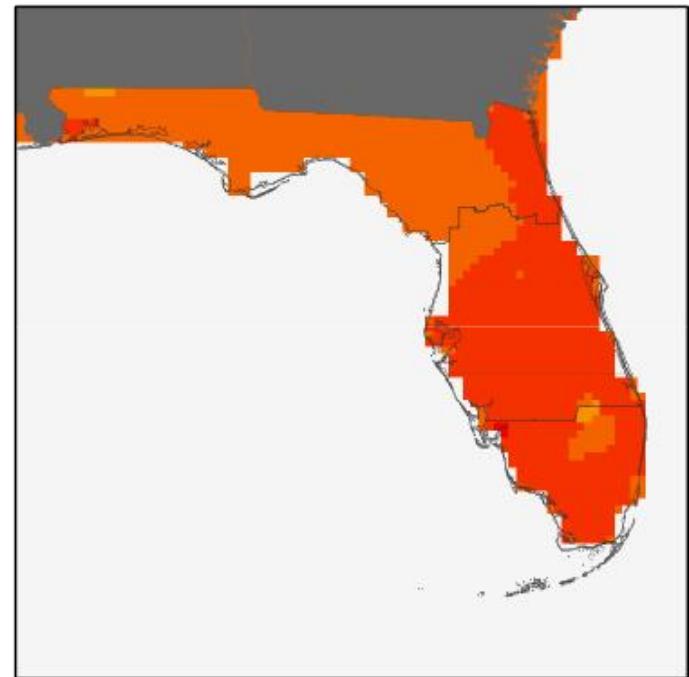


WELCOME TO THE TROPICS

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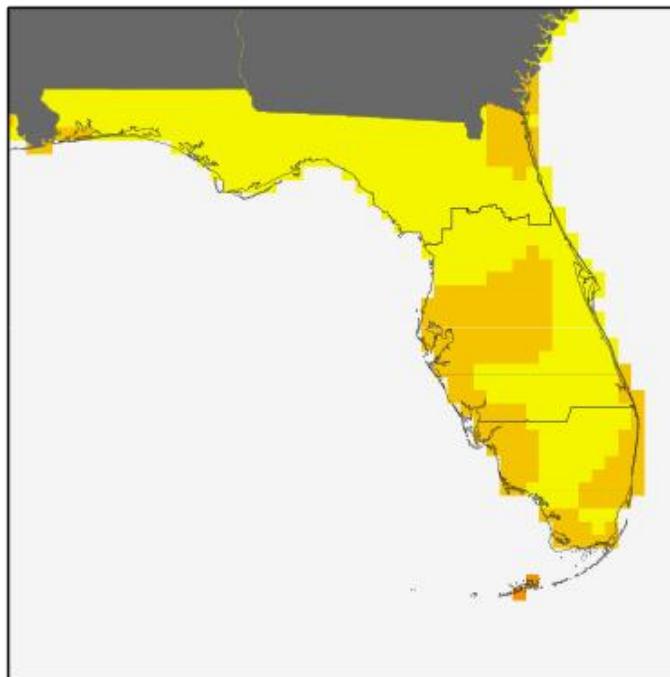


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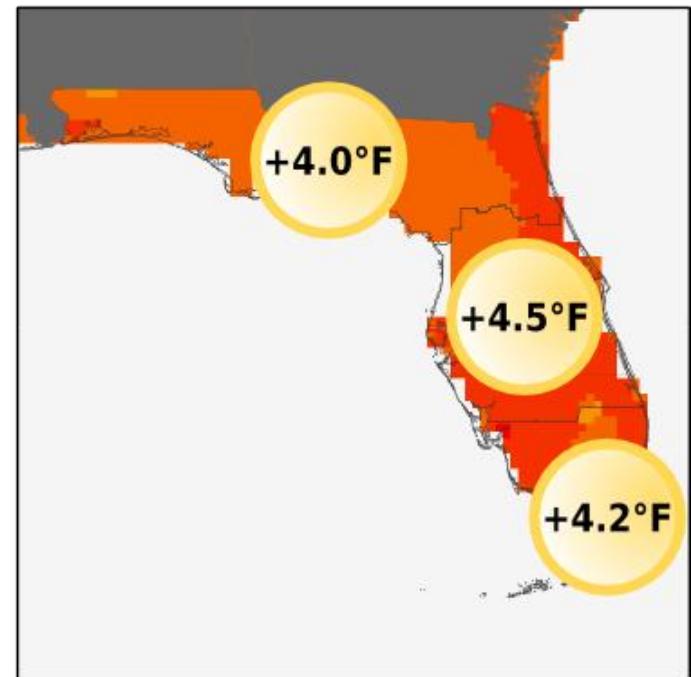


WELCOME TO THE TROPICS

Present



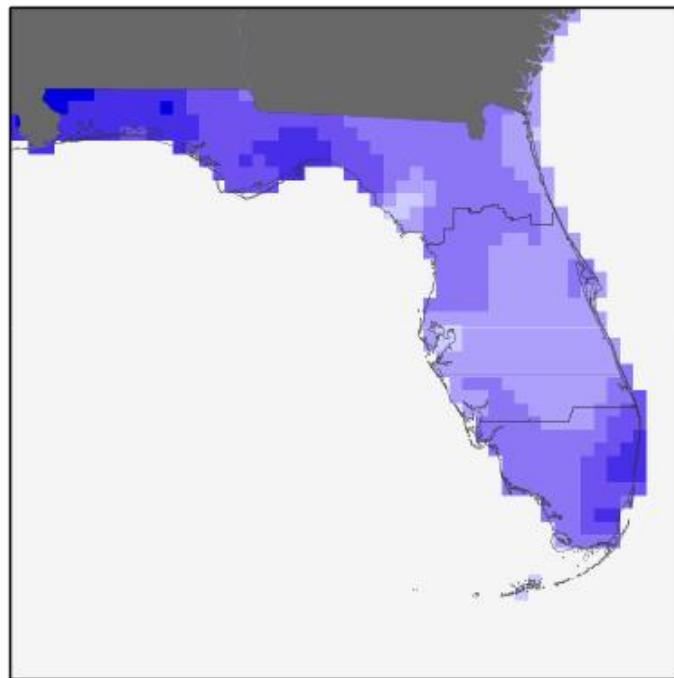
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WELCOME TO THE TROPICS

Present

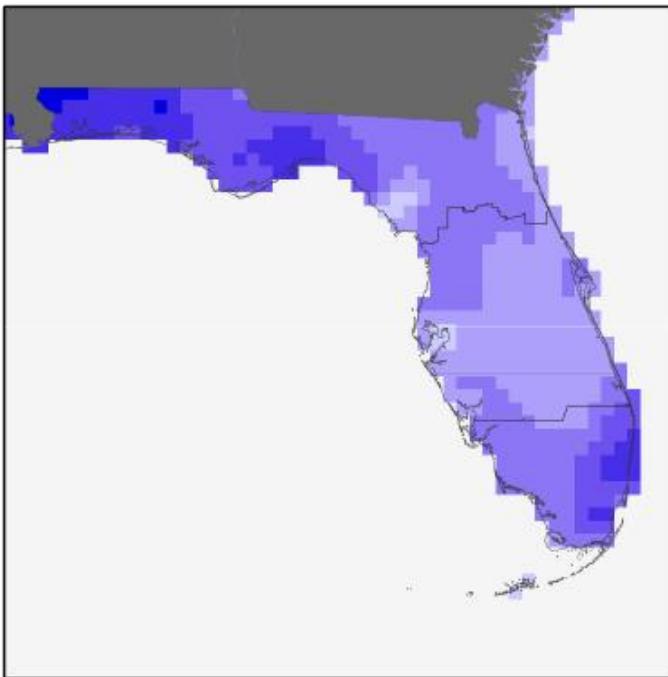
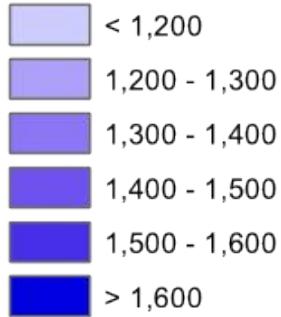
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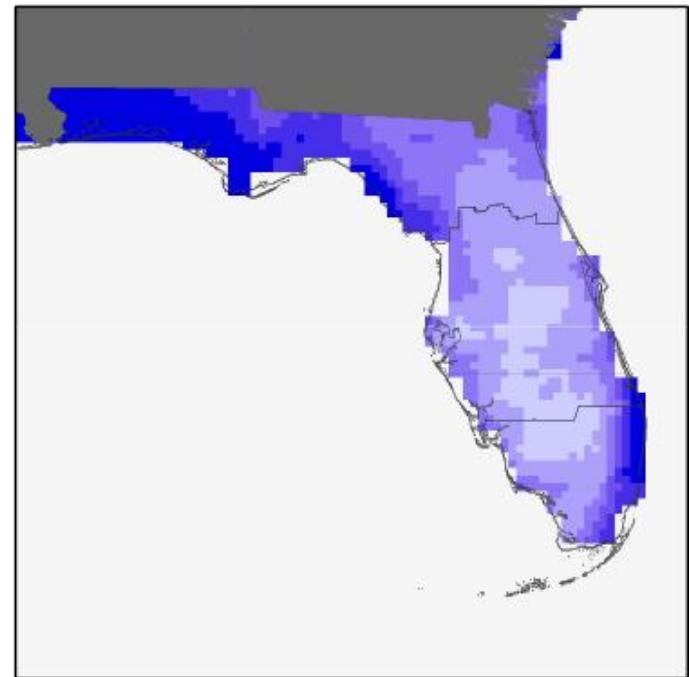
WELCOME TO THE TROPICS

Present

Annual precipitation (mm)



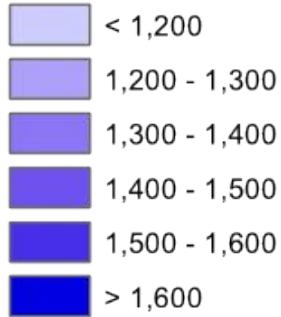
2050



WELCOME TO THE TROPICS

Present

Annual precipitation (mm)



2050

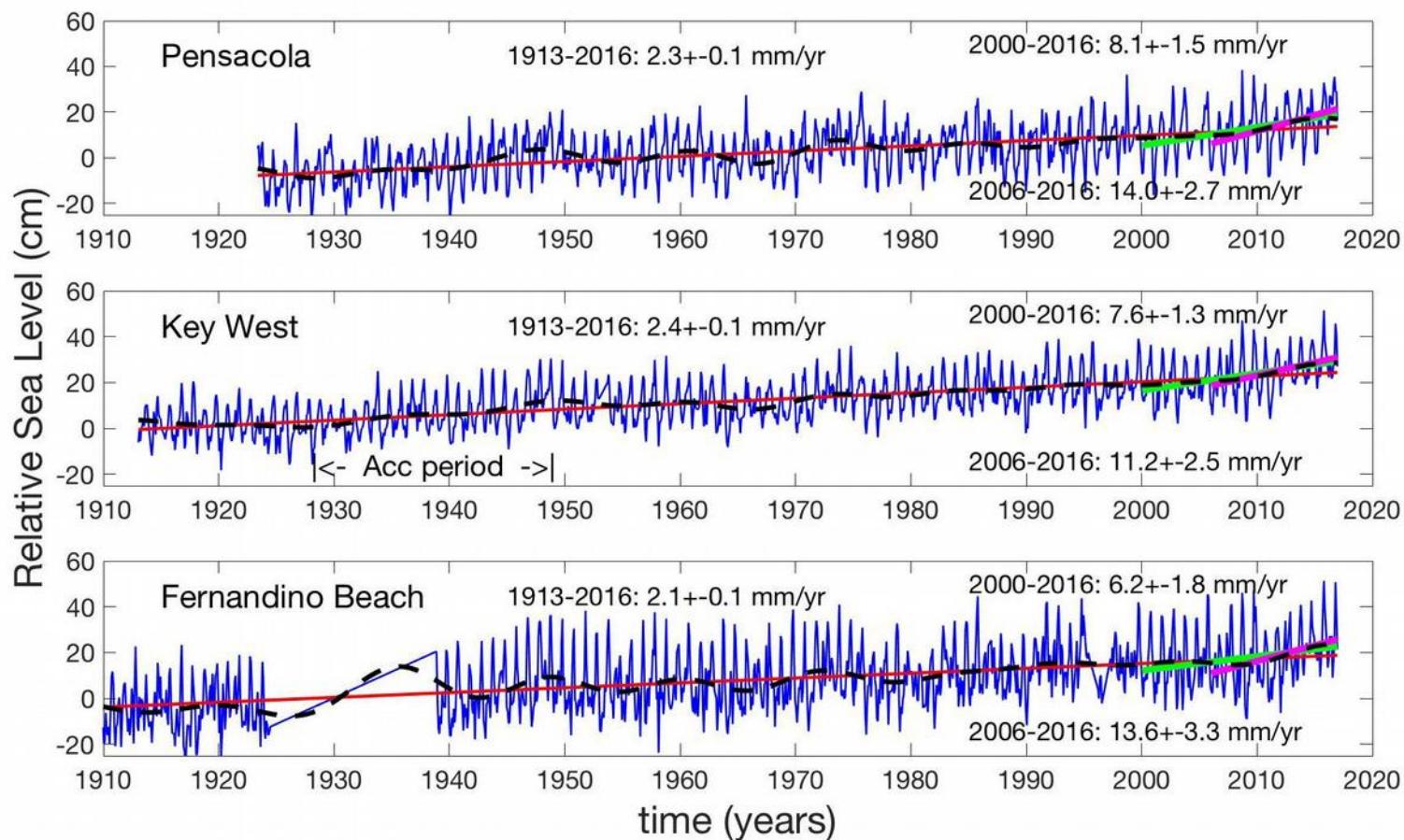
+3.5"

-1.3"

-3.1"

UF

FLORIDA IS DROWNING LITTLE BY LITTLE...



FLORIDA IS DROWNING LITTLE BY LITTLE...



▼ 1 Meter SLR

1

▼ 2 Meter SLR

2

▼ 3 Meter SLR

3

▼ 4 Meter SLR

4

▼ 5 Meter SLR

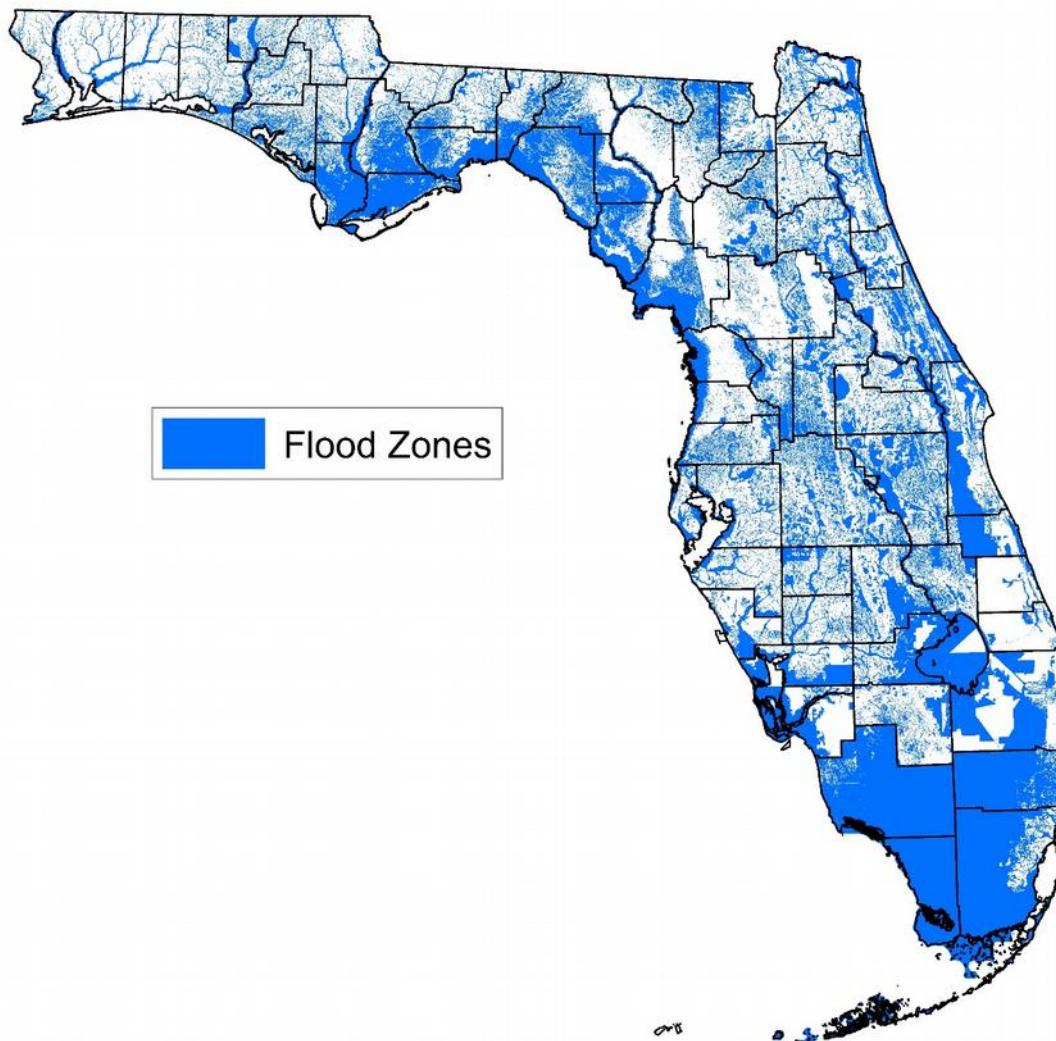
5

▼ 6 Meter SLR

6

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)



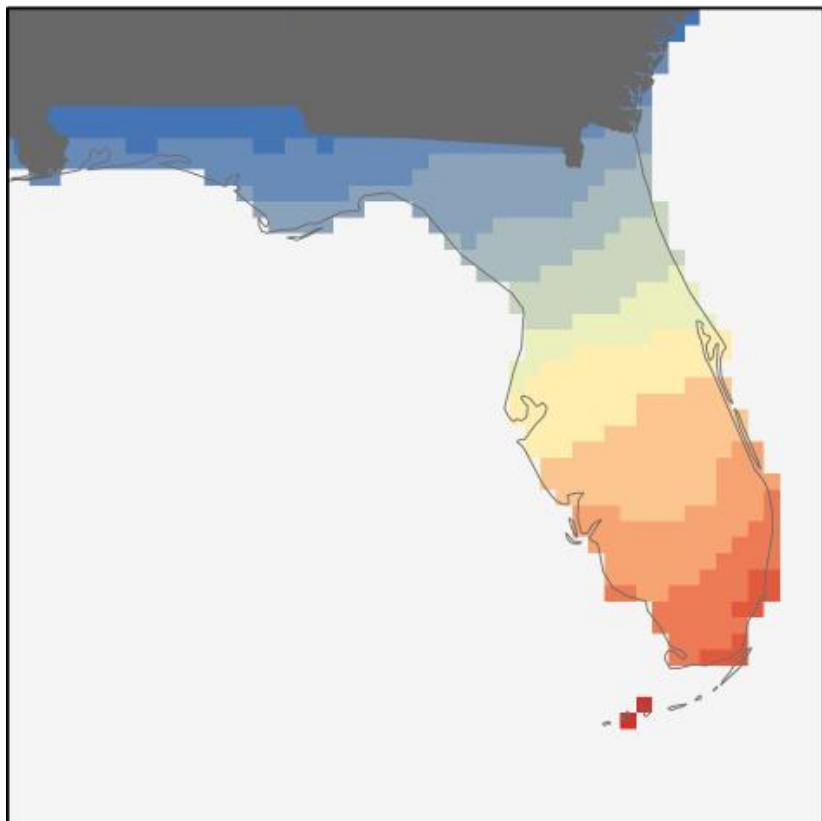


THREATENED AND ENDANGERED SPECIES IN THE EVERGLADES



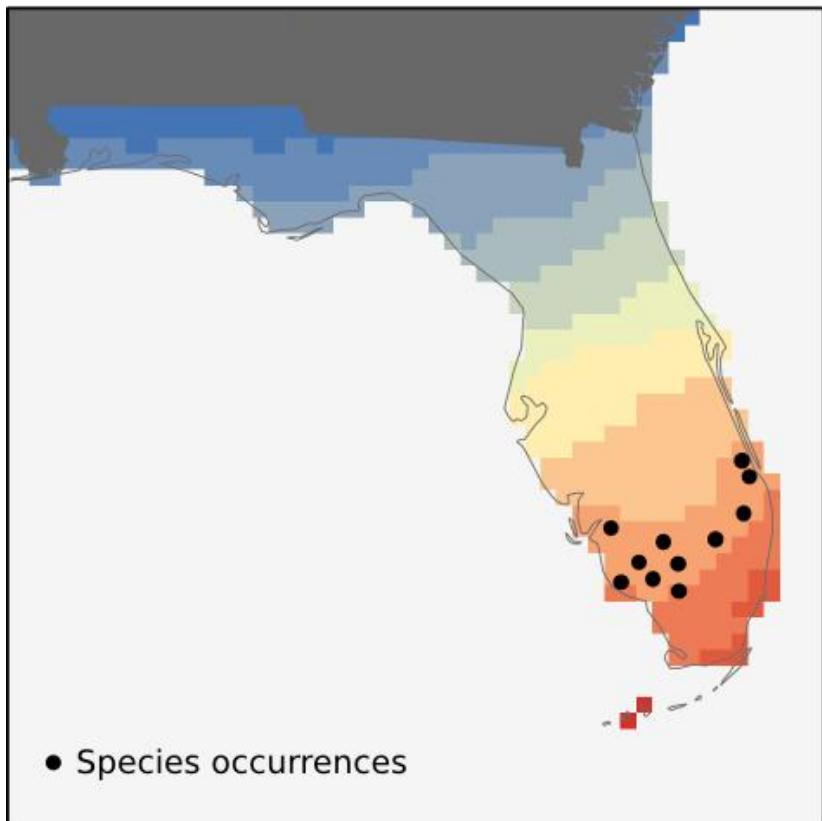
SPECIES DISTRIBUTION MODELS

Present



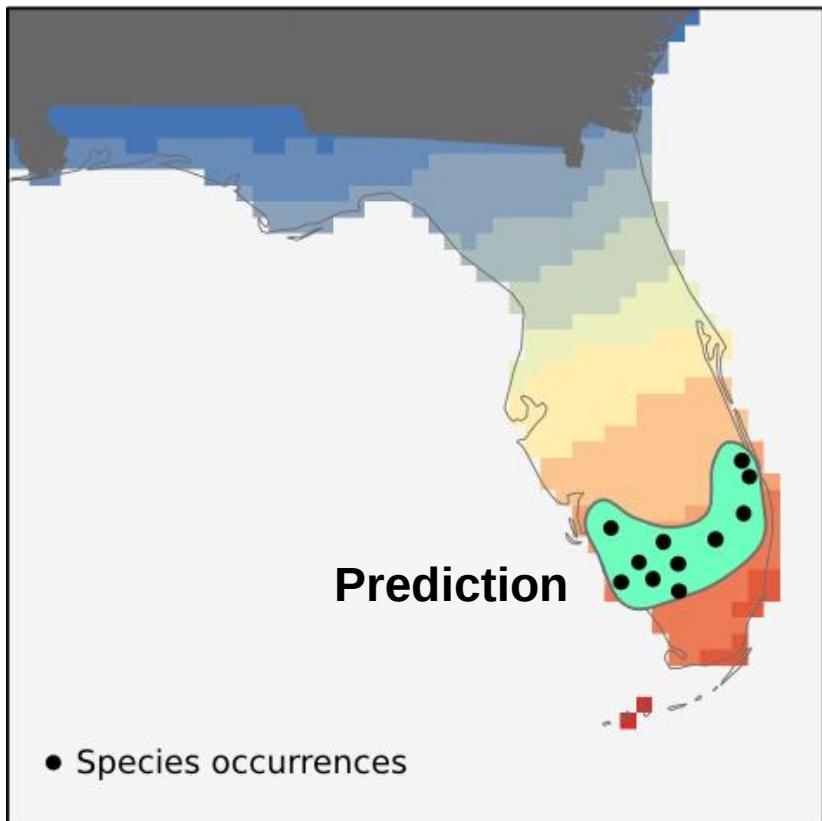
SPECIES DISTRIBUTION MODELS

Present



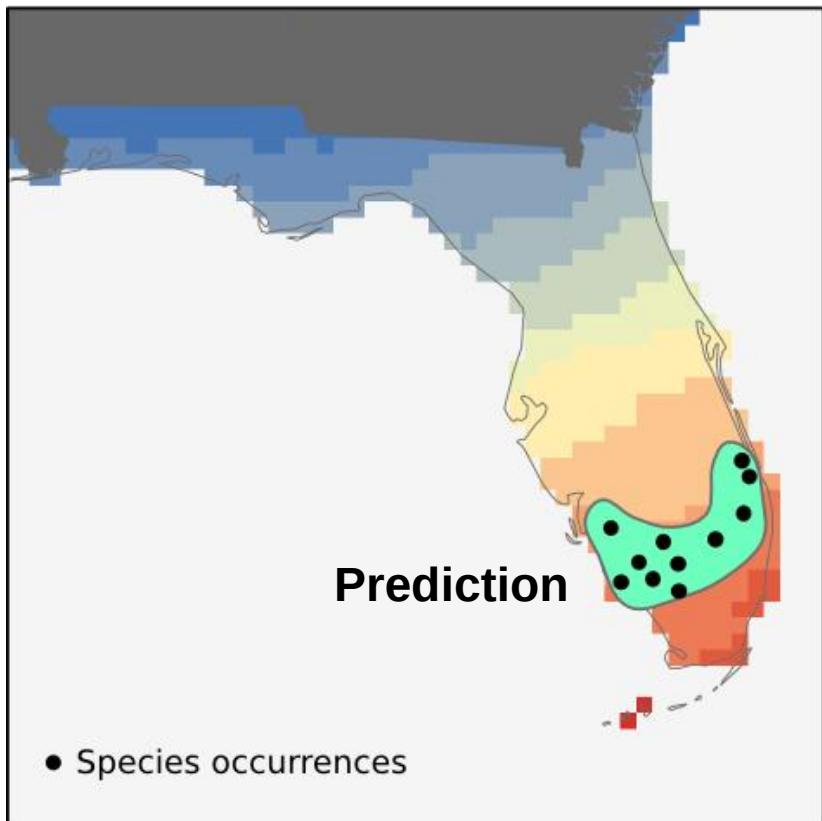
SPECIES DISTRIBUTION MODELS

Present

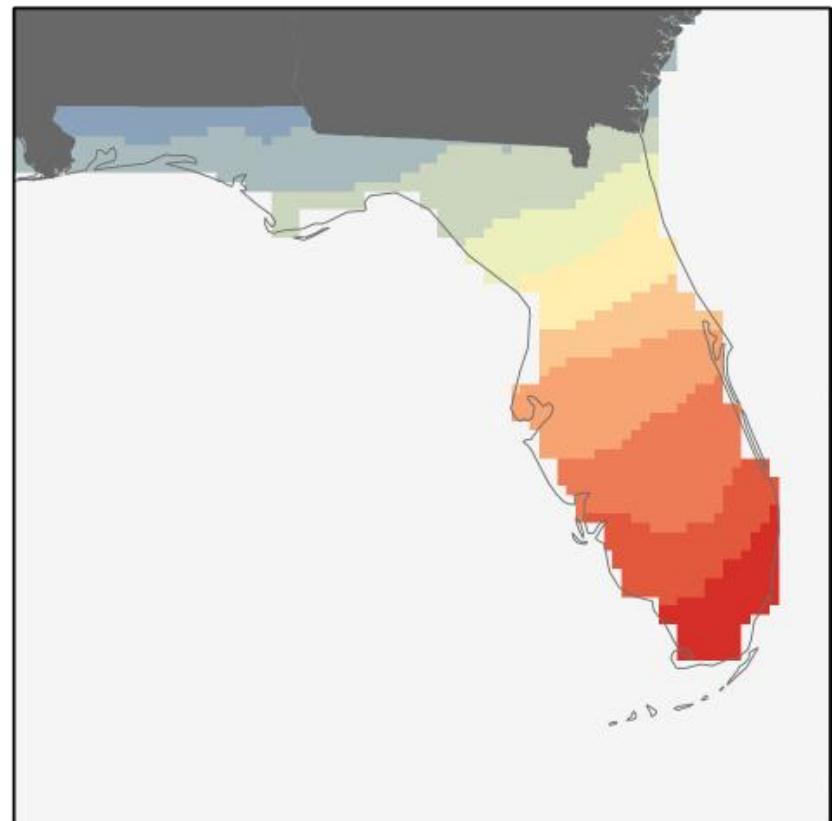


SPECIES DISTRIBUTION MODELS

Present

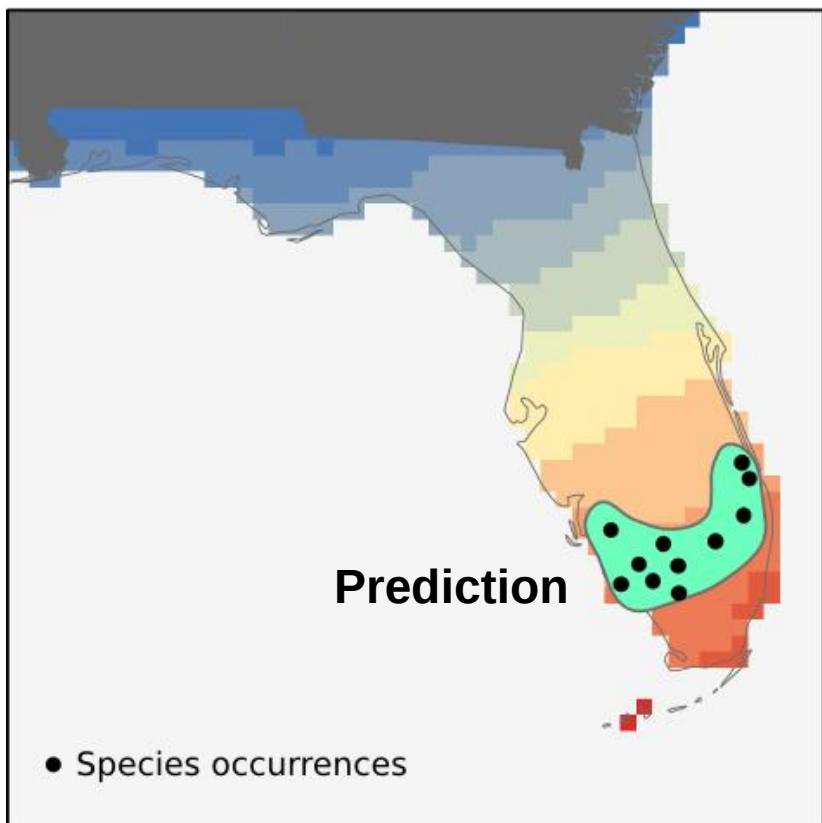


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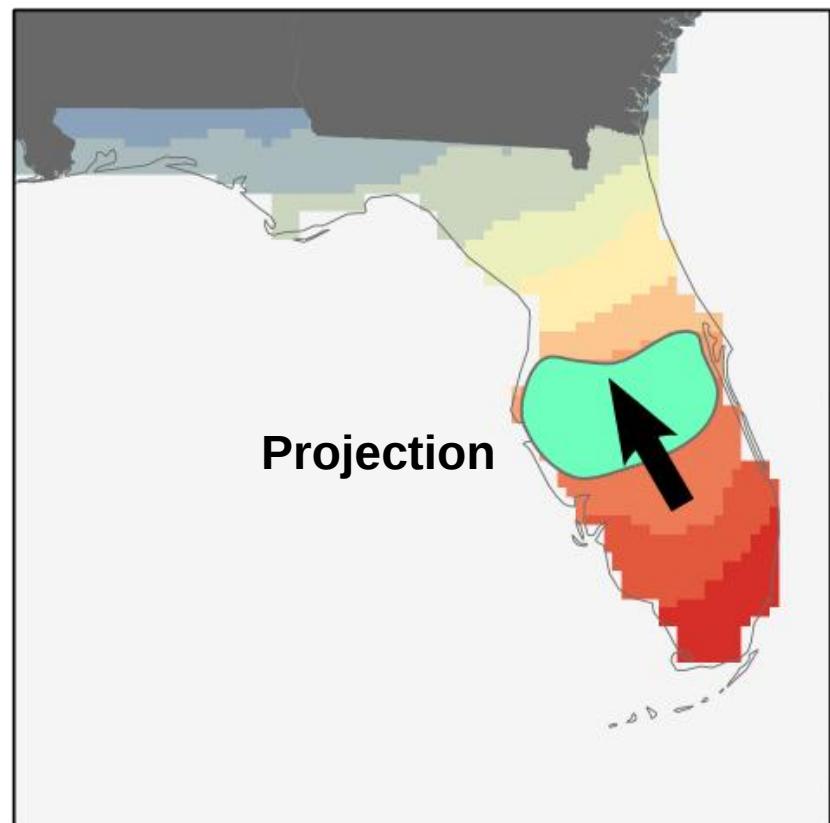


SPECIES DISTRIBUTION MODELS

Present



2050



WILDLIFE IN SOUTH FLORIDA

American
crocodile



UF

WILDLIFE IN SOUTH FLORIDA



Current range



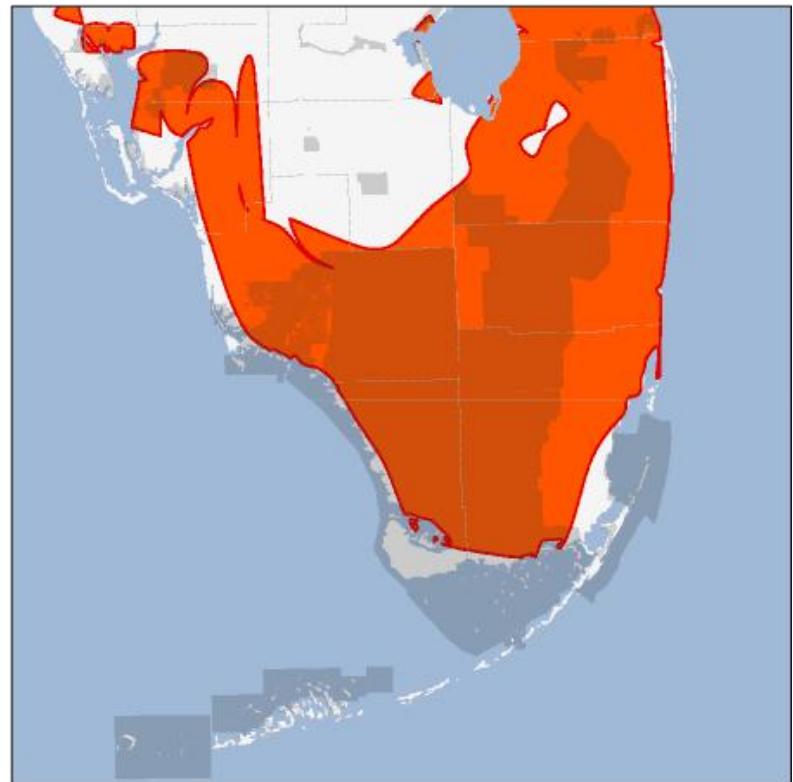
WILDLIFE IN SOUTH FLORIDA



Current range



2060



WILDLIFE IN SOUTH FLORIDA

Florida panther

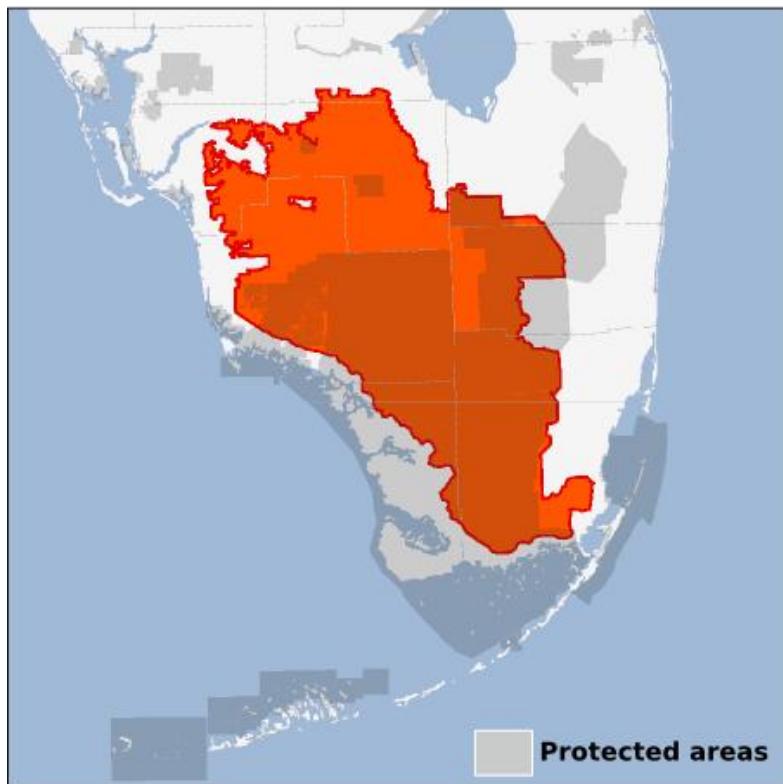


UF



WILDLIFE IN SOUTH FLORIDA

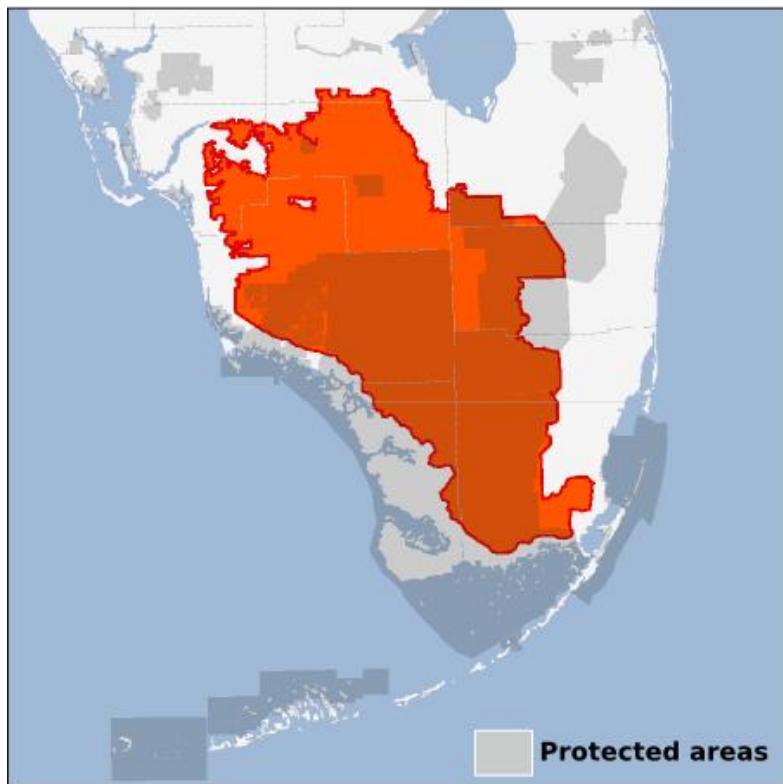
Current range



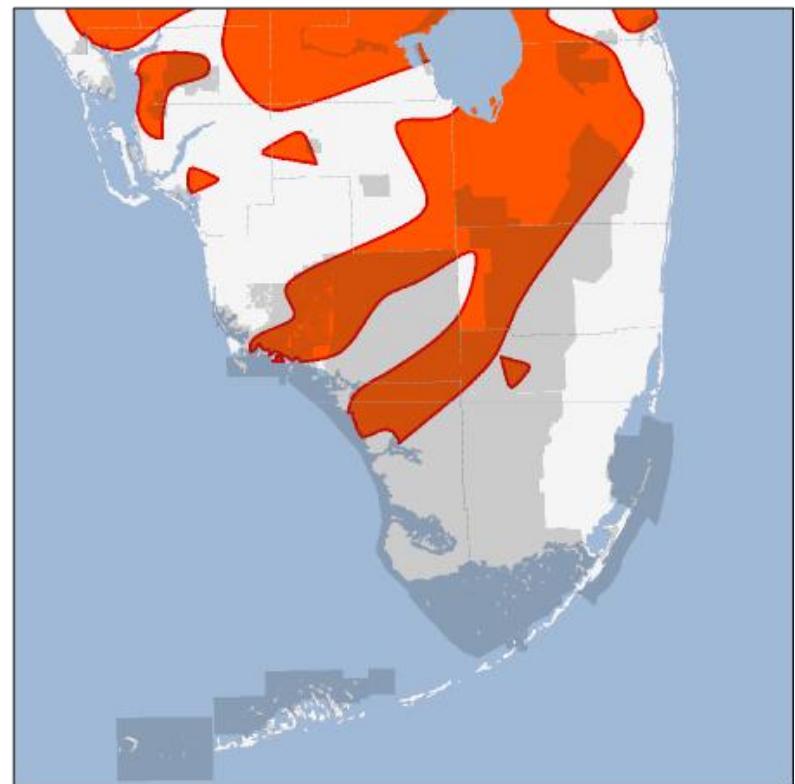


WILDLIFE IN SOUTH FLORIDA

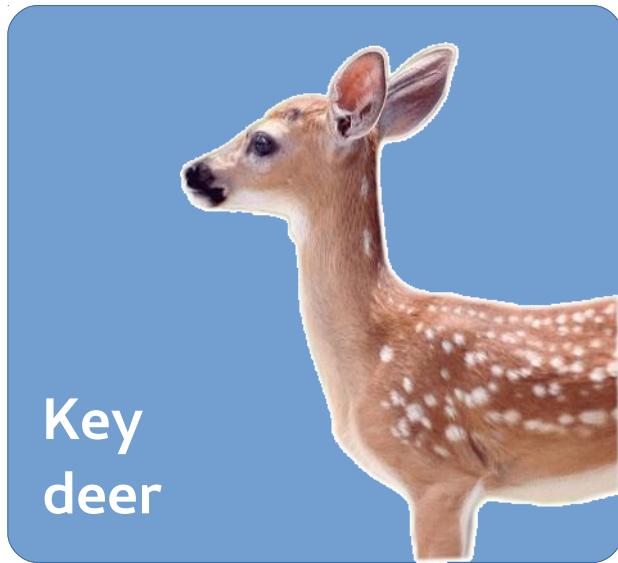
Current range



2060



WILDLIFE IN SOUTH FLORIDA

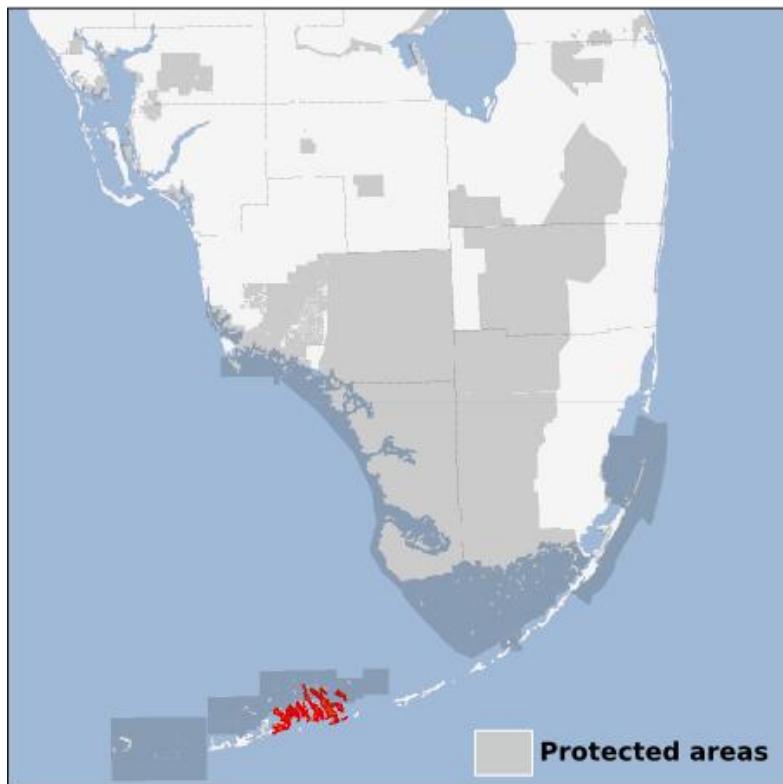


UF

WILDLIFE IN SOUTH FLORIDA



Current range

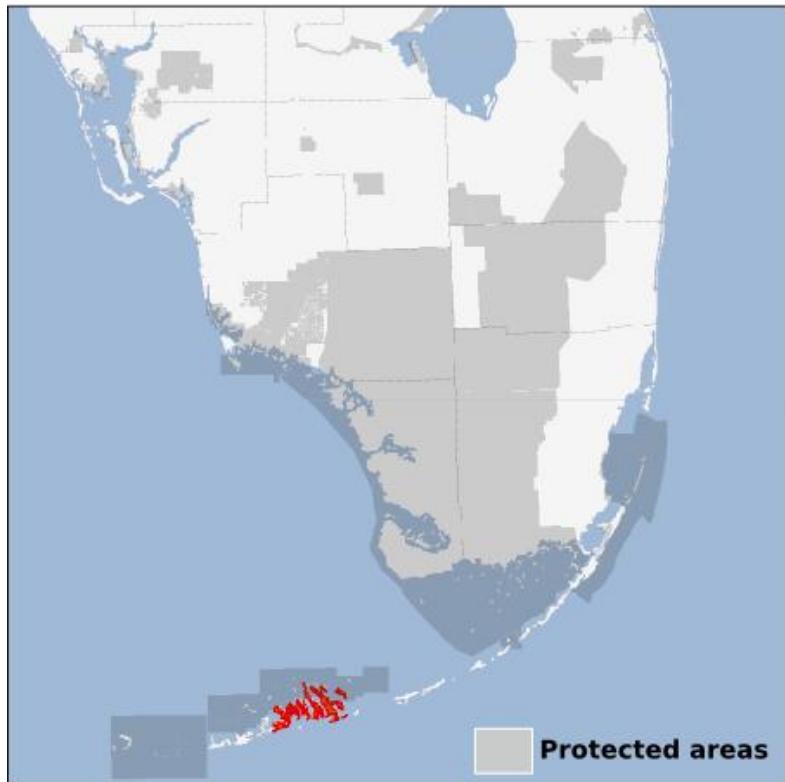


UF

WILDLIFE IN SOUTH FLORIDA



Current range



2060



WILDLIFE IN SOUTH FLORIDA

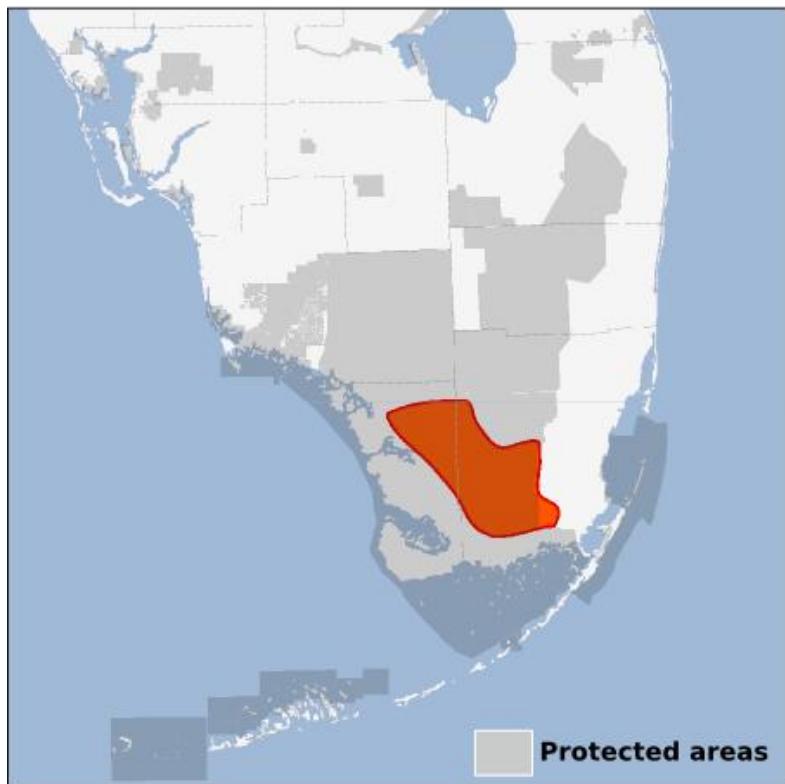
Cape Sable
seaside sparrow





WILDLIFE IN SOUTH FLORIDA

Current range

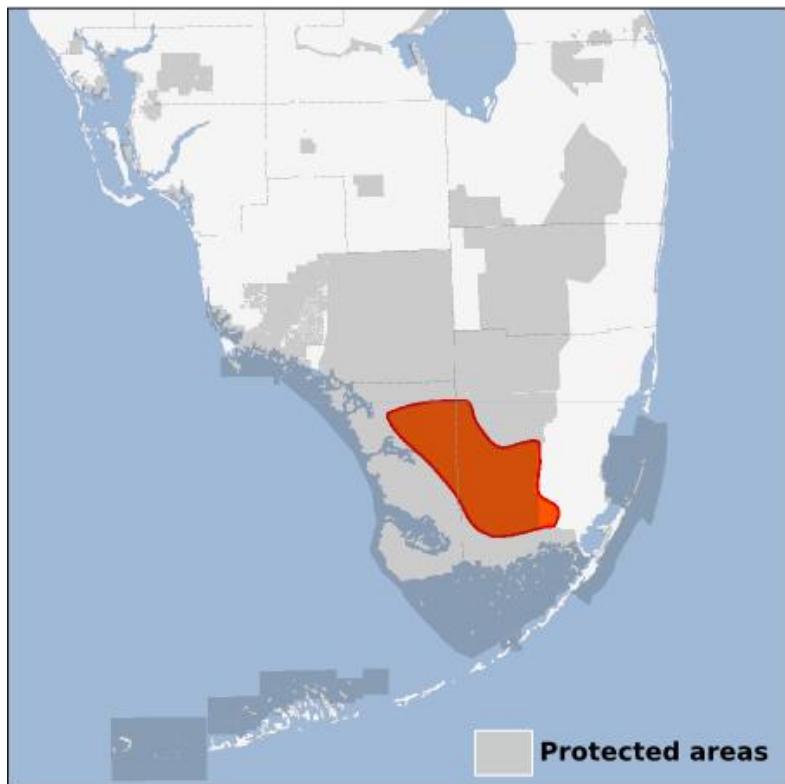


UF

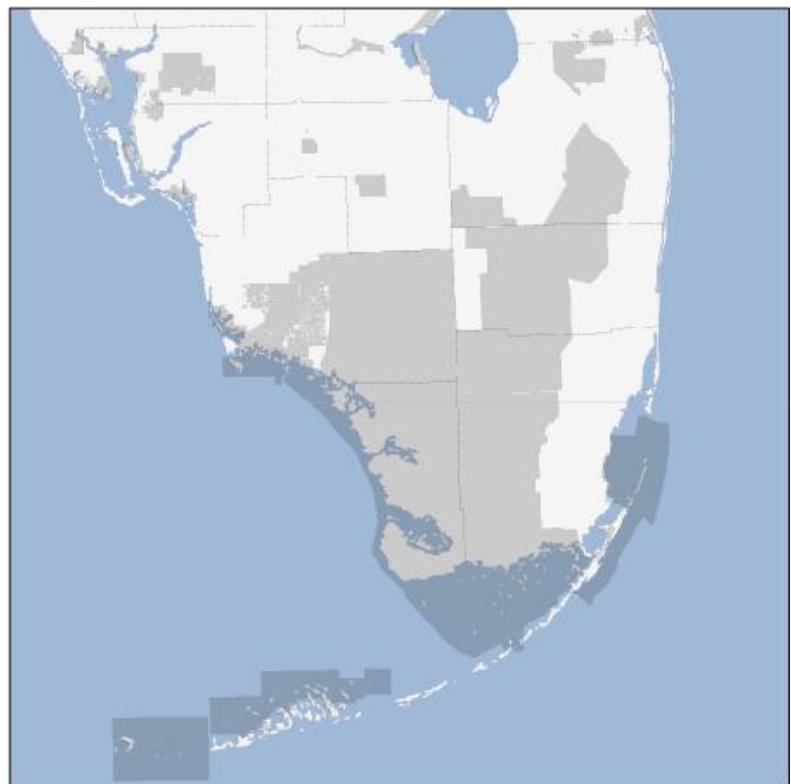


WILDLIFE IN SOUTH FLORIDA

Current range



2060

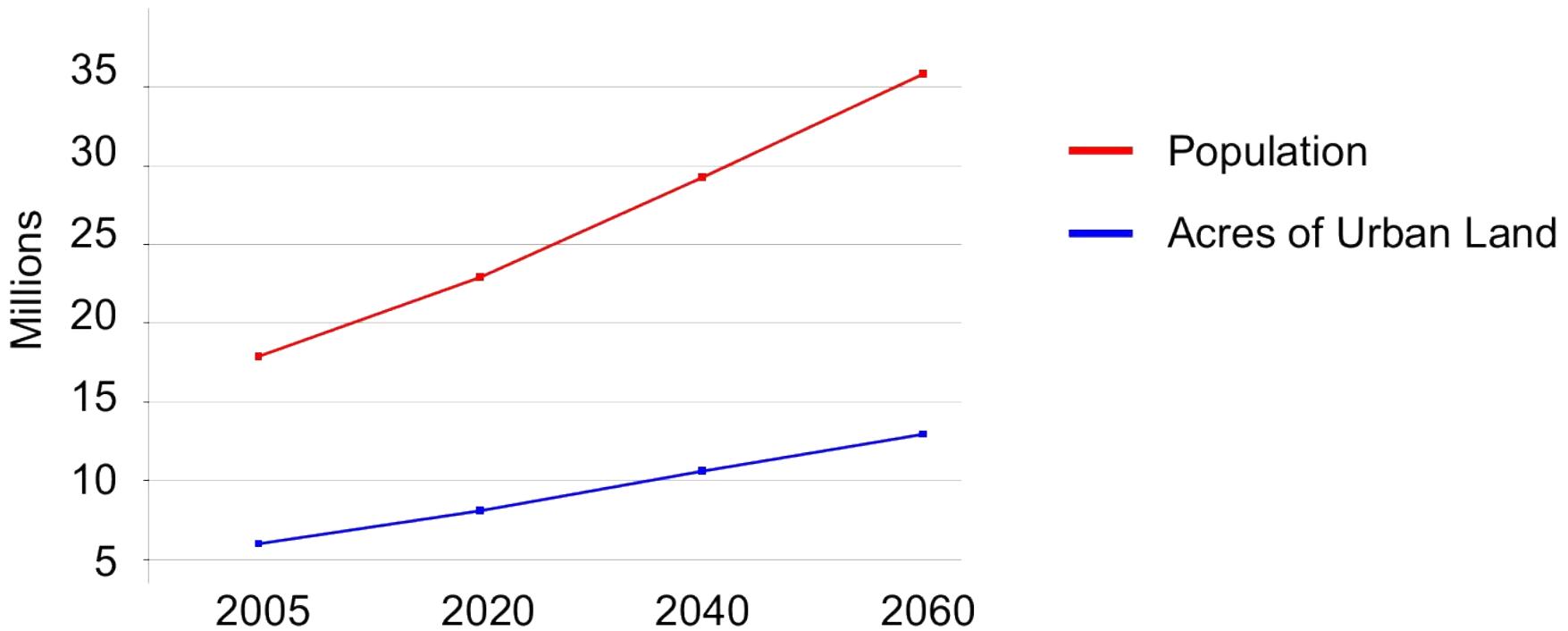




CLIMATE ONLY?

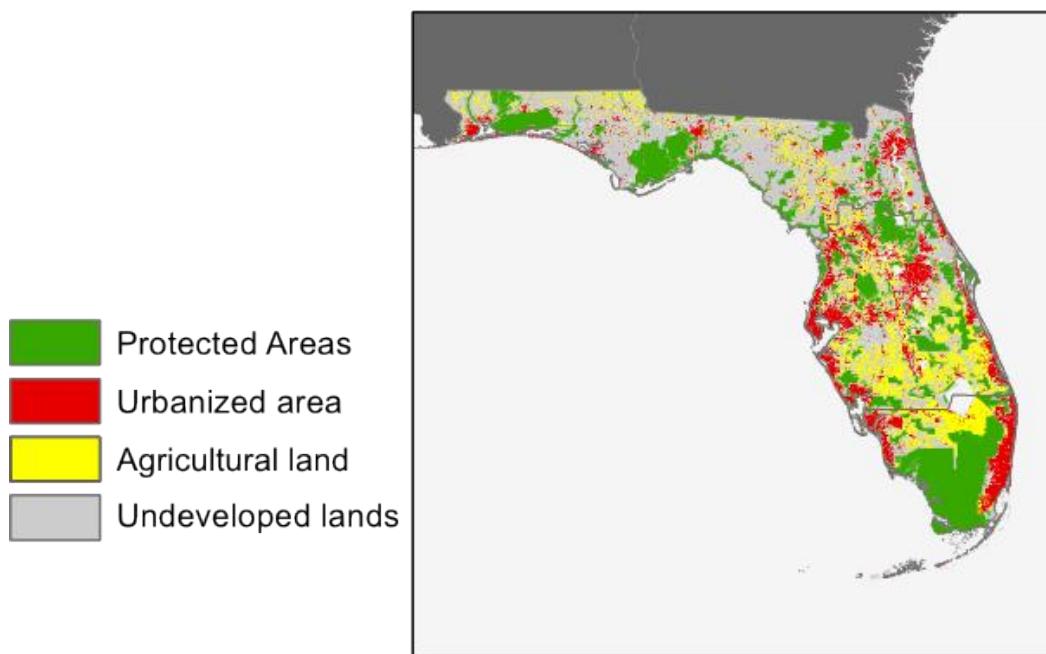


FLORIDA POPULATION IS GROWING FAST



SO IS URBANIZATION...

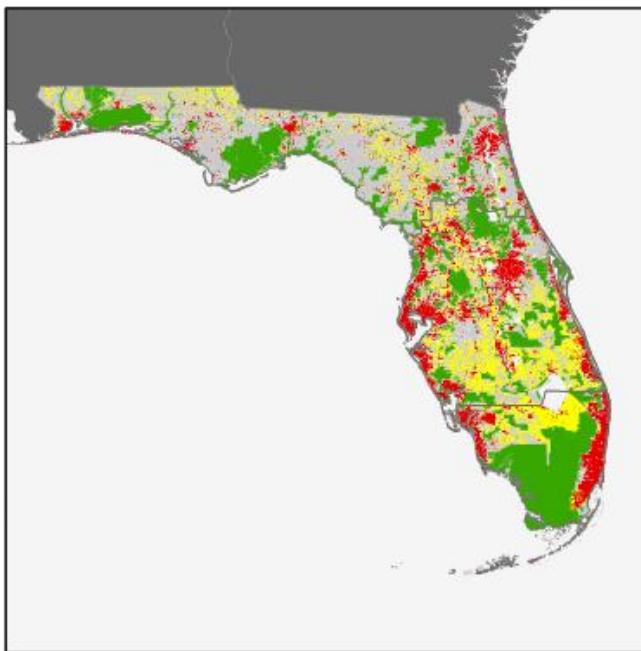
Present



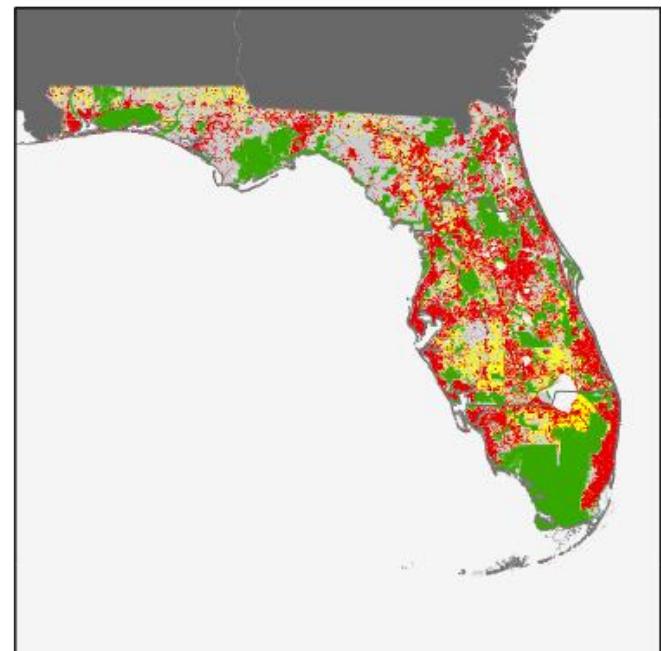
SO IS URBANIZATION...

Present

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



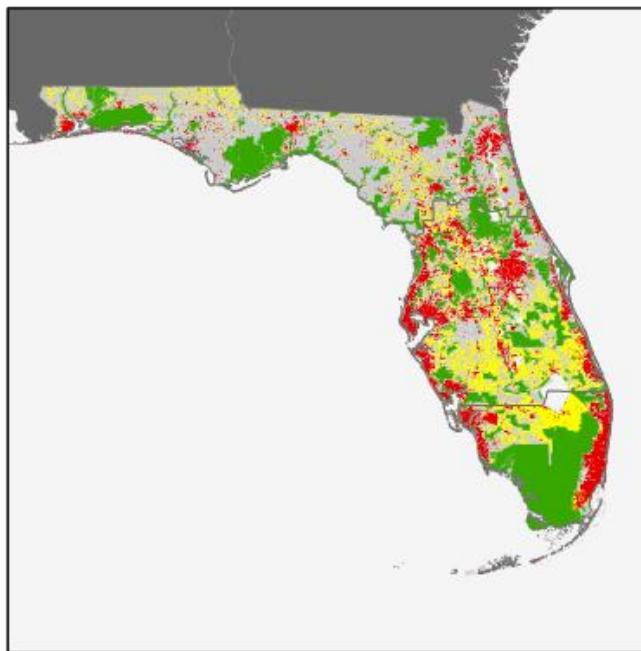
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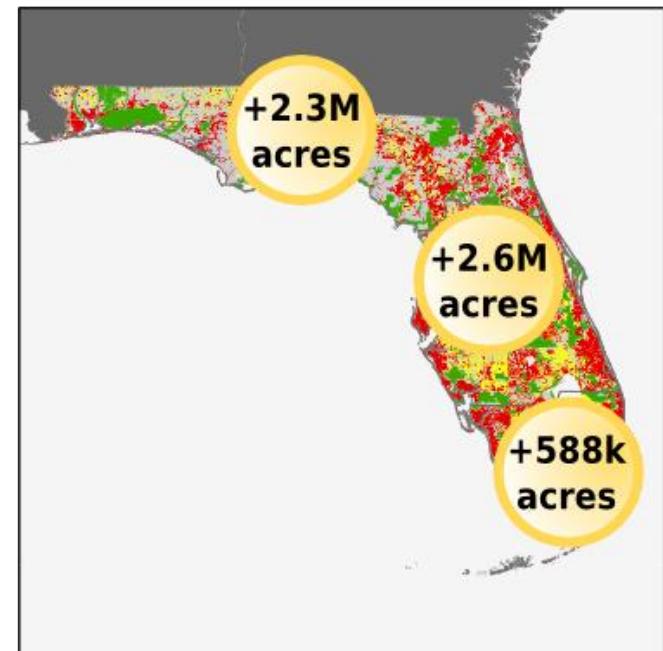
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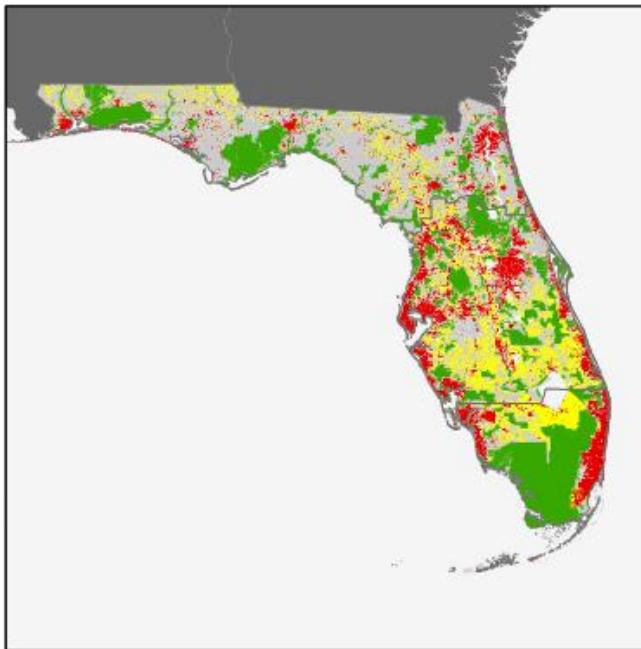
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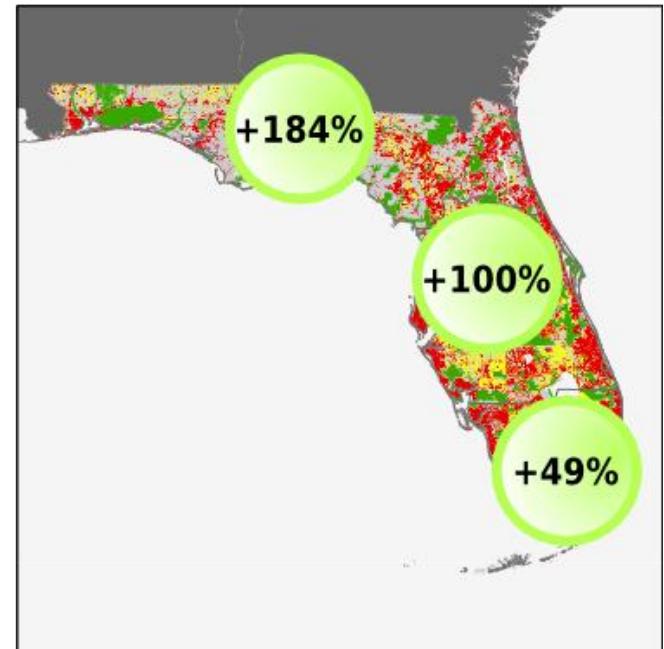
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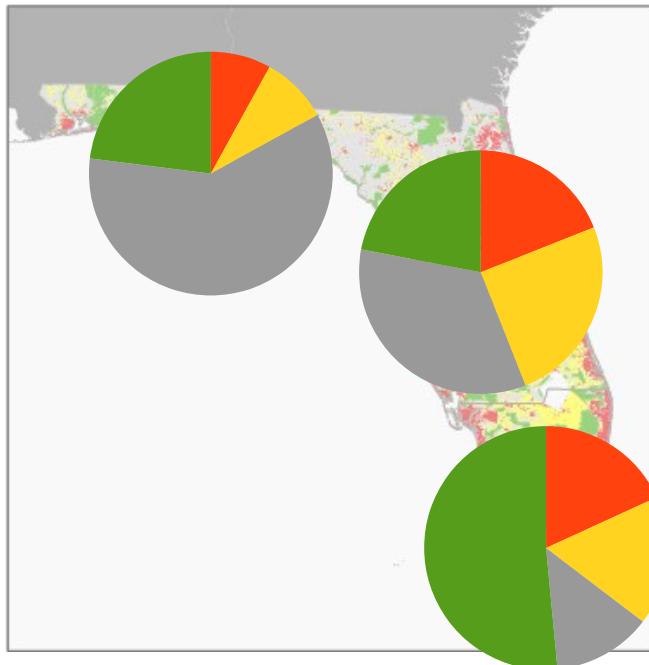
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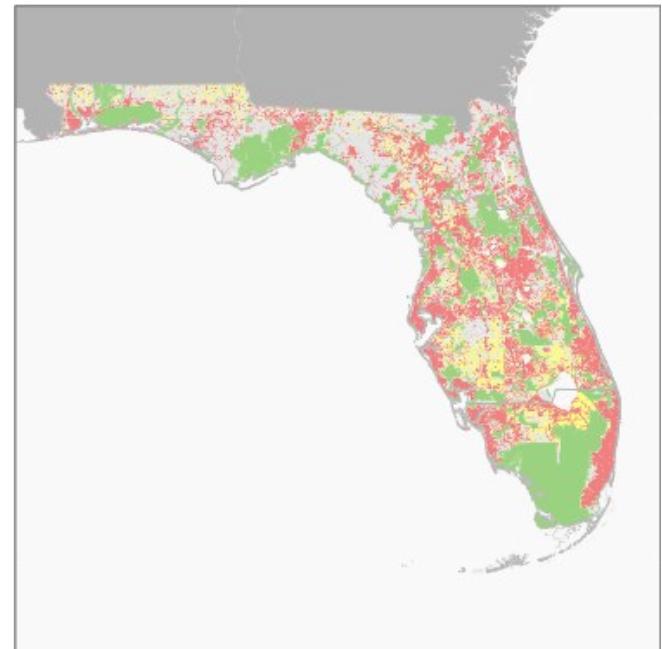
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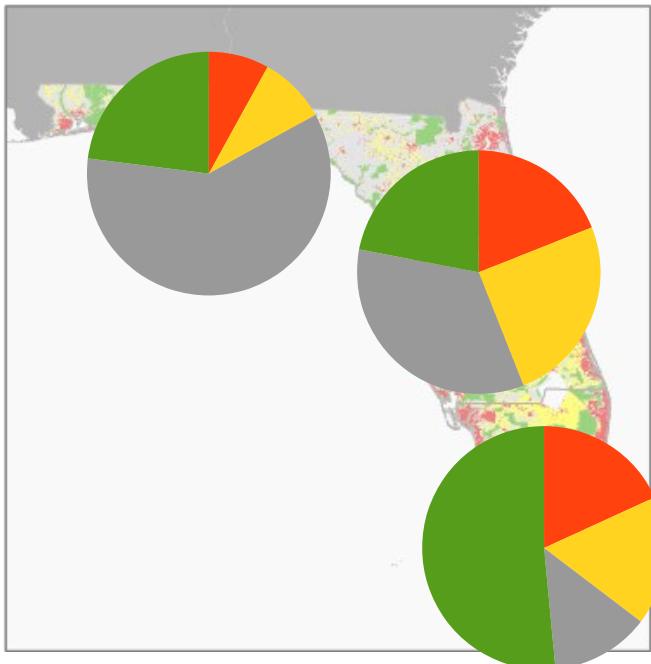
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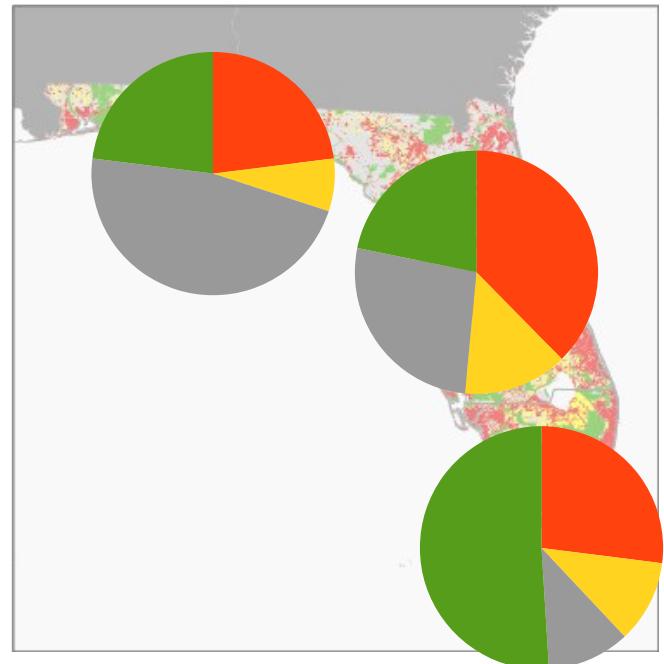
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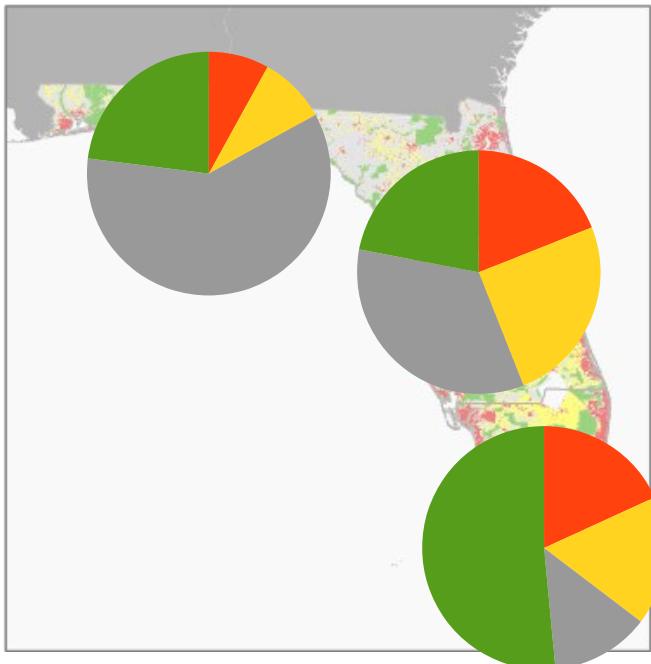
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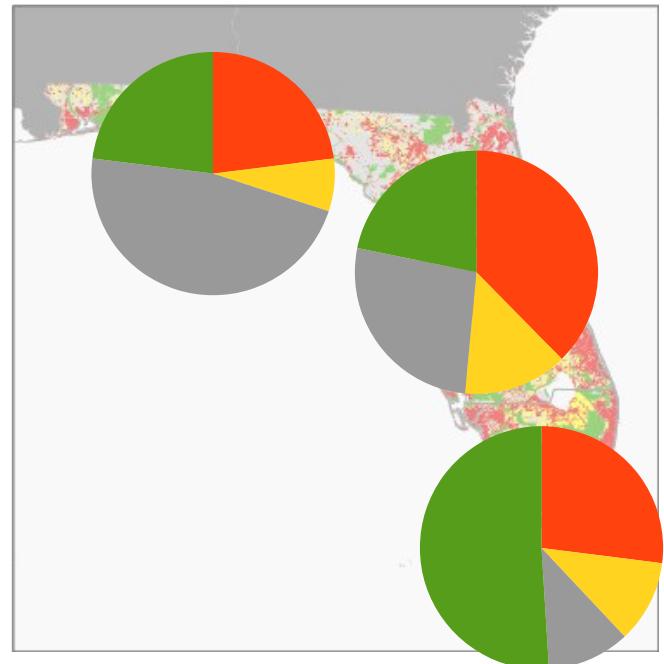
SO IS URBANIZATION...

Present

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2060



WILDLIFE IN FLORIDA

Florida black
bear

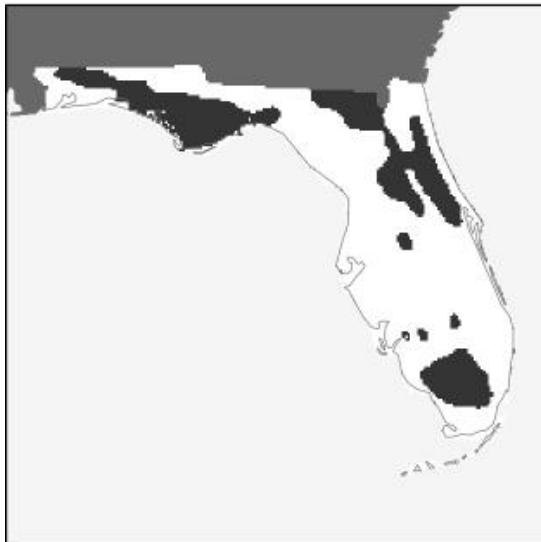


UF

WILDLIFE IN FLORIDA



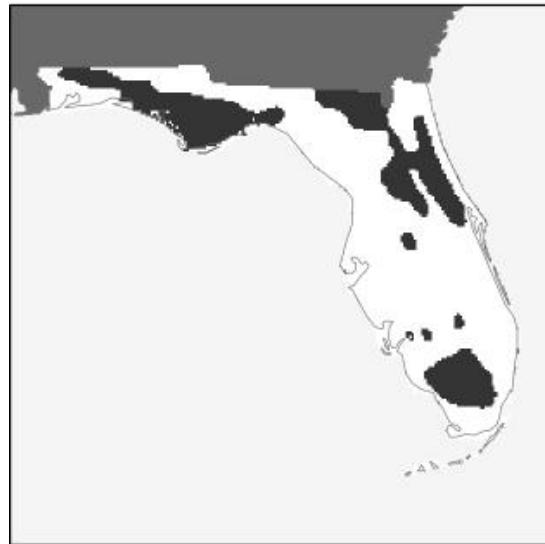
Present range



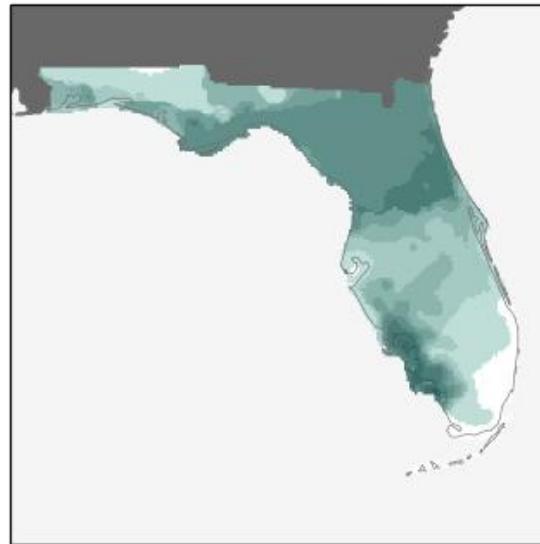
WILDLIFE IN FLORIDA



Present range



Climate only

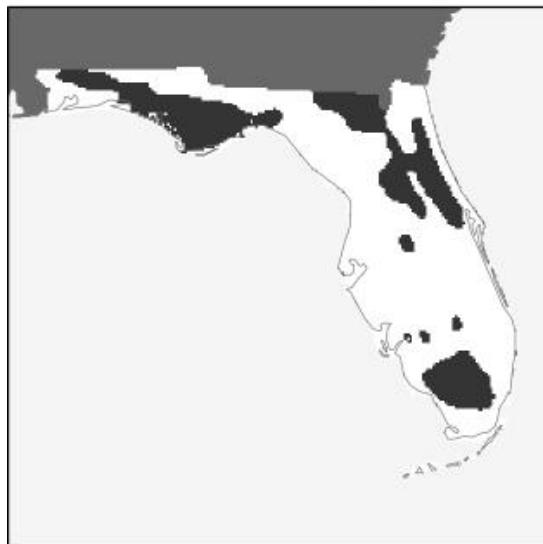


UF

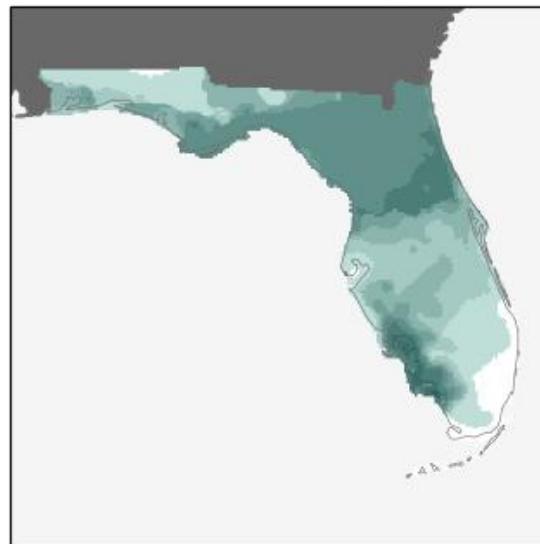
WILDLIFE IN FLORIDA



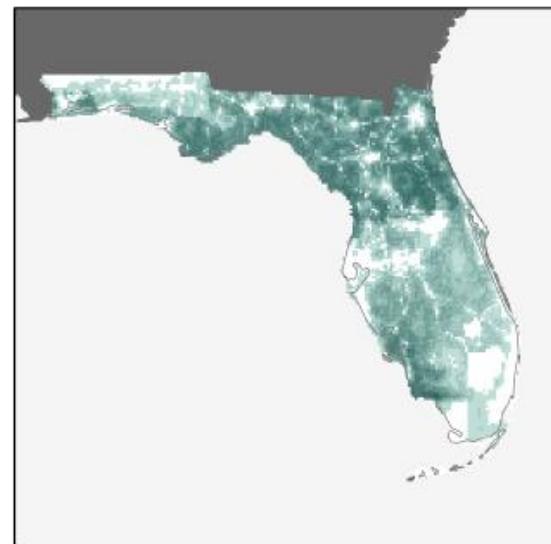
Present range



Climate only



Climate + human influence



WILDLIFE IN FLORIDA

Florida
sand skink



UF

WILDLIFE IN FLORIDA



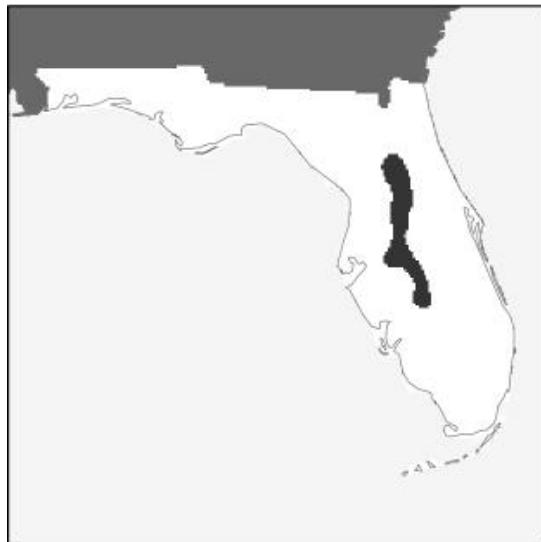
Present range



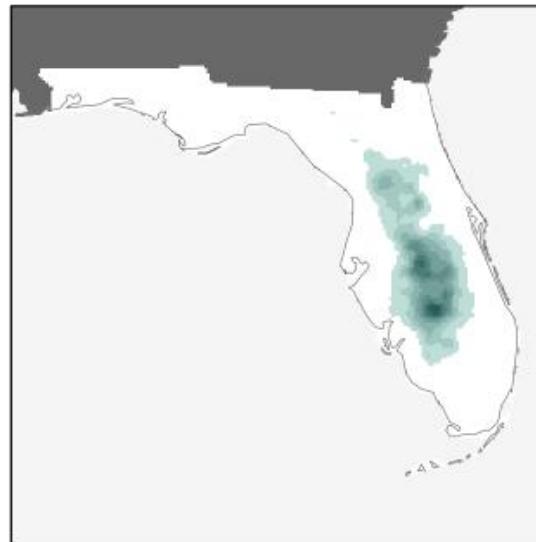
WILDLIFE IN FLORIDA



Present range



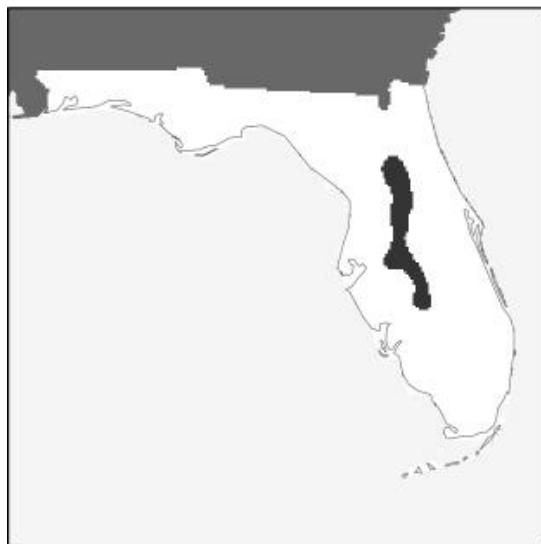
Climate only



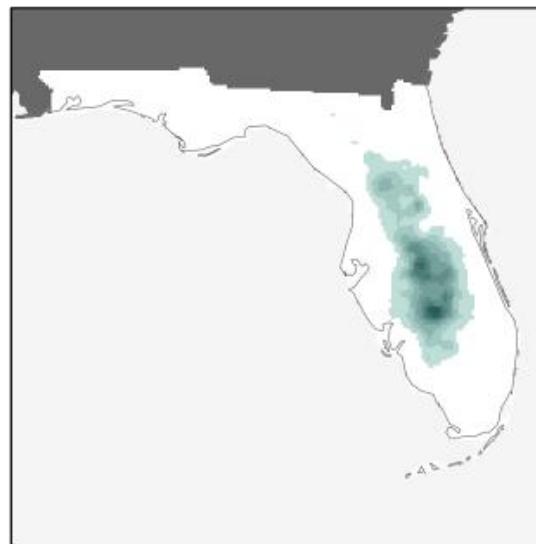
WILDLIFE IN FLORIDA



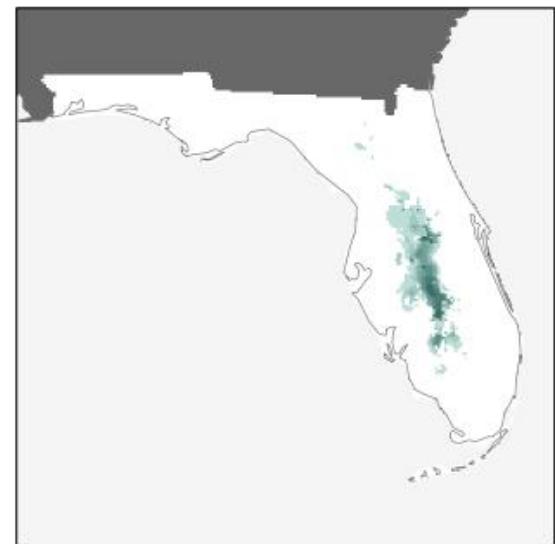
Present range



Climate only



Climate + human influence



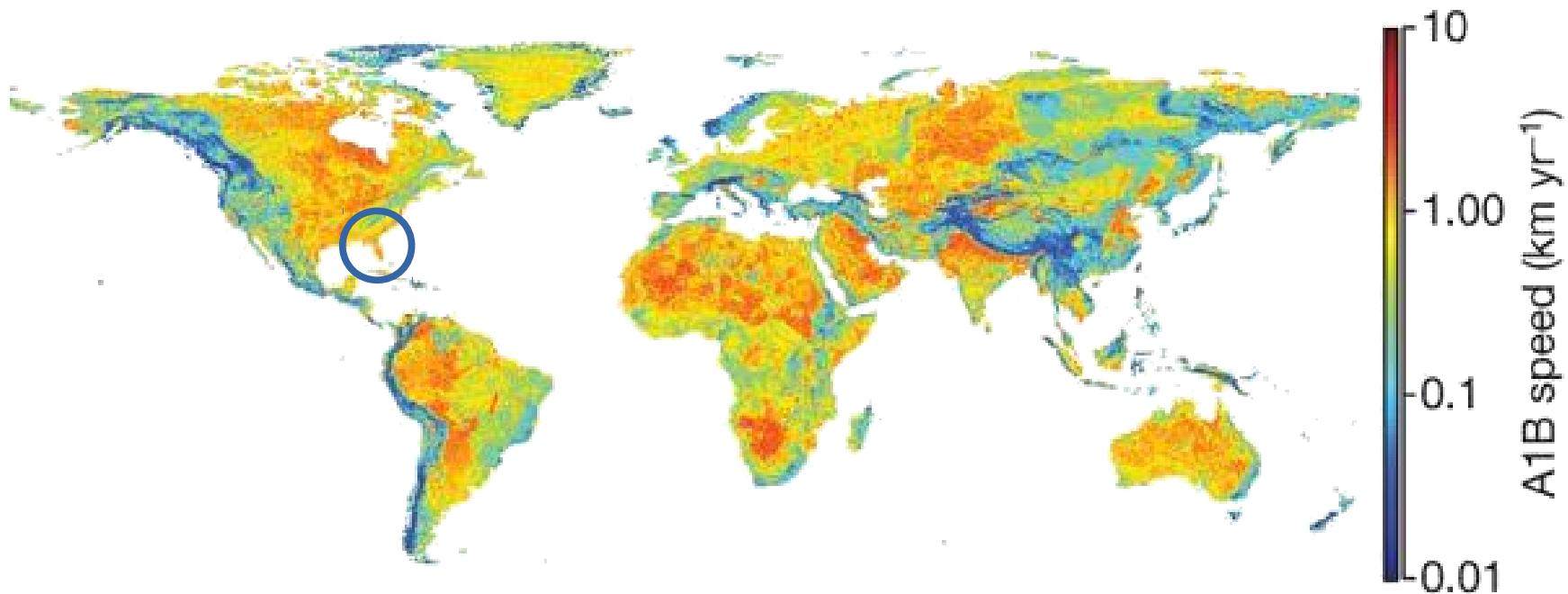


*IS CLIMATE CHANGING MORE RAPIDLY
THAN SPECIES CAN ADAPT?*



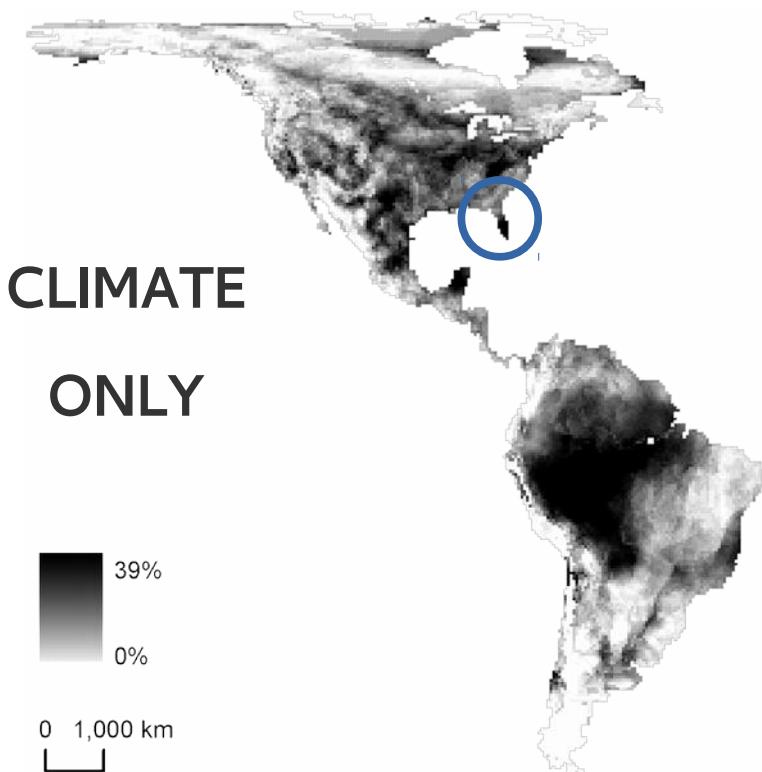
CLIMATE VELOCITY

2000-2100



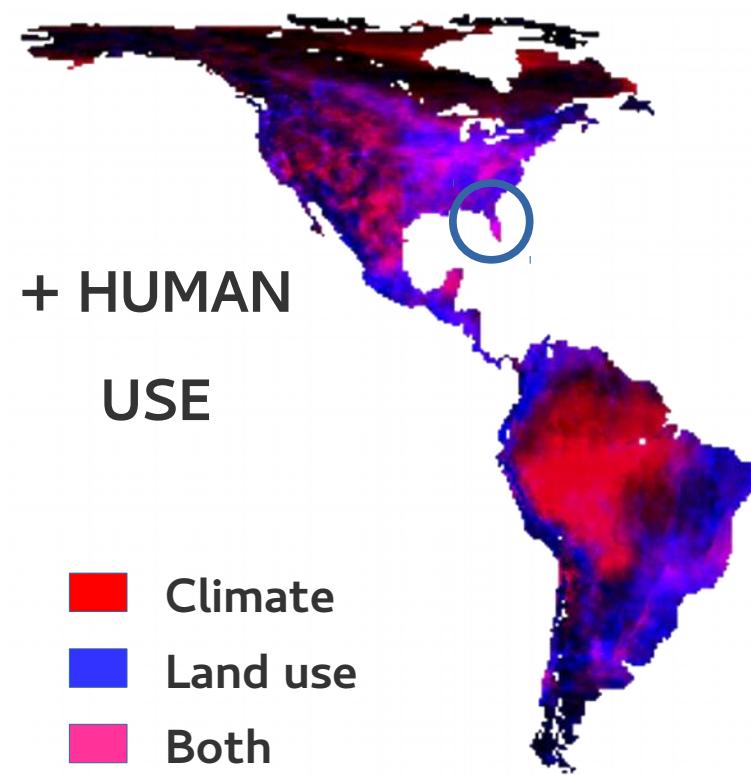
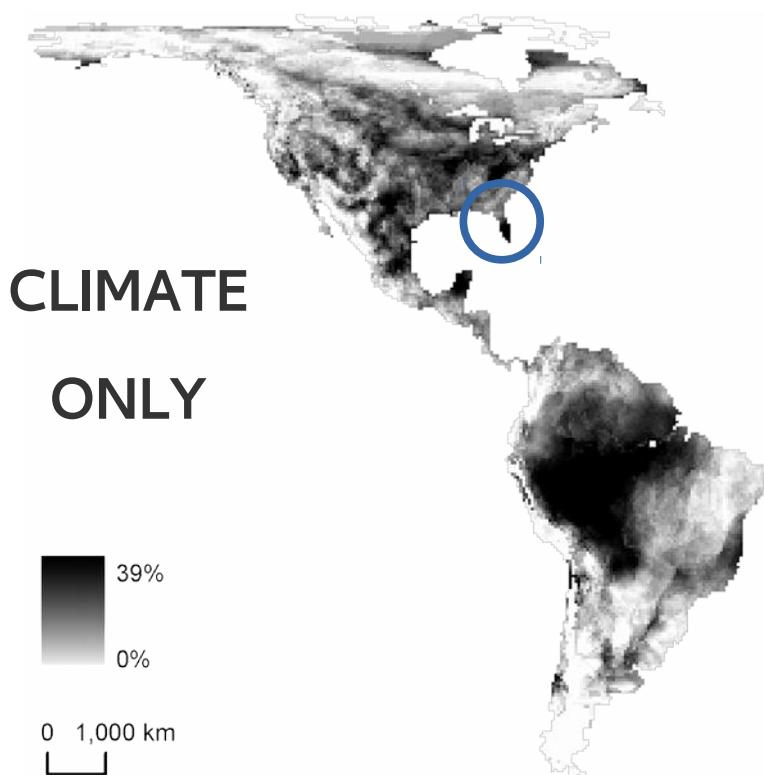
DISPERSAL VS. GLOBAL CHANGE

Mammals' inability to keep up with change



DISPERSAL VS. GLOBAL CHANGE

Mammals' inability to keep up with change

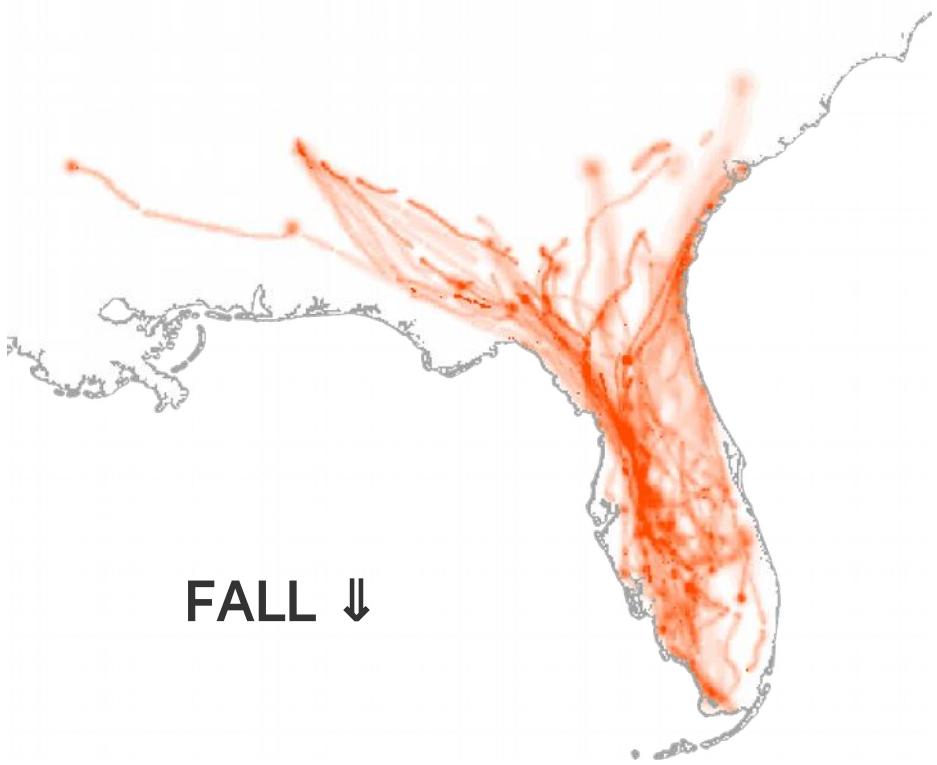


MOVEMENT CORRIDORS?

Wood stork

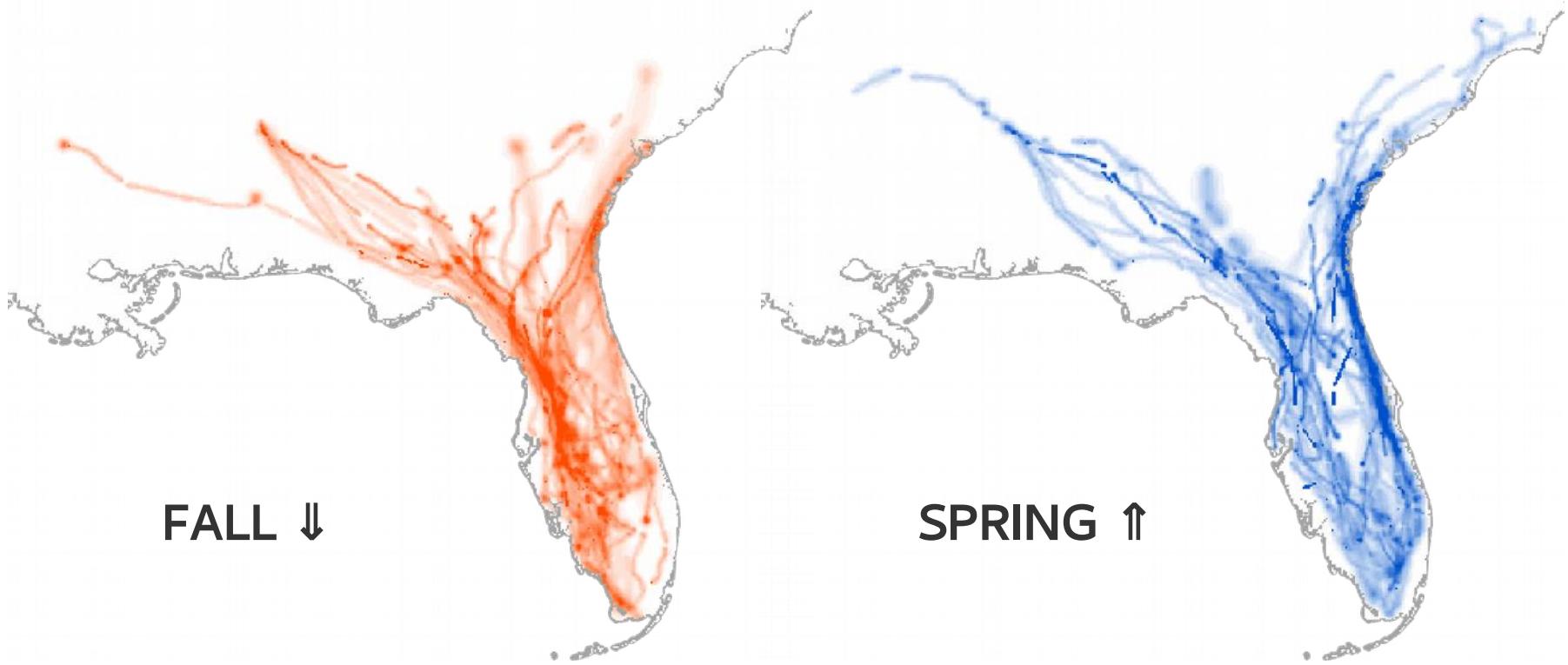


MOVEMENT CORRIDORS?



UF

MOVEMENT CORRIDORS?



UF



Thanks for your attention!
Contact me: basille@ufl.edu