OBSERVED/PROJECTED CLIMATE CHANGES AND ASSOCIATED IMPACTS FOR INDIAN RIVER COUNTY, FLORIDA

Projected Trends % CHANGE BY 2100 ● Models vary

▼▼	▼	–	▲	▲▲
	-30%	-5%	+5%	+30%

CLIMATE CHANGES	METRIC	TREND	OBSERVED/PROJECTED CHANGES
Air temperature	Minimum temperature AVG DAILY MIN TEMP (°F)	▲	66.1°F (+3.6°F) by 2050 and 70.2°F (+7.7°F) by 2100[1] COMPARED TO HISTORICAL AVERAGE OF 62.5°F FROM 1961–1990
	Maximum temperature AVG DAILY MAX TEMP (°F)	▲	86.5°F (+3.8°F) by 2050 and 90.7°F (+8.0°F) by 2100[1] COMPARED TO HISTORICAL AVERAGE OF 82.7°F FROM 1961–1990
Extreme heat	Days over 95°F # OF DAYS WITH MAX TEMPS >95°F	▲▲	48.8 days (+1,478%) by 2050 and 138.5 days (+4,196%) by 2100[1] COMPARED TO HISTORICAL AVERAGE OF 3.3 DAYS PER YEAR FROM 1961–1990
Precipitation	Annual precipitation AVG INCHES PER YEAR	–	53.1 in (+1.8%) by 2050 and 49.4 in (–3.5%) by 2100[1] COMPARED TO HISTORICAL AVERAGE OF 51.2 INCHES PER YEAR FROM 1961–1990
	Seasonality	▲▼	Significant decrease in summer rainfall (-21.1% by 2100), with smaller changes in spring (-8.4%) and fall (+8.9%); no change in winter rainfall[2]
Extreme precipitation	Amount 20-YEAR RETURN PERIOD TOTAL	▲	+21% increase in amounts during 20-year events projected by 2100[3]
	Frequency # OF DAYS WITH 2” RAIN IN 24 HOURS	▲	1.2 days (0%) by 2050 and 1.3 days (+8%) by 2100[1] COMPARED TO HISTORICAL AVERAGE OF 1.2 DAYS PER YEAR FROM 1961–1990
Sea level rise	Relative sea level change INCREASE FROM SEA LEVEL IN 2000	▲▲	1.4 ft (range 0.7–1.8) by 2040; 3.2 ft (1.2–4.4) by 2070; 7.4 ft (1.9–11.2) by 2120, with up to 14.3 ft possible under the most extreme scenario[4]
High-tide flooding	Days with high tides >1.8 FT OVER MHHW	▲▲	97 days per year (range 17–176) by 2040; 364 days per year (range 66–365) by 2070; 365 days per year (range 148–365) by 2100[5] COMPARED TO RECENT AVERAGE OF 2.1 DAYS PER YEAR FROM 1995–2016
Hurricanes	Intensity MAGNITUDE OF SURFACE WINDS	▲	+8% per decade in global hurricane intensity from 1979–2017[6]
	Speed	▼	-16% in rate of forward motion for North Atlantic hurricanes from 1949–2016, significantly increasing local rainfall totals[7]

[1] U.S. Climate Resilience Toolkit Climate Explorer (https://crt-climate-explorer.nemac.org), generated using the high-emissions (RCP 8.5) scenario for the average of 2041–2049 and 2091–2099 time periods compared to historical conditions (average of 1961–1990).

[2] Alder, J. R. and S. W. Hostetler, 2013. USGS National Climate Change Viewer. US Geological Survey (https://doi.org/10.5066/F7W9575T), generated using the high-emissions (RCP 8.5) scenario for the mid-century (average of 2025–2049) and late-century (average of 2075–2099) time periods compared to recent conditions (average of 1981–2010).

[3] D. R. Easterling et al., in Climate Science Special Report: Fourth National Climate Assessment, Volume I, D. J. Wuebbles et al., Eds. (U.S. Global Change Research Program, Washington, DC, 2017), pp. 207–230.

[4] U.S. Army Corps of Engineers Sea-Level Change Curve Calculator (Version 2021.12) (https://cwbi-app.sec.usace.army.mil/rccslc/slcc_calc.html), using NOAA et al. 2017 relative sea level change scenarios calculated for an interpolated grid point between the Trident Pier and Virginia Key tide gauges; NOAA Intermediate-High scenarios are presented (range represents Intermediate-Low to High scenarios, which encompass all likely possibilities). Calculation includes vertical land movement of 0.066 ft/year at the interpolated grid point, and compares future sea levels with 2000 mean sea levels.

[5] W. V. Sweet et al., Patterns and Projections of High Tide Flooding Along the U.S. Coastline Using a Common Impact Threshold. (NOAA Tech. Rep. NOS CO-OPS 86, 2018); data presented for Trident Pier tide gauge for Intermediate High scenarios (range represents Intermediate-Low to High scenarios) compared to recent conditions (1995–2016).

[6] J. P. Kossin, K. R. Knapp, T. L. Olander, C. S. Velden, PNAS. 117, 11975–11980 (2020).

[7] J. P. Kossin, Nature. 558, 104–107 (2018).

LIKELY IMPACTS ASSOCIATED WITH PROJECTED CLIMATE CHANGES*	
Utilities	• Damage to critical infrastructure (e.g., wastewater treatment plants) during flood events • Reduced pump station capacity and/or increased risk of failure during flooding events and increasingly frequent high-tide flooding • Increased energy demand during heat waves, potentially straining electrical grids and increasing costs for users • Increased concentration of contaminants and increased risk of algal blooms in water sources water sources during warm, dry and/or drought periods, reducing effectiveness of water treatment
Transportation	• Damage to transportation infrastructure (e.g., roads, bridges, culverts) following storms, floods, and extreme heat • Road blockages and loss of access following extreme events, impacting evacuation routes, emergency access, and other critical travel • Slower travel or road closures due to melting asphalt, overheating engines, and other impacts associated with extreme heat • Loss of electricity due to flooding or heat waves, limiting use of electric vehicles and impacting public transit • Decreased use of non-motorized transit due to more frequent/severe inclement weather • Inundation of coastal roads and bridges due to sea level rise
Conservation Lands & Parks	• Reduced growth and productivity of native vegetation due to heat stress and increases in evapotranspiration • Increased risk of harmful algal blooms in freshwater, estuarine, and nearshore marine environments, impacting water quality and potentially causing widespread mortality of fish and other aquatic organisms • Changes in plant survival due to more frequent coastal inundation and/or saltwater intrusion into freshwater habitats, likely altering the distribution of native plant communities (e.g., salt marsh vegetation) • Potential increase in insect pests and diseases, with associated impacts to native plants and wildlife • Increased heat stress for people using parks and recreation areas as well as changes in patterns of recreational use (e.g., heavier use of sites with water features, increases in maintenance costs) • Decreased accessibility/use and increased maintenance costs of park lands due to flooding • Altered or decreased ecosystem functioning on conservation lands due to changes in hydrology and changes in plant species composition and distribution

* All icons from the Noun Project: (1) Utilities icon created by Juan Pablo Bravo; (2) Road icon created by Jorge Namos; (3) Park icon created by Vectors Point

Resources:

- USGS National Climate Change Viewer (https://doi.org/10.5066/F7W9575T)
- U.S. Climate Resilience Toolkit Climate Explorer (https://crt-climate-explorer.nemac.org)
- Southeast Chapter of the Fourth National Climate Change Assessment (https://nca2018.globalchange.gov/chapter/19/)
- Southeast Florida Regional Climate Change Compact Sea Level Rise Work Group (Compact). February 2020 (https://southeastfloridaclimatecompact.org/wp-content/uploads/2020/04/Sea-Level-Rise-Projection-Guidance-Report_FINAL_02212020.pdf)
- NOAA Sea Level Rise Viewer (https://coast.noaa.gov/slr/)
- Surging Seas Risk Zone Map (https://ss2.climatecentral.org/)

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