

# Appendix D

## **Climate**



**TABLE D-1  
POTENTIAL EFFECTS OF CLIMATE CHANGE AND THREATS TO AIRPORTS**

Effect of Climate Change / Threat to Airports	Potential Effect	Potential Remedies
<i>Sea Level Rise:</i> The International Panel on Climate Change (IPCC) and National Oceanic and Atmospheric Administration (NOAA) provide local, predictive models to describe a spectrum of SLR scenarios between intermediate low, which relates to slow, incremental SLR, and extreme, which is a more rapid and aggressive potential outcome*		
<ul style="list-style-type: none"> <li>Ocean inundation, including increased incidence of tidal flooding</li> </ul>	Restricted runway use, damage to runway and other electrical circuits	Shoreline management, extensive dewatering systems, extend runways or limit aircraft operations due to chronic or persistent wet pavements, which require additional length for safe aircraft operations; relocation
<ul style="list-style-type: none"> <li>Saltwater intrusion</li> </ul>	Increased corrosion and weathering	Constant repair of subsurface or surface infrastructure
<ul style="list-style-type: none"> <li>Increased water table</li> </ul>	Problematic stormwater collection/movement restricts storm water drainage potential (disruption/stagnation of hydraulic gradient)	Modification to storm water system
<i>Increased Frequency of Extreme Temperatures:</i> defined as days over 95°F that may be experienced more frequently and for longer consecutive durations in comparison to known historic patterns. Over the past 48 years, Palm Beach has recorded an average of 65 days each year of temperatures over 90 degrees Fahrenheit (°F), the hottest months being July and August**		
	Pavement weathering, warping, cracking, or softening, (especially areas of heavy use and/or high wheel pressure, such as turn areas)	Immediate intervention and renovation required due to safety concerns; otherwise, may require accelerated pavement maintenance schedule (currently 20-30 years)
	Increased energy demand	Higher cost for indoor cooling; HVAC system failure; retrofit increased efficiency measures in existing structures; installation of industrial fans or other air circulation methods in areas not currently climate-controlled; cumulative strain on regional utility provider
	Decreased aircraft performance	Operational restrictions; runway extension requirement; increased fuel consumption to compensate for aircraft inefficiencies
	Facility weathering	Increased maintenance requirements; reconstruct with more durable materials

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<i>Climate shift:</i> may increase the length of rainy seasons and the duration/intensity of precipitation events in some areas, while causing extended precipitation deficits and protracted droughts in other locations. This change may be experienced in southern Florida with altered seasonality, producing drier springs and summers and profoundly wetter falls and winters. ***		
<ul style="list-style-type: none"> <li>Altered rainfall patterns/increased volume and frequency of precipitation events</li> </ul>	Decreased visibility, navigation limitations, and flooding of active airfield movement areas	Mitigate user frustration from frequent storm-related weather delays
	Flooding; decreased capacity of stormwater collection design; establishment of standing water habitat	Modify storm water system; extend runways or limit aircraft operations due to chronic or persistent wet pavements, which require additional length for safe aircraft operations; fill wildlife attractant (e.g., wetland) areas
	Facility weathering	Increased maintenance requirements; reconstruct with more durable materials
	Increased contact between water and hazardous materials (water quality impacts)	Redesign or reconstruct hazardous material handling areas, including maintenance, fueling, de-icing, or sanitary areas; increased citations and fines for water quality infractions
	Increased scouring / erosion	Increase landscape maintenance and water quality reporting burden, including control sediment deposition in adjacent waterways per NPDES permit
<i>Increased Incidence of Extreme Storm Events:</i> refers to episodic storm events that can produce flash flooding, gusty winds, hail, or tornados. An increasing trend towards extreme storm events has been identified globally and correlated to an existing 0.5°C increase in average global temperature. In Florida, hurricane and other extreme storm events may increase in intensity in susceptible locations as climate change progresses. Palm Beach County has experienced approximately 22 hurricanes between 1888 and 2009. ****		
<ul style="list-style-type: none"> <li>High wind</li> </ul>	Structural damage or blockage from winds or from foreign objects and debris projectiles, especially airport lighting and signage which are on frangible mounts and designed to break away in aircraft impact.	Airport closes for storm / resumes within minimal timeframe.
<ul style="list-style-type: none"> <li>Intense rain, storm surge, and flooding</li> </ul>	Storm surge and flooding of paved surfaces restrict use until receded.	Airport focuses planning efforts on adaptive capacity and resilience of existing infrastructure and addresses deficiencies in advance of future storm event.
	Temporary, but high-volume water inundation may cause water intrusion to short or destroy sensitive electrical system, disrupt communications, or cause sewer overflow.	
	Increased vulnerability for hazardous material migration (fuel).	
	Extreme volume of standing water likely to temporarily overwhelm stormwater management system.	

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Widespread regional damage in adjacent communities.	Airport is needed as essential regional facility for evacuation and for import and staging of supplies after storm passes and damages are assessed	Airport repurposes available area for staging and operations; increases staffing and operational flexibility.

## REFERENCES:

- \* International Panel on Climate Change (IPCC), 2018. *Summary for Policymakers. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty* [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, Maycock, M. Tignor, and T. Waterfield (eds.)]. World Meteorological Organization, Geneva, Switzerland, 32 pp. Accessed in November 2020 at: <https://www.ipcc.ch/sr15/chapter/spm/>
- \* National Oceanic and Atmospheric Administration (NOAA), 2019. Sea Level Rise Viewer. Accessed in November 2020 at: <https://coast.noaa.gov/slr>
- \*\* Southeast Regional Climate Center, University of North Carolina Chapel Hill, NC. 2015. *Number of Days with Max Temperatures Equal to or Above 90°F for Selected Cities in the Southeast*. Accessed in November 2020 at: <https://sercc.com/climateinfo/historical/mean90.html>
- \*\*\* National Aeronautics and Space Administration (NASA), 2019. *Precipitation Measurement Missions: Climate Change, Trends and Patterns* accessed in November 2020 at: <https://pmm.nasa.gov/science/climate-change> and NASA 2013, *National Climate Assessment: 21st Century Precipitation Scenarios* accessed in November 2020 at: <https://svs.gsfc.nasa.gov/4028>
- \*\*\*\* Historical Society of Palm Beach County, 2009. Timeline of Hurricanes. Accessed in November 2020 at: <http://www.pbchistoryonline.org/page/hurricane-timeline>

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