

Gathering Operational Thresholds

Generic Standards and Thresholds

Example thresholds and their impacts from a variety of vulnerability assessments and literature source.

Component	Hazard	Example Threshold	Impact
Ports			
Operations	Extreme Heat	1°C warming = 5% increase in energy costs (in one illustrative terminal)	Energy costs
Paved surfaces		Depends on asphalt pavement grade	Asphalt pavement softening
Cranes	Heavy Rain	In Manzanillo, intense rainfall > 20 mm within 24 hours reduces visibility enough to impair operations	Low visibility inhibits crane operation
Goods handling		Precipitation > 1 mm within 24 hours	Inability to handle water-sensitive goods
Operations	Flooding	Conditions that cause flooding will vary by facility.	Flooding in some locations of the port could impair operations.
Docks	Tidal Flooding	Dock elevation/quay height	Flooding
Cranes	Wind Speeds	Varies by crane type. For example, 25 m/s (56 mph, 48.6 knots) for a CONTECON SSA	Ability to operate
Navigational channel		Varies by facility. For example, at Kingston Container Terminals (KCT) in Jamaica: <ul style="list-style-type: none"> Winds ≥ 18 m/s (40.3 mph, 35 knots) force operational shutdown With winds of 12.8-18 m/s (28.8-40.3 mph, 25-35 knots), discretion is applied 	Ability to berth ships (due to waves)
Airports			
Runways	Extreme Heat	Runway length requirement varies based on plane type, weight, and runway length. Rule of thumb: Runway length requirements increase by 1% for every 1°C by which the mean daily maximum temperature of the hottest month exceeds 15°C (assuming runway is at sea level) (ICAO, 2006)	Ability of aircraft to take off
Flight operations		47.7°C (118°F)	Aircraft maximum take-off operational temperature
Personnel		Heat Index* over 39.4°C (103°F) is "high" risk Heat Index* over 46°C (115°F) is "very high" risk	Reduced employee ability to work safely outdoors (need for more breaks)
Flight operations	Heavy rain	Varies by airport	May decrease runway friction to aircraft cannot take off
Flight operations	Flooding	Any flooding on the runway can impair operations. Conditions that cause flooding will vary by airport.	Inability of aircraft to land or take off
Flight operations	Sea Level Rise	Runway elevation	Flooding on the runway
Flight operations	Wind Speeds	Commercial airports: sustained winds of 20 m/s (45 mph, 39 knots) or frequent gusts of 26 m/s (58 mph, 50.4 knots) General Aviation airports: 11.2 m/s (25 mph, 21.7 knots)	Inability of aircraft to land or take off

*Heat Index is a function of temperature and relative humidity. See http://www.nws.noaa.gov/om/heat/heat_index.shtml. For a relative humidity of 70%, Heat Index would exceed 39.4°C (103°F) at 32.2°C (90°F) and would exceed 46°C (115°F) at 34°C (94°F).

UNCTAD Regional Workshop: "Climate change impacts and adaptation for coastal transport infrastructure in the Caribbean"

Worksheet

Operational Thresholds:

Component	Hazard	Variable	Threshold	Impacts	