SECTION 3

AIRPORT AND AIRSPACE CONSIDERATIONS

3.1 INTRODUCTION

In developing an airport Noise Exposure Map (NEM), as discussed in **Section 1.1**, it is necessary to understand the characteristics of the airport layout and the surrounding airspace. These characteristics include existing conditions, as well as any changes that are planned to occur in the future. The Airport Master Plan (AMP) is a key document for reference because it assesses the airport's long-range needs and identifies a time frame for addressing those needs.

3.2 AIRFIELD CONFIGURATION

Key West International Airport (EYW) is located on the southeast corner of the island of Key West. The FAA 5010 Airport Master Record for EYW indicates the airport reference point, which defines the midpoint of the airfield, is located at 24°33'22.031"N Latitude and 81°45'35.841"W Longitude (NAD 83) and the official airport elevation (the highest point on the runway) is 3.4 feet above mean sea level (AMSL).

The Key West International Airport Master Plan Update, completed in September 2019, includes an inventory of existing conditions in Chapter 2 and describes the capital improvements proposed for the airport through 2035 in Chapter 8. The following information is from the Airport Master Plan Update.

Runway 09-27, the only runway at EYW, is 5,075 feet long and 100 feet wide. Runway 09-27 consists of an asphalt overlay on asphalt concrete pavement and is able to accommodate aircraft weighing up to 195,000 pounds, including commercial jets, turboprops, military aircraft, and large general aviation aircraft (e.g., business jets). The runway was originally 4,801 feet long, but a project was completed in 2017 to increase the departure length of Runway 09 by approximately 274 feet, to 5,075 feet. This was accomplished by using existing overrun pavement.

Runway 09-27 is equipped with runway end identifier lights (REIL) to aid in identifying the approach end of the runway. The REIL system consists of a pair of synchronized flashing lights located laterally on each side of the runway threshold. When the airport traffic control tower (ATCT) is closed (between the hours of 9:00 p.m. and 7:00 a.m.), the REILs and medium intensity runway lights (MIRL) can be activated by pilots using the Common Traffic Advisory Frequency 118.200. This ability for pilots to activate runway lights is common at airports.

Visual glide slope indicators aid pilots in judging the correct approach slope of the aircraft toward the touchdown zone of a runway. Precision approach path indicators (PAPIs) are a system of lights that may be visible for up to 5 miles during the day and up to 20 miles or more at night. PAPI systems use light units that are installed in a single row of either two or four light units. Each set of lights is designed to appear as either white or red, depending upon the approach angle. When the pilot is approaching the lights at the proper angle, the first set of lights appears white, and the second set appears red. When both sets appear white, the pilot is flying too high, and when both appear red, the pilot is flying too low. Runway 09-27 has a four-light PAPI system located at each runway end.

The taxiway system provides access between the runway and various aircraft parking aprons throughout the airfield. Currently, the Taxiway A reaches the previous end of Runway 09 (the location prior to the 2017 extension) and pilots that want to use the full 5,076 feet of available runway length must back-taxi on the runway. Back-taxiing is when an aircraft taxies on a runway in the opposite direction of the aircraft's take-off or landing direction. This occurs when the taxiway does not extend to the end of the runway – which is the case at EYW.

There are three anticipated changes in airfield configuration between the existing condition NEM (2022) and the future condition NEM (2028). The first change is the extension of Taxiway A to the west to provide full-length taxiway access to the extended Runway 09 end. This full-length parallel taxiway will enable aircraft departing to the east on Runway 09 to use the entire runway without the need to back-taxi on the runway. The second change is the provision of an additional 5,000 square yards of aircraft parking apron west of the existing west apron. This additional apron will accommodate an estimated 45 single-engine aircraft, 4 multi-engine aircraft, and 4 small jets. The third change is the expansion of the commercial terminal apron to accommodate additional aircraft during peak periods and during special events.

3.3 AIRSPACE/AIR TRAFFIC CONTROL PROCEDURES

Airport facilities, flight services, and restricted and special use airspace associated with an aircraft in flight were considered in the airspace inventory. Factors inventoried included:

- military installations;
- public and private airports and heliports;
- civil and military flight corridors;
- navigational and visual aids applicable to EYW;
- military restricted and operational areas;
- special use airspace; and
- landing approaches to the airport.

Airspace features and air traffic control procedures that occur within 25 nautical miles (nm) of EYW are listed and described as follows.

3.3.1 Neighboring Airports

Airports within 25 nautical miles (nm) of EYW included on the FAA VFR Miami Sectional Aeronautical Chart (August 12, 2021) are shown on **Figure 3.1**. The only heliport within 25 nm of EYW is the Florida Keys Memorial Hospital Heliport. Airport and heliports within 25 nm of EYW are listed in **Table 3.1**.

TABLE 3.1
AIRPORTS AND HELIPORTS WITHIN 25 NM OF EYW

Name	Code	Ownership	Distance and Direction from EYW	
Name			Distance	Initial Heading
Florida Keys Memorial Hospital Heliport	7FA0	Private	2 nm	27° (NE)
NAS Key West /Boca Chica Field	NQX	U.S. Navy	4 nm	75° (E)
Sugar Loaf Shores Airport	7FA1	Private	11 nm	61° (NE)
Summerland Key Cove Airport	FD51	Private	18 nm	71° (E)

Source: Great Circle Mapper, 2021

Prepared by: Deborah Murphy Lagos & Associates

3.3.2 Operational Procedures

Operational procedures within EYW airspace are subject to certain restrictions due to the proximity of NAS Key West. EYW and NAS Key West airspace overlaps as shown on **Figure 3.1**. Operations within each airspace are coordinated by the NAS Key West Airport Traffic Control Tower (ATCT) and radar approach/departure control (RAC) personnel. Aircraft landing at EYW are handed off from NAS Key West ATCT to EYW ATCT personnel once there is no conflict with other traffic.

The EYW ATCT is staffed and operational from 7:00 a.m. to 9:00 p.m. daily. NAS Key West ATCT and RAC facilities are operational from 7:00 a.m. to midnight. They interface with the Miami Air Route Traffic Control Center (ARTCC). The ARTCC provides airspace services to the combined airspace from midnight to 7:00 a.m. All ATCT and radar facilities are operational seven days a week.

According to the EYW ATCT Manager, an airspace delineation boundary has been established to identify overlapping airspace. Specific procedures are to be followed during visual meteorological conditions (VMC) and instrument meteorological conditions (IMC). During VMC, civil aircraft departing from Runway 9 are required to make a left turn and stay west of the boundary. Military aircraft stay east of the delineation boundary used by the ATCT. During IMC, NAS Key West ATCT and radar approach/departure control personnel provide position and altitude data to all aircraft. Departures from EYW are held whenever an instrument approach under IFR conditions is being conducted to either EYW or NAS Key West runways.

The EYW ATCT Manager provided further explanation of the interaction between EYW and NAS KW. The ATCT Manager stated that a restriction is placed on aircraft departing on Runway 09 (and Runway 27 if applicable) regarding the aircraft's climb profile. The 2000 ft restriction on the initial altitude for instrument departures was instituted by the previous Navy ATC Officer NAS Key West. That is the altitude that the Navy departure controller protects along the route of flight that the airplane will follow. THE NAS KW ATC must separate all (Navy) air traffic from the route and altitude of the Key West departure as it quickly gets into Navy airspace immediately after taking off from Key West Runway 09. It is the same for Key West airplanes departing off Runway 27. Once the NAS KW ATC sees that departure on radar and radar identifies it and gets in radio contact with the departure, the NAS KW ATC will issue further climb instructions based on the traffic at that point. EYW ATC would like the Navy to change that maximum initial altitude to a higher

value. NAS KW ATCs are authorized to give EYW ATCs a higher initial altitude upon request if there is no conflicting traffic.

Operating characteristics within the airspaces are as follows:

- <u>Overlapping Airspace</u> A line of demarcation has been established as shown on <u>Figure 3.1</u> to define areas of operation in the overlapping airspace.
 - <u>VMC Conditions</u> During visual meteorological conditions (VMC), civil aircraft departing EYW from Runway 09 are required to make a left turn and stay west of the line. Military aircraft stay east of the line by making their approaches on radials from the NAS Key West Runway 8 threshold when landing on that runway.
 - <u>IMC Conditions</u> During instrument meteorological conditions (IMC), NAS Key West ATCT and RAC personnel provide position and altitude data to all aircraft. Departures from EYW are held whenever an instrument approach under IFR conditions is made to either EYW or NAS Key West runways.
- <u>Warning Areas</u> NAS Key West and EYW airspace is adjacent to the Air Defense Identification Zone (ADIZ), the United States Defense Area, and numerous warning areas outside of FAA jurisdiction and over international waters. Traffic from the north and northeast is routinely routed clear of warning areas. The U.S. Navy states that some warning areas are used for high-speed aerial combat training including surface-to-air and air-to-air missile firings and anti-aircraft gunnery.
- <u>Balloons</u> Up to two Tethered Aerostat Radar System (TARS) Balloons, colloquially known as "Fat Alberts," are located 14 nm northeast of the airport. They are tethered to the ground with a large wire. The restricted airspace is a circular area 4 statute miles in diameter effective from the surface to 14,000 feet MSL, centered at lat. 24°42'03"N., long. 81°30'29"W, and is designated Restricted Area R-2916, Cudjoe Key, FL. The using agency is currently the U.S. Customs and Border Protection, Air and Marine Operations Center. The primary mission for the balloons is to provide low-level radar surveillance in the Florida Straits. The radar assists federal agencies in a national drug interdiction program. The secondary mission is to provide North American Aerospace Defense Command (NORAD) with low-level surveillance coverage for air sovereignty in the Florida Straits.

3.3.3 Flight Corridors

Low altitude Federal Airways in the vicinity of EYW, are shown on **Figure 3.1** and are listed in **Table 3.2**. Low altitude Federal Airways are corridors defined by radials between very high frequency omnidirectional radio range (VOR) ground radio stations. They provide navigational guidance to aircraft that are equipped with onboard equipment capable of receiving signals from those stations.

TABLE 3.2
FLIGHT CORRIDORS WITHIN 25 NM OF EYW

Flight Corridor	From	То	Bearing (°)		
Low Altitude Federal Airways					
V225	Key West VOR EYW	Lee County VORTAC	360°		
V539	Key West VOR EYW	Lee County VORTAC	015°		
V157	Key West VOR EYW	Miami VOR	037°		
V3	Key West VOR EYW	Miami VOR	082°		
V601	Key West VOR EYW	Pahokee VOR	019°		
B646	Key West VOR EYW	Marathon NDB	NA		
International Airways					
G765	Cozumel VOR CZM	Key West VOR EYW	NA		
B646	Merida VOR MID	Key West VOR EYW NA			

Note: NA Not Available

VOR Very High-Frequency Omni-Directional Radio Range

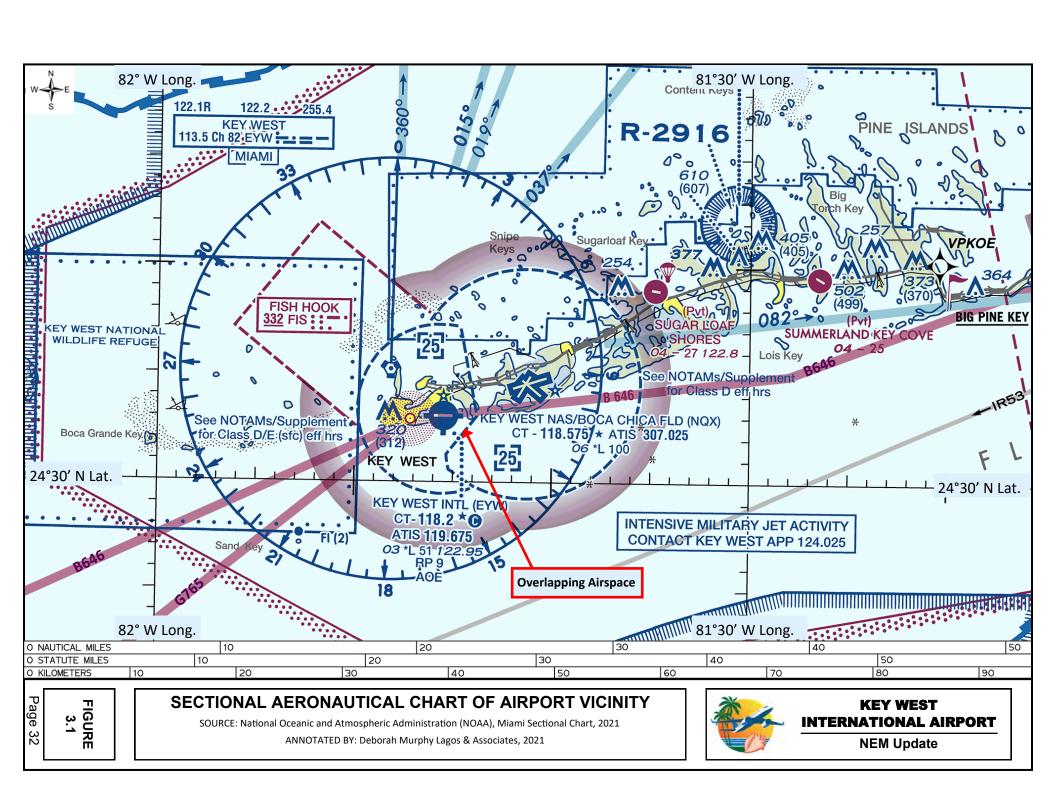
VORTAC Very High-Frequency Omni-Directional Radio Range and a Tactical Air Navigation system

NDB Non-Directional Radio Beacon EYW Key West International Airport CZM Cozumel International Airport

MID Manuel Crescencio Rejón International Airport, formerly known as Mérida-Rejón Airport

Source: FAA VFR Miami Sectional Aeronautical Chart (August 12, 2021)

Prepared by: Deborah Murphy Lagos & Associates



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Sectional Chart,

Miami

Oceanic and Atmospheric Administration (NOAA),

SOURCE: National

SECTIONAL AERONAUTICAL CHART LEGEND

FIGURE 3.2

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within and near mountain passes.

3.3.4 Existing Published Procedures

EYW currently has two published Area Navigation (RNAV) global positioning system (GPS) non-precision approaches, one to each runway end, and a nondirectional beacon (NDB) circling approach to either runway end, as shown on Figures 3.3 through 3.5. A non-precision instrument approach is one in which the pilot uses only horizontal navigational guidance to line the aircraft up with the runway. When flying such an approach, the pilot proceeds along the specified course and descends to the minimum descent altitude (MDA) while locating the runway. If the runway (or runway environment) is in sight, the pilot may land; otherwise, the pilot must execute a missed approach.

Existing published approaches (current as of August 12, 2021) to EYW, available to aircraft operators after obtaining clearance from the U.S. Navy approach control and the EYW ATCT, include the following:

RNAV (GPS) to Runway 09 - These approaches allow straight-in and circling approaches to Runway 09. The straight-in approach to Runway 09 has a minimum decision altitude (MDA) of 580 feet and visibility of 1 mile for approach categories A and B, an MDA of 580 feet and visibility of 1.5 miles for approach category C, and an MDA of 580 feet and visibility of 1.75 miles for approach category D. Circling approaches with an MDA of 580 feet and a visibility of 1 mile are allowed for approach category A and B, an MDA of 580 feet and visibility of 1.5 miles for approach category C, and an MDA of 620 feet and 2 miles visibility for approach category D are allowed.

RNAV (GPS) to Runway 27 - These approaches allow straight-in and circling approaches to Runway 27. The straight-in approach to Runway 27 has an MDA of 420 feet and visibility of 1 mile for approach categories A and B and an MDA of 420 feet and visibility of 1.25 miles for approach categories C and D. Circling approaches with an MDA of 500 feet and a visibility of 1 mile are allowed for approach category A and B, an MDA of 500 feet and visibility of 1.5 miles for approach category C, and an MDA of 620 feet and 2 miles visibility for approach category D are allowed.

NDB or GPS-A - This provides for a circling approach to EYW with an MDA of 500 feet and visibility of 1 mile for approach categories A and B, an MDA of 500 feet and visibility of 1.5 miles for approach category C, and an MDA of 620 feet and 2-mile visibility for approach category D. The NDB-A instrument approaches to EYW are conducted using the following navigational aids.

- Very High Frequency Omnidirectional Range Tactical Air Navigation (VORTAC) Key West VORTAC, 113.5 Channel 82 EYW.
- Non-Directional Beacon (NDB) Fish Hook (FIS) NDB, 332 FIS.

There are no published Standard Terminal Arrival (STAR) or Standard Instrument Departure (SID) Procedures for EYW.

3.4 METEOROLOGICAL DATA

The Florida Keys are a chain of islands that swing in a southwesterly arc from the southeast coast of the Florida peninsula, with the island of Key West being located near the western end this chain. Due to the nearness of the Gulf Stream in the Florida Straits, and the tempering effects of the Gulf of Mexico, the Florida Keys have a notably mild, tropical-maritime climate.

Diurnal temperature variations throughout the year range about 10 degrees. Winter cold fronts tend to be modified by the warm water as they move in from the north, keeping monthly average temperatures typically only 15 degrees lower in the winter than during the summer.

December through April, referred to as the dry season, receives roughly 25 percent of the annual rainfall, usually ahead of cold fronts. June through October is considered the wet season, receiving approximately 60 percent of the yearly rainfall total in showers and thunderstorms. Easterly waves during this season occasionally bring excessive rainfall, while infrequent hurricanes may be accompanied by unusually heavy amounts as well.

The climate in the vicinity of EYW is strongly influenced by the prevailing easterly trade winds, the proximity of the Gulf Stream, and the Gulf of Mexico. According to the National Weather Service in Key West, based on data from 1991 through 2020, the annual average temperature in Key West was 78.9°F, with an average annual maximum temperature of 83.7°F and an annual average minimum temperature of 74°F. Prevailing easterly winds ranged from 8.9 to 11.5 miles per hour (mph), with an annual average of 10.4 mph, as shown in **Table 3.3**. Maximum winds usually occur from October through April and originate from the east/northeast. The annual wind direction frequency is shown on **Figure 3.6**. Average wind direction frequency by month is shown on **Figures 3.7** and **3.8**.

TABLE 3.3
AVERAGE WIND SPEED AT EYW

1970-2016 Average:	Miles per hour (MPH)
Annual	10.4
January	11.2
February	11.1
March	11.5
April	11.5
May	10.3
June	9.5
July	8.9
August	9
September	9.1
October	10.5
November	11.5
December	11.1

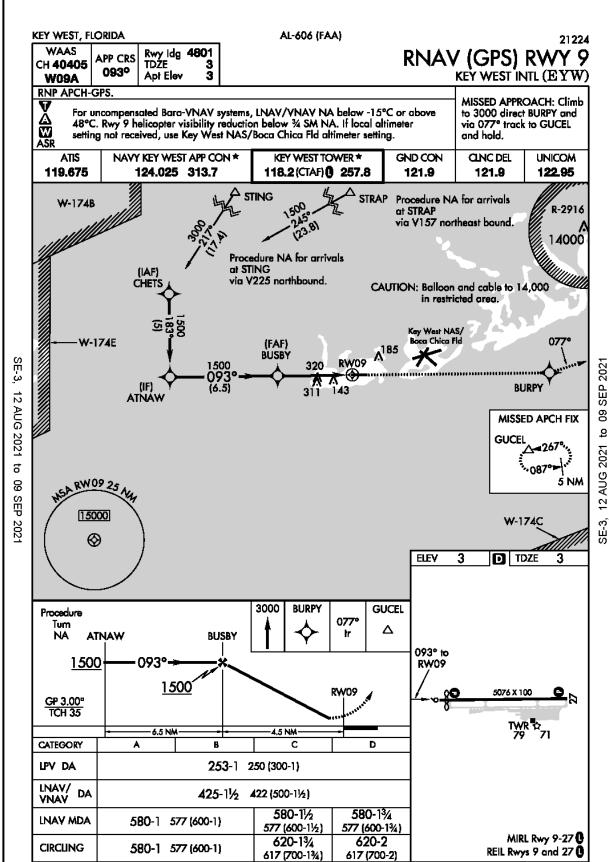
Source: US Department of Commerce, National Oceanic & Atmospheric Administration, National Weather

Service, Key West, FL, 2021

Prepared by: Deborah Murphy Lagos & Associates

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FIGURE 3.3



KEY WEST, FLORIDA Amdt 1A 15JUL21

24°33′N-81°46′W

KEY WEST INTL (EYW) RNAV (GPS) RWY 9

Source: Federal Aviation Administration. (12 Aug 2021 to 09 Sep 2021). SE-3. KEY WEST INTL (EYW) RNAV (GPS) RWY 27.

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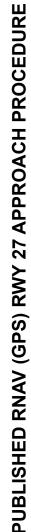
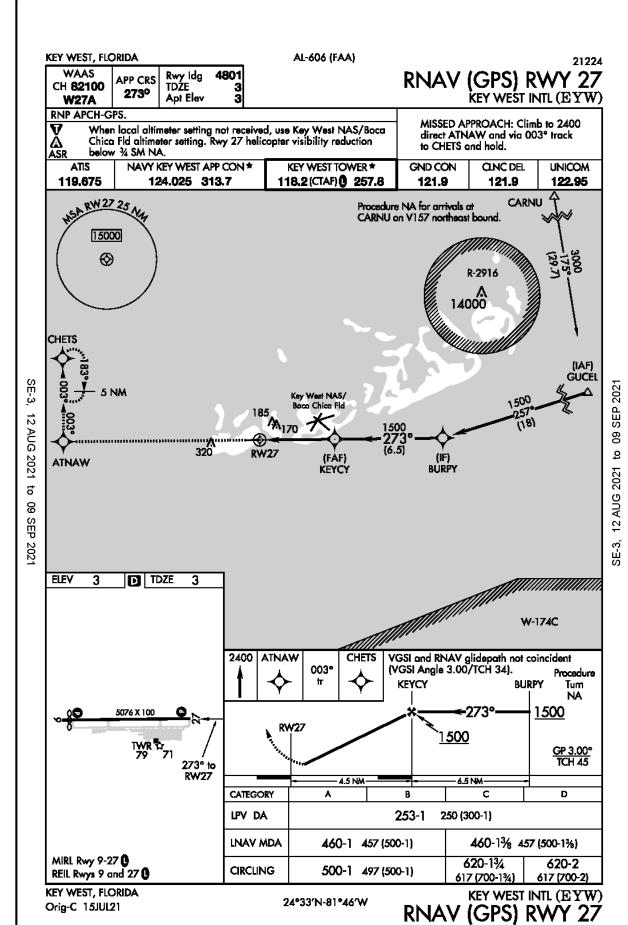


FIGURE 3.4

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Source: Federal Aviation Administration. (12 Aug 2021 to 09 Sep 2021). SE-3.

KEY WEST INTL (EYW) RNAV (GPS) RWY 9.

Source: Federal Aviation Administration. (12 Aug 2021 to 09 Sep 2021). SE-3.

KEY WEST INTL (EYW) NDB-A.

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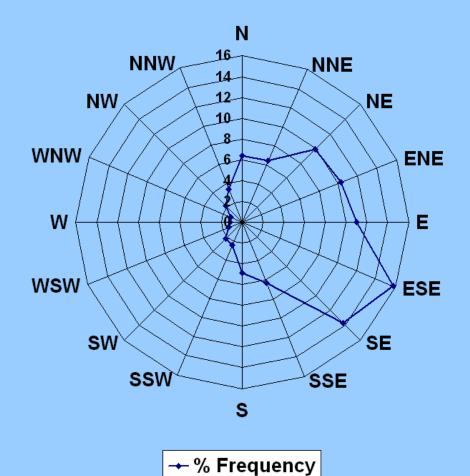
PUBLISHED NDB-A APPROACH PROCEDURE

FIGURE 3.5

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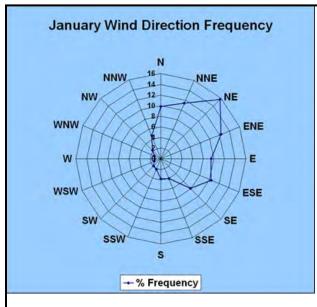
Annual Wind Direction Frequency

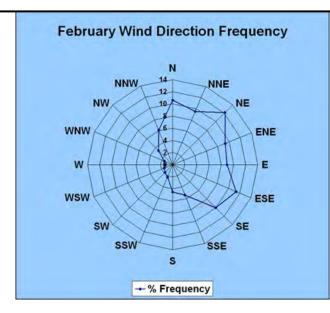


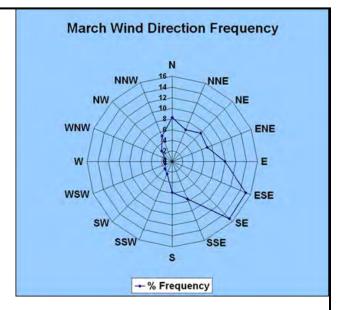
Source: US Department of Commerce, National Oceanic & Atmospheric Administration, National Weather Service, Key West, FL

FIGURE 3.6

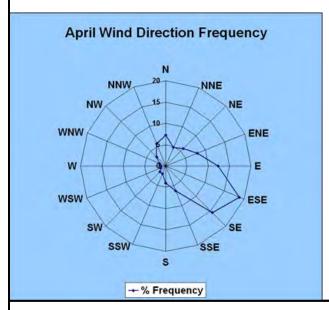
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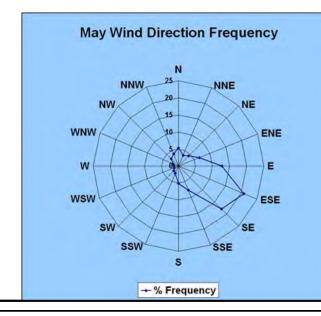


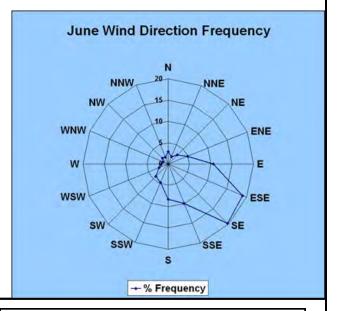




Source: US Department of Commerce, National Oceanic & Atmospheric Administration, National Weather Service, Key West, FL





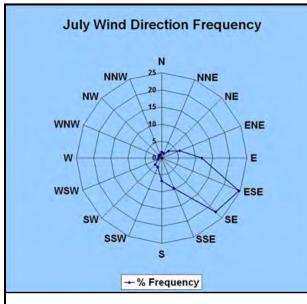


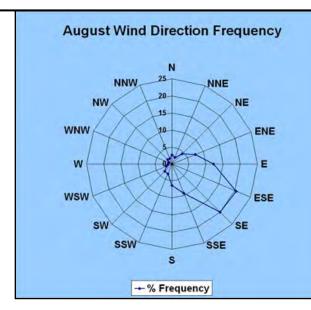
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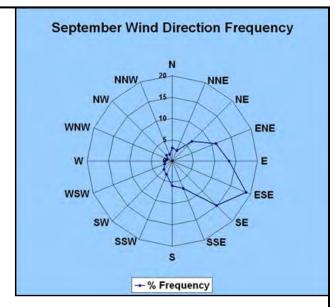
MONTHLY WIND DIRECTION FREQUENCY
JANUARY — JUNE



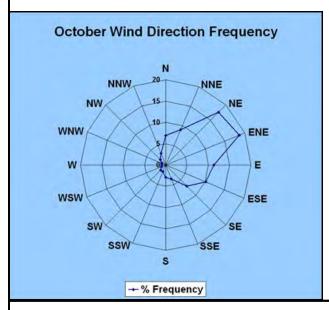
INTERNATIONAL AIRPORT
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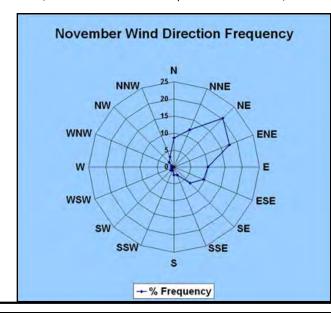


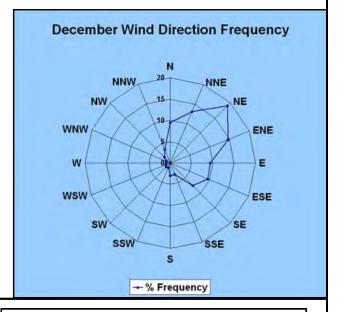




Source: US Department of Commerce, National Oceanic & Atmospheric Administration, National Weather Service, Key West, FL







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MONTHLY WIND DIRECTION FREQUENCY JULY — DECEMBER



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