WRI
WEATHER ROUTING INC.

Introduction: Please find a climatology study below for weather conditions from Tahiti to Costa Rica in September/October.

Synopsis of Weather Features:

Near Tahiti, trade winds are the primary driver of conditions, due in part to the existence of a semi-permanent ridge of high pressure in place farther south. During September to October, the axis of the ridge can be found over the South-Central Pacific between 30S and 35S and from 170W to 120W, with ridging extending as far north as 10S. The ridging will fluctuate slightly to the north when cold fronts pass well to the south. However, these cold fronts will tend to be weaker than their winter counterparts, and continue to weaken, while passing farther south as the month progresses. Trade winds and associated combined seas will be dominant from the Society Islands N'ward to approximately 10S and "lulls" in these trade regimes become less frequent through the month. There is little weakening of the ridge through the end of October.

The Equatorial Trough (an elongated west to east oriented low-pressure trough), between approximately 02S and 12N, extending from the E'rn Pacific W'ward to the International Dateline; produces widespread showers and squalls track in a general W'ward motion. Expect localized enhanced winds and seas within these showers and squalls.

Outside of tropical activity, squalls are frequent from Panama to/at Los Sueños. These squalls bring heavy rains and brief gusty winds as they move through. A thermal trough of low pressure, normally found along or very near the west coast of NW'rn Colombia, extends WNW'ward across the Gulf of Panama and across SE'rn Costa Rica. Slight E'ward/W'ward shifts in location and only slight changes in strength of the trough can be expected over a given time period.

Ridges of high pressure occasionally extend from the Central/W'rn Caribbean W'ward towards Nicaragua and Honduras. When this occurs, NE'ly wind surges are possible abeam gulfs, such as the Gulf of Nicoya.

Tropics:

During the months of September and October, tropical development is nil in the S'rn Hemisphere from Tahiti to the Equator. Further north, the Pacific Tropical Season runs from May 15th through November 30th. Tropical systems are most frequent across the E'rn and Central Pacific between July and September, with developing cyclones becoming more infrequent from late September into October. These cyclones take one of a few trajectories; the first is a more W-WNW'ward heading across the E'rn and Central Pacific along the S'rn periphery of the Central Pacific ridge. The second is

a more NNW'ward heading closer toward the Gulf of Tehuantepec and west of the Mexican Riviera toward Baja California.

Routing

Recommended Route: Direct departure to Los Sueños through French Polynesian Islands.

Pros

- Winds Beaufort Force 4 or less 77% of the time.
- Seas 2.0 meters or less nearly 95% of the time.
- It's the shortest option, at 4208 NM.
- Winds beam to following 45% of the time.
- Keeps the vessel southeast of most tropical tracks in the Eastern Pacific.

Cons

- We'll have to monitor the potential for isolated to scattered showers/squalls associated with the Equatorial Trough for localized higher conditions.
- There's an overall negative current factor of -0.28 knots due to the Equatorial Current.
- Winds Beaufort Force 5 or stronger 23% of the time.
- Head/quarter to head conditions 55% of the time.

Alternate Route: Departure to Balboa in March through French Polynesian Islands, RL – 04S/140W, then direct to Los Sueños

Pros

- Winds Beaufort Force 4 or less 83% of the time.
- Seas 2.0 meters or less 98% of the time.
- Winds beam to following 65% of the time.

Cons

- We'll have to monitor the potential for isolated to scattered showers/squalls associated with the Equatorial Trough for localized higher conditions.
- There's an overall negative current factor of -0.20 knots due to the Equatorial Current.

- Winds Beaufort Force 5 or stronger 17% of the time.
- It's longer, at 4425 NM.
- Head conditions 35% of the time.

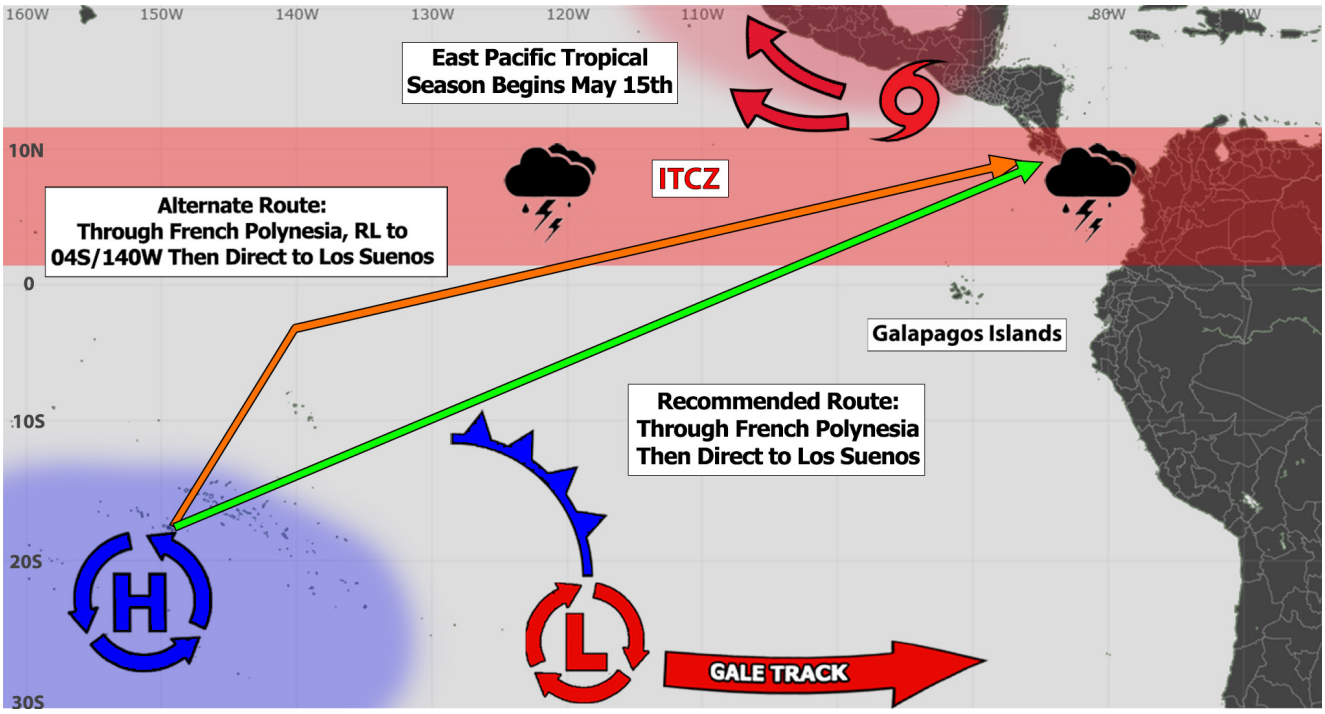


Figure 1: Weather features across the Central/Southern Pacific during the months of September/October with WRI's recommended route in green, and alternate route in orange.

Conclusions:

Per your request we've noted that you're looking for the best window to make a transit from Tahiti (Papeete) to Costa Rica/Panama between July and November. **Late September/October is the best time to make this transit for a number of reasons.** For the purpose of this analysis, we've based the report off Costa Rica, though please let us know your clear intentions once known. The main reason that this time of year is best to make this type of transit is that the vessel will be taking advantage of the winter to spring transition across the S'rn Hemisphere, which leads to an overall weakening of the ridge/gale/cold frontal pattern across Tahiti. Although there may be the potential for necessary delays to best time departure between cold frontal passages/larger swell fronts, this time of year allows for more frequent and longer weather windows. This window also allows the vessel to depart ahead of the beginning of the South Pacific Cyclone Season, which begins on November 01st.

The recommended route will be a simple direct approach to Los Sueños proceeding, as safe

navigation permits, through the French Polynesian Atolls. This departure is the shortest available and will result in a generally favorable wind/swell regime climatologically. There are several factors we will have to monitor closely. The first being the Intertropical Convergence Zone (ITCZ), which is responsible for generating scattered showers/squalls between about 02N to 10N. The Equatorial Current will also be a factor we will have to monitor, which may lead to necessary routing adjustments to minimize periods of strong adverse currents between those latitudes. Finally, periods of enhanced ESE'ly winds, due to the trade wind regime, will have to be watched closely.

If, by the time of departure the ESE'ly wind regime proves to be strong and stagnant, we've proposed an alternative option for routing. A more NE'rn heading, to near 04S/140W, once clear of the Polynesian Atolls will assist in both minimizing the time spent within these stronger conditions, and improve the angle allowing for a more beam wind rather than head wind. The obvious disadvantage of this option is that it's significantly longer by about 225 NM, though this specific waypoint can be adjusted in route to minimize distance if able/necessary.

We trust this information assists. Please let us know if you have any questions. Thanks.

Weather Routing Inc. (WRI)'s Climate Derived Voyage Report

Voyage Details

Departure	**PAPEETE**	Climatological Month	**September**	Route Description	**Direct through French Polynesia**
Destination	**LOS SUENOS**	Intended Speed (kts)	**10.0**		

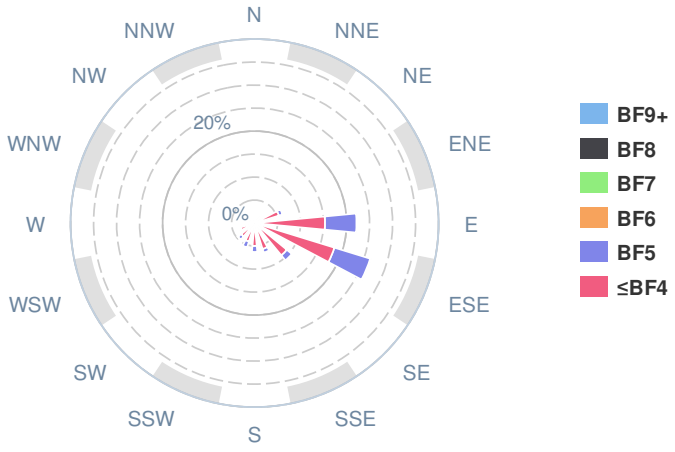
Monthly Climatological Calculations

Total Distance (nm)	4,208.5	Distance in ECA (nm)	0.0
Avg Weather Factor (kts)	-0.10	Wind Speed Constraint (kts)	30
Avg Current Factor (kts)	-0.28	Wave Height Constraint (m)	2.5
Avg Speed (kts)	9.6		
Avg Cruising Hours	437.5		

% Frequency Winds/Seas

<BF4	77.3%	<2m	94.6%
BF5	22.3%	3m	5.4%
BF6	0.5%	4m	0%
BF7	0%	5m	0%
BF8+	0%	6m+	0%

Climatology of Wind Direction and Speed Frequency



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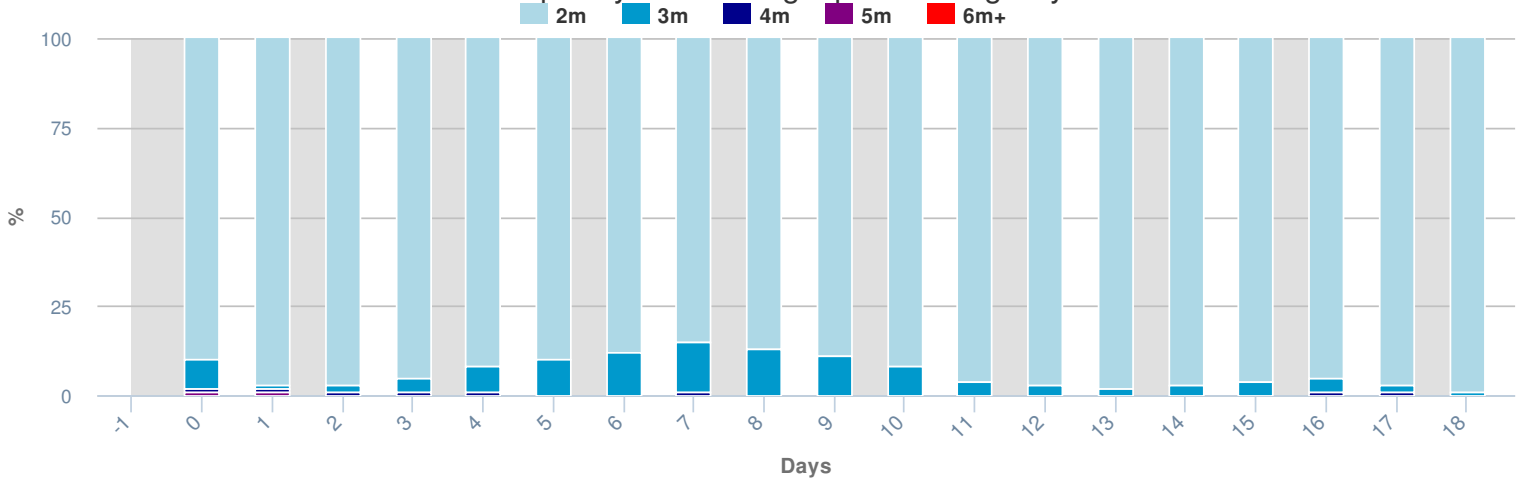
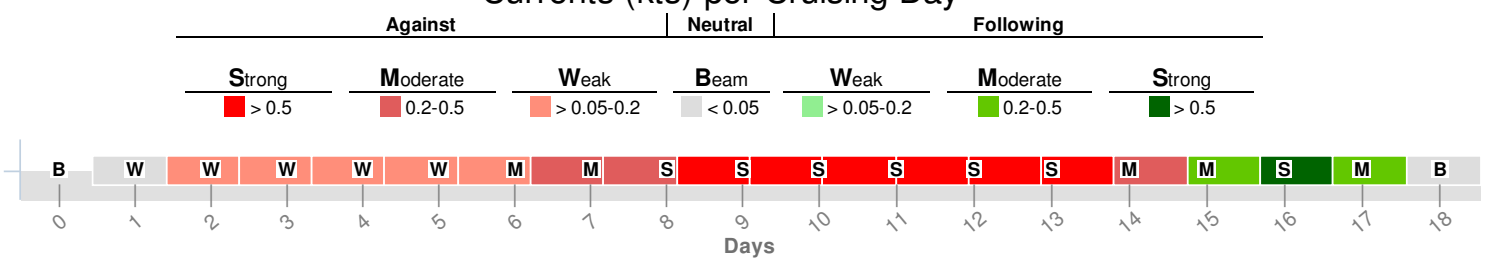
	<=BF 4	BF 5	BF 6	BF 7	BF 8	BF 9+
N	0.54%	0.02%	0%	0%	0%	0%
NNE	0.78%	0.03%	0%	0%	0%	0%
NE	1.77%	0.1%	0%	0%	0%	0%
ENE	5.5%	0.83%	0.01%	0%	0%	0%
E	15.3%	6.85%	0.1%	0%	0%	0%
ESE	18.14%	8.15%	0.23%	0%	0%	0%
SE	9.08%	1.43%	0.09%	0.01%	0%	0%
SSE	5.88%	0.84%	0.01%	0%	0%	0%
S	4.95%	1.32%	0%	0%	0%	0%
SSW	4.17%	1.35%	0.01%	0%	0%	0%
SW	3.74%	0.9%	0%	0%	0%	0%
WSW	3.17%	0.36%	0%	0%	0%	0%
W	2.01%	0.09%	0%	0%	0%	0%
WNW	1.04%	0.02%	0%	0%	0%	0%
NW	0.68%	0.01%	0%	0%	0%	0%
NNW	0.47%	0.02%	0%	0%	0%	0%

% Frequency of Sea Height per Cruising Day



Currents (kts) per Cruising Day



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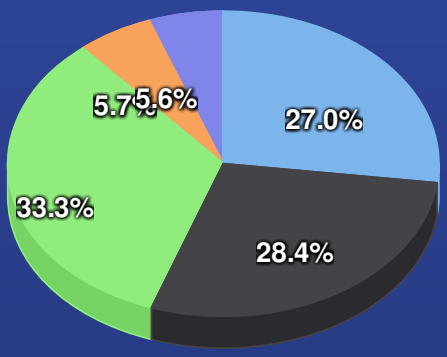
Destination	**LOS SUENOS**	Intended Speed (kts)	**10.0**		

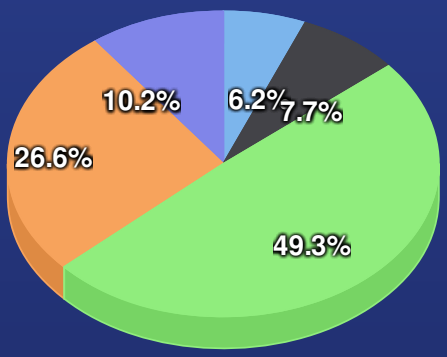
% Duration of Winds (Beaufort Force) Direction Relative to Vessel

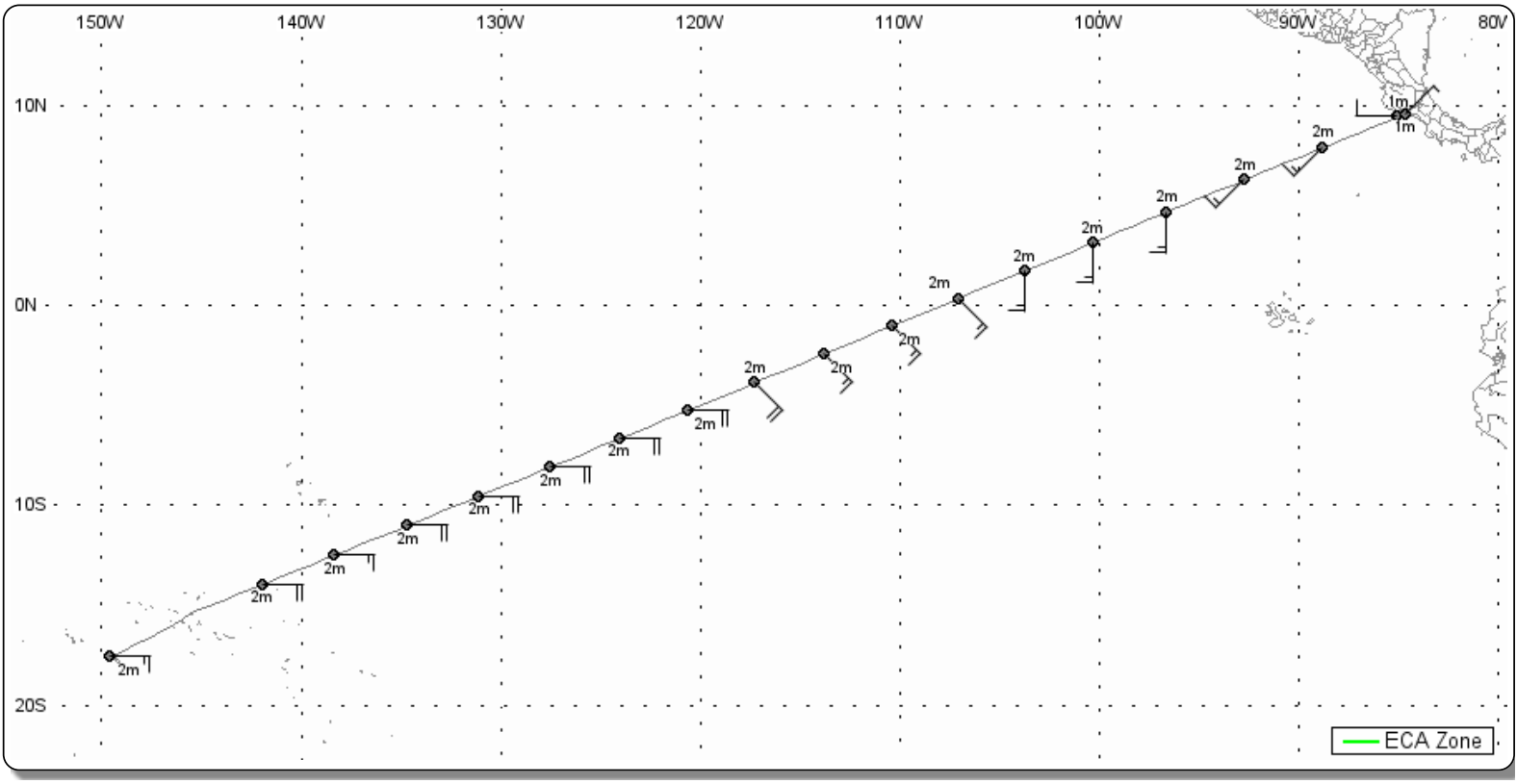
	<=1	2	3	4	5	6	7	8	9	10=>	Total
Head	0.2	0.9	4.5	14.3	7.1	0.1					27
Head Qtr	0.2	0.9	4.4	14.7	8.2	0.1					28.4
Beam	0.6	2.1	7.3	17.4	5.7	0.3					33.3
Aft Qtr	0.1	0.6	1.5	2.5	0.9						5.7
Follow	0.1	0.7	2	2.4	0.5						5.6
Total	1.2	5.2	19.6	51.3	22.3	0.5					100



% Duration of Sea Heights (meters) Direction Relative to Vessel

	<=1	2	3	4	5	6	7	8	9	10=>	Total
Head	2.3	3.8	0.2								6.2
Head Qtr	0.7	6	0.9								7.7
Beam	6.8	39.5	3								49.3
Aft Qtr	4.6	21	0.9								26.6
Follow	1.1	8.8	0.4								10.2
Total	15.5	79.1	5.4								100





Wind barbs on map represent the maximum wind speed for that point during the climatological month

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Destination	**LOS SUENOS**	Intended Speed (kts)	**10.0**		

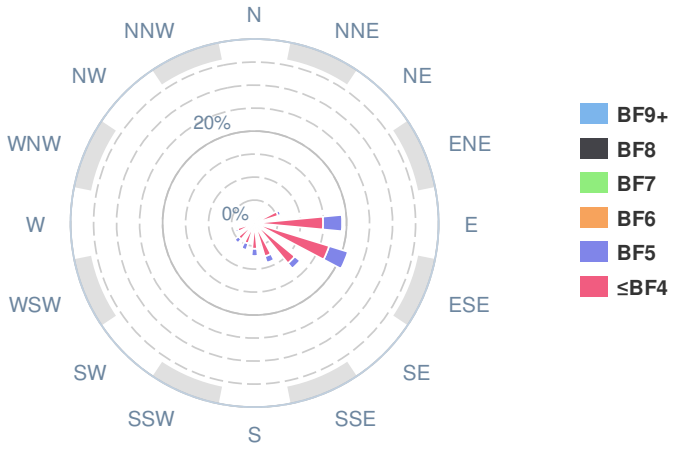
Monthly Climatological Calculations

Total Distance (nm)	4,425.2	Distance in ECA (nm)	0.0
Avg Weather Factor (kts)	-0.06	Wind Speed Constraint (kts)	30
Avg Current Factor (kts)	-0.20	Wave Height Constraint (m)	2.5
Avg Speed (kts)	9.7		
Avg Cruising Hours	454.4		

% Frequency Winds/Seas

<BF4	82.7%	<2m	97.9%
BF5	17%	3m	2%
BF6	0.3%	4m	0%
BF7	0%	5m	0%
BF8+	0%	6m+	0%

Climatology of Wind Direction and Speed Frequency



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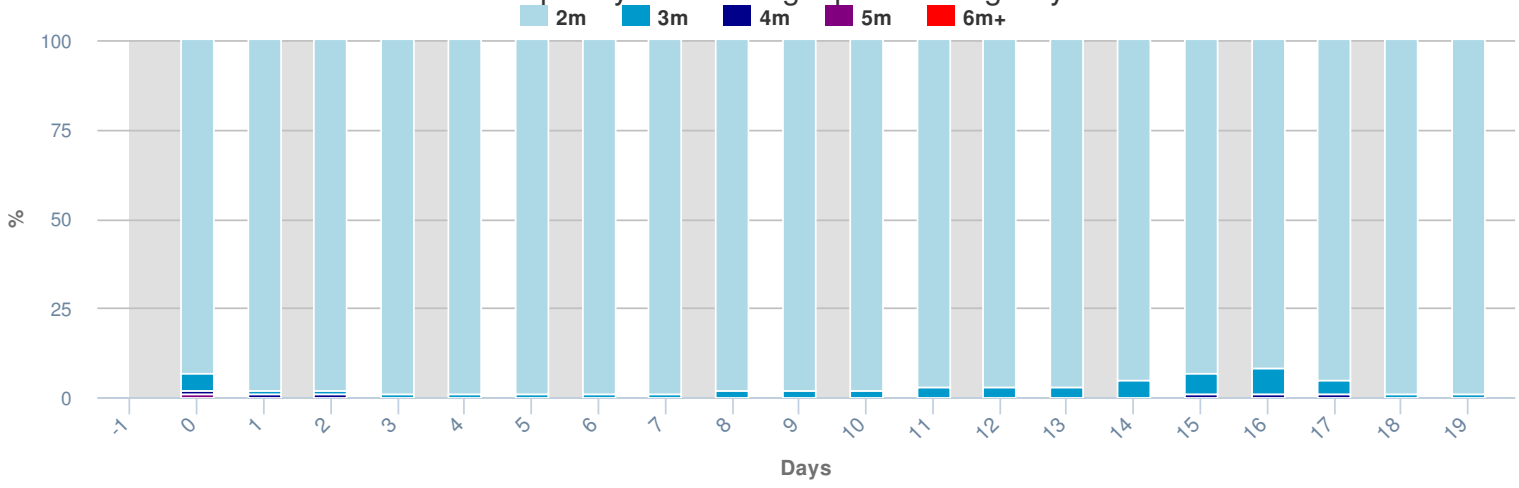
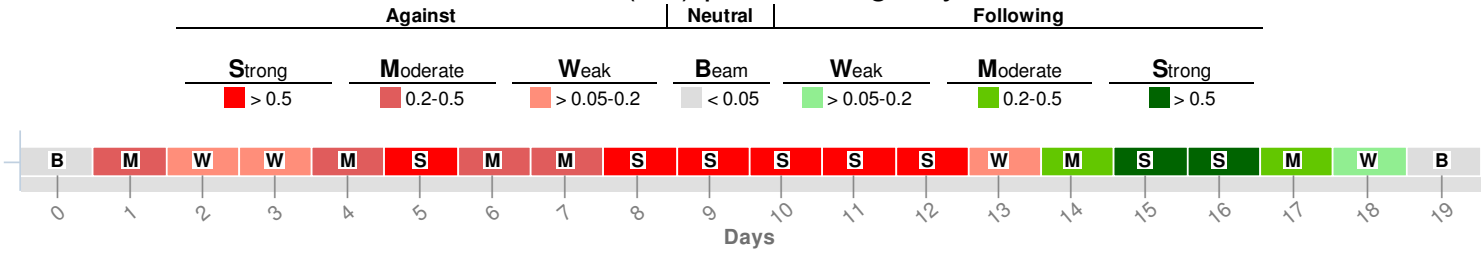
	<=BF 4	BF 5	BF 6	BF 7	BF 8	BF 9+
N	0.59%	0.01%	0%	0%	0%	0%
NNE	0.79%	0.02%	0%	0%	0%	0%
NE	1.74%	0.09%	0%	0%	0%	0%
ENE	5.3%	0.66%	0%	0%	0%	0%
E	14.87%	4.16%	0.05%	0%	0%	0%
ESE	16.94%	4.29%	0.18%	0%	0%	0%
SE	11.33%	1.5%	0.07%	0.01%	0%	0%
SSE	7.55%	1.46%	0%	0%	0%	0%
S	5.56%	1.59%	0%	0%	0%	0%
SSW	4.65%	1.47%	0.01%	0%	0%	0%
SW	4.54%	1.09%	0.01%	0%	0%	0%
WSW	3.85%	0.53%	0.01%	0%	0%	0%
W	2.38%	0.12%	0%	0%	0%	0%
WNW	1.2%	0.02%	0%	0%	0%	0%
NW	0.81%	0.01%	0%	0%	0%	0%
NNW	0.54%	0.01%	0%	0%	0%	0%

% Frequency of Sea Height per Cruising Day



Currents (kts) per Cruising Day



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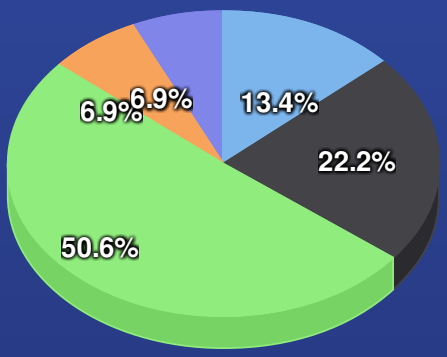
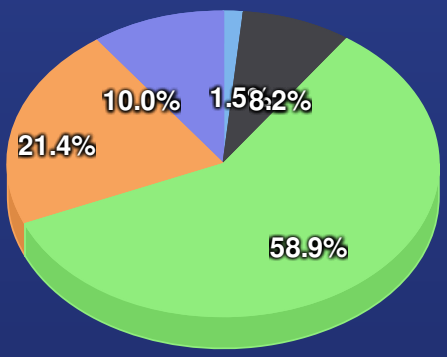
% Duration of Winds (Beaufort Force) Direction Relative to Vessel

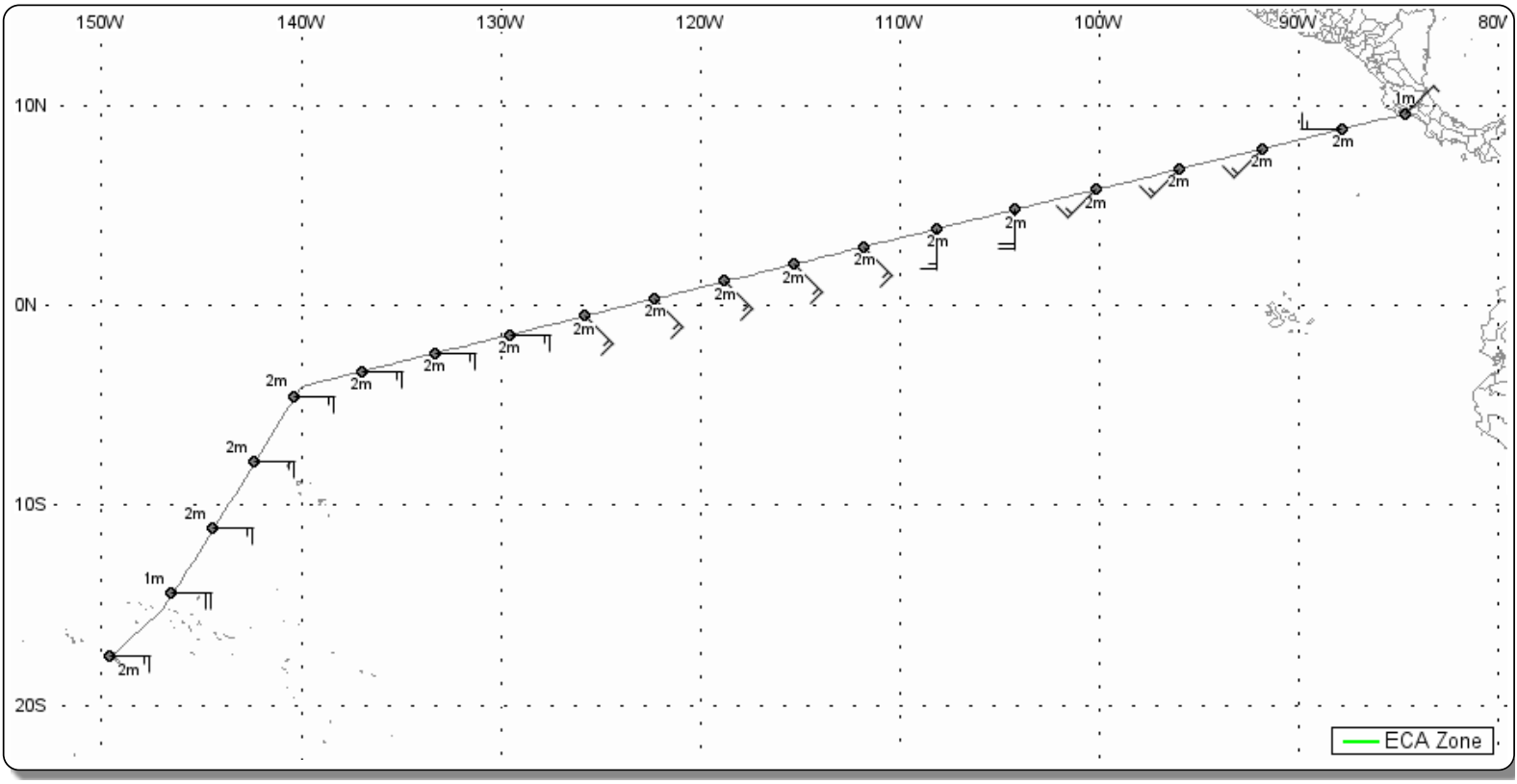
	<=1	2	3	4	5	6	7	8	9	10=>	Total
Head	0.2	0.7	3.1	7.5	1.9						13.4
Head Qtr	0.2	0.8	4.8	13.1	3.3						22.2
Beam	0.7	2.5	9.4	27.7	10.1	0.3					50.7
Aft Qtr	0.2	0.8	1.8	3	1.1						6.9
Follow	0.2	1	2.3	2.8	0.6						6.9
Total	1.4	5.8	21.3	54.2	17	0.3					100



% Duration of Sea Heights (meters) Direction Relative to Vessel

	<=1	2	3	4	5	6	7	8	9	10=>	Total
Head	0.5	1									1.5
Head Qtr	1.3	6.8	0.1								8.2
Beam	10.4	47.2	1.2								58.8
Aft Qtr	3.8	17.2	0.5								21.4
Follow	1.5	8.3	0.3								10
Total	17.5	80.4	2								100





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