Appendix B

- Climatological Data
- Meteorological Data
- Atmospheric Pressure Conversion
- Mean Surface Water Temperatures and Densities
- Table for Estimating Time of Transit
- Determination of Wind Speed by Sea Condition
- Distances Between Ports
- Distances of Visibility for Objects Having Various Elevations
- Conversion of Degrees to Points
- Standard Abbreviations Used in Broadcasts
- Conversion Factors
- Measurements and Equivalencies
- Tips for Boating Clean and Green

CLIMATOLOGICAL DATA – NEW YORK (KENNEDY AIRPORT), NY (40°39'N, 73°47'W) 13 feet (4 m)														
WEATHER ELEMENTS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	YEARS OF RECORD
SEA LEVEL PRESSURE (station pressure reduced to sea level)														
Mean (millibars)	1018.0	1017.4	1015.9	1015.1	1015.8	1014.9	1015.7	1016.6	1018.5	1018.9	1017.9	1018.5	1016.9	48
TEMPERATURE (°F)														
Mean	32.5	33.5	41.2	50.8	60.6	70.0	76.0	75.0	67.8	57.2	47.5	37.5	54.2	34
Mean daily maximum	38.6	39.9	48.1	58.3	68.1	77.4	83.1	82.1	75.0	64.5	54.0	43.5	61.1	34
Mean daily minimum	26.0	26.6	33.8	42.8	52.5	62.1	68.5	67.5	60.1	49.5	40.6	31.1	46.8	34
Extreme (highest)	69	68	85	90	99	99	104	101	98	85	77	70	104	34
Extreme (lowest)	-2	0	7	20	34	45	55	46	41	30	19	2	-2	34
RELATIVE HUMIDITY														
Average percentage	54.7	48.7	33.8	26.1	32.5	23.9	31.7	41.0	59.6	63.5	54.0	60.4	44.2	47
CLOUD COVER														
Percent of time clear	23.6	24.7	23.7	22.3	18.4	18.2	17.5	19.2	24.4	29.3	22.8	22.9	22.2	48
Percent of time scattered	16.1	16.6	16.3	16.7	18.8	21.7	25.0	24.7	21.2	19.9	17.9	17.3	19.3	48
Percent of time broken	14.2	14.5	16.0	17.5	20.0	22.3	23.8	22.7	20.1	17.1	16.7	14.7	18.3	48
Percent of time overcast	42.0	40.5	40.2	38.9	37.7	32.3	27.9	28.1	29.6	29.1	37.9	41.2	35.5	48
PRECIPITATION (inches)														
Mean amount	3.2	2.8	3.5	3.6	3.9	3.0	3.7	3.5	3.3	2.8	3.4	3.5	40.8	34
Greatest amount	8.3	4.8	8.1	9.5	10.7	8.0	8.4	8.3	9.6	6.5	9.5	6.7	59.1	34
Least amount	0.4	1.0	0.9	1.3	0.6	T	0.5	0.2	0.9	0.9	0.3	0.6	25.3	34
Maximum amount (24 hours)	2.5	2.4	2.4	3.1	2.8	2.8	3.2	3.7	4.4	3.2	3.9	2.5	4.4	34
Mean number of days	15	13	16	16	15	14	13	13	12	11	14	16	168	34
SNOW														
Mean amount	6.7	8.0	3.4	0.5	0.0	0.0	0.0	0.0	0.0	T	0.4	3.4	22.4	34
Greatest amount	20.1	24.7	15.5	8.2	0.0	0.0	0.0	0.0	0.0	T	3.7	22.4	48.9	34
Least amount	T	T	T	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	T	1.3	34
Maximum amount (24 hours)	13.0	19.9	9.0	8.0	0.0	0.0	0.0	0.0	0.0	T	3.2	18.0	19.9	34
Mean number of days	8	8	5	1	0	0	0	0	0	Miss	2	6	30	34
WIND														
Percentage with gales	0.06	0.11	0.05	0.08	0.01	0.03	0.00	0.02	0.04	0.02	0.10	0.10	0.18	48
Mean wind speed (knots)	11.4	11.5	11.8	11.2	9.9	9.4	8.9	8.7	9.0	9.5	10.6	11.0	10.2	48
Direction (percentage of observations)														
North	7.3	7.6	7.3	6.3	5.4	4.9	5.0	5.9	6.7	7.2	6.2	7.1	6.4	48
North Northeast	5.3	6.6	6.0	5.2	4.8	4.3	4.1	5.9	6.9	7.6	5.9	6.2	5.7	48
Northeast	5.4	5.6	5.5	4.7	5.3	3.9	4.0	5.3	7.3	7.2	5.4	6.3	5.5	48
East Northeast	4.2	4.9	5.4	4.6	4.7	3.6	3.2	4.3	6.5	5.3	4.9	4.7	4.7	48
East	2.8	3.7	4.1	4.7	4.8	3.9	2.9	2.9	4.0	3.6	3.2	2.6	3.6	48
East Southeast	1.4	1.9	3.2	4.1	4.9	3.8	3.1	2.7	3.1	2.4	2.2	1.1	2.8	48
Southeast	1.1	1.7	2.5	3.7	4.6	4.0	3.2	4.9	2.7	2.4	2.0	1.3	2.7	48
South Southeast	1.3	2.4	3.7	5.2	6.6	5.9	6.2	10.4	4.9	3.1	2.5	1.5	4.1	48
South	4.5	5.4	8.5	12.4	14.8	17.6	16.7	14.3	10.4	7.9	6.7	4.0	10.3	48
South Southwest	5.0	5.3	5.9	7.6	9.8	13.5	14.4	12.8	9.5	7.7	6.0	4.7	8.5	48
Southwest	5.9	5.5	4.1	5.2	6.3	8.0	10.0	10.3	7.9	7.9	7.2	6.7	7.1	48
West Southwest	9.7	7.9	5.6	5.9	6.1	7.2	8.7	8.5	7.3	8.4	10.0	10.6	8.0	48
West	10.8	8.3	6.1	5.4	4.4	4.4	4.8	5.1	5.2	6.6	9.1	10.5	6.7	48
West Northwest	12.5	10.2	9.1	6.7	4.1	3.9	3.8	3.6	4.4	6.8	9.8	11.6	7.2	48
Northwest	13.3	12.6	12.7	9.5	5.8	4.9	4.1	4.3	5.4	7.6	10.1	12.2	8.5	48
North Northwest	8.4	9.4	8.9	7.2	5.8	4.9	4.5	4.3	6.1	6.6	7.6	8.3	6.8	48
Calm	1.3	0.9	1.1	1.3	1.8	1.2	1.5	1.7	1.4	1.7	1.3	1.0	1.4	48
Direction (mean speed, knots)														
North	10.4	10.9	11.2	10.9	10.0	9.4	8.4	8.6	9.3	9.3	9.4	10.3	9.9	48
North Northeast	10.3	10.2	11.5	11.2	10.0	9.6	8.4	8.9	9.2	9.3	9.6	9.9	9.8	48
Northeast	10.0	10.6	11.2	11.0	9.8	9.0	7.7	8.2	8.4	9.3	9.3	9.6	9.5	48
East Northeast	8.6	9.6	10.8	10.0	8.9	7.7	6.9	7.0	8.0	8.4	8.5	8.4	8.6	48
East	7.8	8.9	10.0	9.3	8.4	7.4	6.5	7.1	7.3	8.0	8.6	8.1	8.2	48
East Southeast	7.8	8.6	9.6	9.7	8.5	8.2	7.1	7.7	8.0	8.6	9.4	10.0	8.6	48
Southeast	9.3	9.7	10.2	9.7	9.2	9.3	9.2	8.8	9.1	9.3	10.5	9.9	9.4	48
South Southeast	10.7	10.2	10.5	10.7	10.1	9.5	9.7	9.4	9.7	9.3	10.2	11.6	10.0	48
South	9.7	9.2	10.9	11.3	10.9	10.4	10.2	9.9	10.0	9.2	10.3	9.7	10.3	48
South Southwest	10.0	9.8	9.9	10.6	9.9	9.6	9.7	9.4	9.4	9.3	9.5	9.8	9.7	48
Southwest	9.5	9.6	10.0	9.4	9.3	8.6	8.4	8.2	8.9	9.0	9.5	9.7	9.1	48
West Southwest	10.4	10.6	11.5	10.7	9.3	8.7	8.2	8.4	8.4	9.2	10.3	10.0	9.6	48
West	13.1	13.0	13.1	12.6	10.2	8.7	8.3	8.3	9.1	10.1	11.7	11.8	11.2	48
West Northwest	14.0	14.4	15.1	13.9	12.3	11.2	10.3	9.4	10.2	11.6	13.0	13.6	13.0	48
Northwest	14.3	14.8	14.6	14.1	12.7	11.9	10.4	10.3	11.0	12.1	13.2	13.6	13.3	48
North Northwest	12.1	13.0	12.8	12.5	11.5	11.3	9.7	9.8	10.5	10.7	11.7	11.9	11.7	48
VISIBILITY														
Mean number of days with fog	10	9	11	11	13	12	13	12	11	10	11	10	133	34

T = trace (not measurable) amount of precipitation
Miss or blank is a missing value

These tables were prepared by the National Climatic Data Center (NCDC), National Environmental Satellite, Data & Information Service (NESDIS), NOAA

CLIMATOLOGICAL DATA – NEWARK, NJ (40°42'N, 74°10'W) 26 feet (8 m)														
WEATHER ELEMENTS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**YEAR**	**YEARS OF RECORD**
SEA LEVEL PRESSURE (station pressure reduced to sea level)														
Mean (millibars)	1018.3	1017.9	1016.1	1015.1	1015.6	1015.0	1015.5	1016.5	1018.5	1019.1	1018.0	1018.9	1017.0	48
TEMPERATURE (°F)														
Mean	31.6	33.3	41.6	52.2	62.8	72.0	77.2	75.6	68.0	57.3	46.7	35.7	54.7	61
Mean daily maximum	38.5	40.7	49.7	61.3	72.1	81.1	86.0	84.1	76.7	66.2	54.3	42.5	63.0	61
Mean daily minimum	24.2	25.4	33.1	42.7	52.9	62.3	68.0	66.5	58.8	47.9	38.6	28.4	45.9	61
Extreme (highest)	74	76	89	94	98	102	105	103	105	93	85	72	105	61
Extreme (lowest)	-8	-7	6	16	33	41	52	45	35	25	15	-1	-8	61
RELATIVE HUMIDITY														
Average percentage	57.8	54.0	35.9	26.2	31.0	24.8	30.0	39.7	59.8	65.7	54.9	64.5	45.2	48
CLOUD COVER														
Percent of time clear	24.1	24.2	23.8	21.3	18.3	18.5	18.5	20.1	23.5	29.8	24.1	22.9	22.4	48
Percent of time scattered	16.5	17.5	18.1	18.9	21.2	25.5	25.9	26.8	23.3	21.2	18.5	17.3	20.9	48
Percent of time broken	14.6	14.5	15.5	18.4	20.1	22.0	24.4	22.7	20.1	17.2	16.9	14.8	18.5	48
Percent of time overcast	44.8	43.7	42.7	41.4	40.3	33.9	31.2	30.4	33.1	31.8	40.5	45.1	38.2	48
PRECIPITATION (inches)														
Mean amount	3.4	2.9	4.0	3.6	3.8	3.2	4.2	4.1	3.6	3.0	3.7	3.4	43.4	61
Greatest amount	10.1	5.8	11.4	11.1	10.2	6.4	9.9	11.8	10.2	8.2	11.5	9.4	65.5	61
Least amount	0.4	0.7	1.1	0.9	0.5	0.0	0.8	0.3	0.1	0.2	0.5	0.2	26.0	61
Maximum amount (24 hours)	2.9	2.3	2.7	2.8	3.9	2.9	3.5	5.9	4.7	3.9	6.7	2.7	6.7	61
Mean number of days	16	14	16	16	16	15	14	13	12	12	14	16	174	61
SNOW														
Mean amount	8.9	9.2	3.7	0.7	T	0.0	0.0	0.0	0.0	T	0.6	3.9	27.0	61
Greatest amount	31.6	33.4	26.0	13.8	T	0.0	0.0	0.0	0.0	0.3	5.7	29.1	33.4	61
Least amount	0.1	T	T	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0	1.9	61
Maximum amount (24 hours)	27.4	20.0	17.6	12.8	T	0.0	0.0	0.0	0.0	0.3	5.7	25.9	27.4	61
Mean number of days	11	9	7	1	Miss	0	0	0	0	Miss	2	7	37	61
WIND														
Percentage with gales	0.01	0.02	0.01	0.03	0.01	0.01	0.00	0.03	0.03	0.03	0.04	0.03	0.02	48
Mean wind speed (knots)	9.7	9.9	10.3	9.7	8.8	8.3	7.8	7.6	7.9	8.3	8.9	9.4	8.9	48
Direction (percentage of observations)														
North	5.8	6.4	6.5	5.5	5.0	4.4	5.0	5.4	7.1	6.2	5.8	6.0	5.8	48
North Northeast	9.3	8.8	8.4	6.5	6.4	5.8	5.6	7.6	10.1	10.6	9.1	9.9	8.2	48
Northeast	5.6	6.7	6.1	5.4	6.1	4.4	4.0	5.0	5.9	6.2	4.6	5.3	5.4	48
East Northeast	2.5	3.3	4.5	4.1	3.9	2.6	2.5	2.5	3.4	3.5	2.7	2.3	3.2	48
East	1.7	2.4	3.4	4.1	4.4	3.4	2.3	2.5	2.9	2.5	2.5	1.6	2.8	48
East Southeast	1.3	2.2	3.9	5.7	6.6	5.3	3.3	3.1	3.6	3.0	2.5	1.2	3.5	48
Southeast	1.1	1.8	3.7	5.5	6.9	6.4	5.5	4.9	4.3	3.5	2.5	1.3	4.0	48
South Southeast	1.7	2.2	3.5	4.5	5.8	6.2	6.8	5.8	4.7	3.5	2.5	2.0	4.1	48
South	3.3	3.9	4.1	4.8	5.6	6.8	7.9	7.7	5.9	4.6	4.6	3.6	5.2	48
South Southwest	5.7	5.3	4.8	6.3	7.7	8.9	9.3	9.0	8.2	8.5	7.4	6.1	7.3	48
Southwest	9.8	7.7	6.1	8.3	10.3	13.1	13.0	13.6	12.1	11.8	11.8	10.7	10.7	48
West Southwest	11.5	9.1	7.0	7.1	7.5	8.9	10.3	9.3	7.7	9.0	9.6	10.5	9.0	48
West	9.7	8.1	6.6	5.9	4.7	5.8	6.6	6.2	6.1	6.7	8.6	9.7	7.0	48
West Northwest	11.5	10.6	10.5	8.6	5.7	6.0	6.4	5.8	5.6	6.3	9.1	11.2	8.1	48
Northwest	11.1	12.5	12.2	9.7	6.7	6.1	6.0	5.2	6.1	6.7	9.2	10.4	8.5	48
North Northwest	6.7	7.3	8.0	6.7	5.3	4.6	4.2	4.7	4.9	5.7	5.5	6.5	5.8	48
Calm	1.9	1.9	1.1	1.2	1.5	1.4	1.7	1.7	1.7	2.0	2.2	1.8	1.7	48
Direction (mean speed, knots)														
North	9.2	10.1	10.5	9.9	8.8	8.6	7.7	7.8	8.4	8.5	8.5	9.0	9.0	48
North Northeast	9.5	9.6	9.7	9.6	9.4	8.9	7.7	8.3	8.6	8.9	8.8	9.0	9.0	48
Northeast	9.3	9.3	9.8	9.9	9.1	8.4	7.6	8.0	8.6	8.6	8.4	8.9	8.9	48
East Northeast	7.8	8.4	9.1	9.0	8.1	7.9	6.9	7.0	7.8	8.5	7.9	8.2	8.2	48
East	5.4	6.2	7.3	6.9	6.3	6.3	5.7	5.9	6.2	6.8	6.9	5.7	6.4	48
East Southeast	6.3	6.8	8.1	8.2	7.4	7.1	6.8	6.7	7.4	7.6	7.9	7.6	7.4	48
Southeast	6.9	7.1	8.1	8.4	8.0	7.9	7.7	7.7	7.8	7.5	7.6	6.9	7.8	48
South Southeast	6.4	7.3	7.7	7.7	7.7	7.5	7.6	7.8	7.6	6.9	7.1	7.4	7.5	48
South	5.9	6.3	6.9	7.1	7.2	7.1	7.1	7.1	6.9	6.4	6.7	6.0	6.8	48
South Southwest	7.3	7.7	8.1	8.6	8.1	7.9	7.6	7.4	7.3	7.1	7.4	7.5	7.6	48
Southwest	8.3	8.7	9.6	9.2	8.7	8.4	7.8	7.5	7.4	7.7	8.0	8.0	8.2	48
West Southwest	9.7	9.6	10.3	9.9	9.5	8.6	8.1	7.7	7.7	8.2	9.1	8.8	8.9	48
West	10.1	10.3	10.9	10.3	9.3	8.3	7.8	6.9	7.6	8.2	9.4	9.7	9.2	48
West Northwest	12.2	12.5	13.0	12.3	10.7	9.6	9.1	8.7	8.8	10.1	11.6	12.0	11.2	48
Northwest	13.0	13.5	13.8	13.5	11.9	11.1	9.9	9.6	10.2	11.1	12.4	12.9	12.3	48
North Northwest	12.0	12.3	12.1	12.2	11.1	10.6	9.5	9.2	9.9	10.7	11.1	11.5	11.2	48
VISIBILITY														
Mean number of days with fog	9	9	10	9	11	10	9	10	11	11	9	10	118	61

T = trace (not measurable) amount of precipitation
Miss or blank is a missing value

These tables were prepared by the National Climatic Data Center (NCDC), National Environmental Satellite, Data & Information Service (NESDIS), NOAA

CLIMATOLOGICAL DATA – ATLANTIC CITY, NJ (39°27'N, 74°34'W) 118 feet (36 m)														
WEATHER ELEMENTS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**YEAR**	**YEARS OF RECORD**
SEA LEVEL PRESSURE (station pressure reduced to sea level)														
Mean (millibars)	1018.3	1017.8	1016.3	1014.8	1015.9	1014.9	1015.6	1016.7	1018.2	1018.7	1018.7	1019.0	1017.1	38
TEMPERATURE (°F)														
Mean	31.7	33.6	41.4	51.0	60.7	69.8	75.3	73.7	66.6	55.5	46.1	36.1	53.7	40
Mean daily maximum	40.7	42.8	51.1	61.4	71.2	80.2	84.7	83.1	76.7	66.3	55.8	45.3	63.5	40
Mean daily minimum	22.3	23.9	31.2	40.0	49.6	59.0	65.3	63.7	56.1	44.3	35.9	26.5	43.3	40
Extreme (highest)	78	75	85	94	99	106	104	100	99	90	81	75	106	40
Extreme (lowest)	-10	-11	5	12	25	37	42	40	32	20	10	-2	-11	40
RELATIVE HUMIDITY														
Average percentage	58.5	52.9	37.8	22.8	34.2	23.9	30.5	41.8	57.4	62.1	61.6	65.4	45.8	40
CLOUD COVER														
Percent of time clear	25.0	24.9	26.0	22.6	18.6	17.3	16.8	18.4	24.4	30.3	24.3	25.5	22.8	37
Percent of time scattered	15.3	14.2	14.9	14.7	18.1	20.5	21.9	22.4	200	18.3	17.6	15.3	17.8	37
Percent of time broken	14.6	13.8	15.5	18.3	21.3	25.8	27.2	25.1	20.4	18.2	17.0	14.2	19.4	37
Percent of time overcast	40.7	43.2	39.1	38.6	36.0	30.2	27.6	27.9	29.9	28.7	35.6	40.5	34.7	37
PRECIPITATION (inches)														
Mean amount	3.3	2.9	3.9	3.3	3.2	2.5	4.3	4.6	3.0	2.9	3.3	3.3	40.9	40
Greatest amount	7.1	5.7	9.2	7.5	6.7	6.3	13.0	16.0	6.2	6.6	9.6	7.3	55.3	40
Least amount	0.5	0.8	0.7	0.8	0.5	0.6	0.5	0.4	0.4	0.1	0.6	0.6	25.2	40
Maximum amount (24 hours)	2.4	2.5	2.6	2.9	4.1	2.7	6.4	11.1	3.8	2.4	2.8	1.9	11.1	40
Mean number of days	14	13	15	14	15	12	13	12	11	10	13	15	157	40
SNOW														
Mean amount	5.3	5.9	2.1	0.4	T	0.0	0.0	0.0	0.0	T	0.4	2.3	16.5	38
Greatest amount	20.3	35.2	17.6	3.9	T	0.0	0.0	0.0	0.0	T	7.8	9.3	50.1	38
Least amount	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	38
Maximum amount (24 hours)	14.3	16.6	11.5	3.9	T	0.0	0.0	0.0	0.0	T	7.8	6.7	16.6	38
Mean number of days	7	7	4	1	Miss	0	0	0	0	Miss	1	5	25	40
WIND														
Percentage with gales	0.02	0.05	0.03	0.01	0.00	0.00	0.00	0.01	0.05	0.00	0.01	0.03	0.02	40
Mean wind speed (knots)	9.5	9.7	10.2	10.1	8.7	7.9	7.2	6.9	7.2	7.7	9.0	9.1	8.6	40
Direction (percentage of observations)														
North	6.2	6.3	5.5	4.6	4.4	4.0	4.2	5.7	7.5	7.5	5.7	6.9	5.7	40
North Northeast	3.7	3.8	3.5	2.9	3.3	2.5	2.7	3.9	5.0	4.5	3.7	4.1	3.6	40
Northeast	3.2	4.1	4.2	3.4	3.8	3.3	2.2	3.3	4.4	4.1	3.0	3.0	3.5	40
East Northeast	2.8	4.0	5.2	4.5	5.6	4.0	2.6	4.0	5.1	4.3	3.4	2.9	4.0	40
East	2.4	2.9	3.9	4.9	5.2	4.2	3.9	3.4	4.4	3.2	2.8	2.2	3.6	40
East Southeast	2.0	2.5	3.2	4.1	5.0	4.1	3.6	3.5	4.2	2.9	2.6	2.1	3.3	40
Southeast	1.7	2.4	3.4	3.8	4.2	3.4	4.2	3.3	3.4	3.1	2.4	1.6	3.1	40
South Southeast	2.3	2.9	4.0	5.6	6.0	6.7	6.1	5.4	4.2	3.5	3.2	2.1	4.3	40
South	4.4	5.1	7.4	9.8	10.7	13.3	12.8	10.8	7.6	6.0	6.6	4.4	8.3	40
South Southwest	5.6	5.9	6.4	7.6	9.0	11.1	11.1	10.3	7.9	6.3	6.9	6.3	7.9	40
Southwest	5.7	5.3	4.7	5.5	6.8	8.6	9.7	9.4	7.3	6.8	6.7	6.6	6.9	40
West Southwest	7.6	6.8	5.1	6.4	6.6	8.2	8.6	7.7	6.3	7.6	7.7	7.3	7.2	40
West	11.4	9.4	8.0	7.3	6.2	5.6	6.3	5.3	5.0	6.8	9.4	10.4	7.6	40
West Northwest	15.8	13.5	12.1	9.7	7.0	5.5	5.3	5.5	6.0	8.3	12.1	14.4	9.6	40
Northwest	12.1	12.1	11.1	9.4	6.7	6.3	5.5	6.0	6.8	8.8	11.3	11.9	9.0	40
North Northwest	7.3	8.0	7.9	6.7	5.0	4.4	4.9	4.8	6.8	7.0	6.5	7.5	6.4	40
Calm	5.8	5.1	4.2	3.6	4.4	4.9	6.3	7.9	8.0	9.3	5.9	6.4	6.0	40
Direction (mean speed, knots)														
North	8.1	8.9	9.1	9.2	7.8	7.5	6.9	6.8	7.2	7.8	8.2	8.0	8.0	40
North Northeast	7.9	8.9	9.2	9.1	7.9	6.7	6.6	6.9	7.4	8.3	7.9	7.8	7.9	40
Northeast	10.0	8.8	10.2	10.3	8.8	8.2	6.8	7.8	8.4	9.0	9.4	8.1	8.9	40
East Northeast	10.4	10.9	11.4	10.8	9.7	8.5	7.7	7.9	8.9	9.4	9.7	9.9	9.6	40
East	9.3	9.1	10.1	10.2	9.0	7.6	7.2	7.3	8.0	8.2	8.7	9.1	8.6	40
East Southeast	7.9	8.3	8.7	9.2	8.2	7.6	7.2	6.8	7.7	7.9	8.6	7.5	8.0	40
Southeast	7.9	7.6	9.0	8.8	8.3	7.4	7.3	7.0	7.7	8.0	8.4	7.3	7.9	40
South Southeast	9.2	8.9	9.0	9.7	9.0	8.3	8.0	7.7	8.2	8.2	9.4	8.4	8.6	40
South	9.9	9.3	10.6	10.8	10.4	9.2	8.9	8.6	8.5	8.8	9.7	9.2	9.5	40
South Southwest	9.1	9.6	10.3	10.6	9.4	8.6	8.3	8.1	8.3	8.4	9.4	9.4	9.0	40
Southwest	8.6	9.2	8.9	9.0	8.2	7.7	7.4	7.2	7.5	7.8	8.8	8.8	8.1	40
West Southwest	9.1	9.2	9.4	9.7	8.6	8.2	7.7	7.3	7.0	8.1	8.7	8.8	8.4	40
West	11.2	11.5	11.5	11.3	9.7	8.5	7.8	7.6	7.6	9.0	10.0	10.5	10.0	40
West Northwest	12.1	12.4	12.8	12.2	10.3	8.8	8.0	7.2	8.1	9.2	11.2	11.9	11.0	40
Northwest	11.2	11.9	12.2	11.5	9.3	8.2	7.1	6.7	7.2	8.6	10.5	11.1	10.1	40
North Northwest	9.3	10.1	10.1	10.1	8.8	8.0	6.9	6.7	7.3	8.2	8.9	9.4	8.8	40
VISIBILITY														
Mean number of days with fog	12	11	13	13	15	16	19	19	16	14	12	12	172	40

T = trace (not measurable) amount of precipitation
Miss or blank is a missing value

These tables were prepared by the National Climatic Data Center (NCDC), National Environmental Satellite, Data & Information Service (NESDIS), NOAA

CLIMATOLOGICAL DATA – WILMINGTON, DE (39°40'N, 75°36'W) 79 feet (24 m)														
WEATHER ELEMENTS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**YEAR**	**YEARS OF RECORD**
SEA LEVEL PRESSURE (station pressure reduced to sea level)														
Mean (millibars)	1018.7	1018.5	1016.6	1015.4	1015.8	1015.2	1015.9	1016.8	1018.5	1019.0	1018.8	1019.5	1017.4	48
TEMPERATURE (°F)														
Mean	31.8	34.2	42.3	52.7	62.6	71.8	76.5	74.9	67.8	56.5	46.0	36.1	54.5	50
Mean daily maximum	39.6	42.5	51.4	63.0	72.8	81.6	85.9	84.0	77.4	66.5	55.0	44.0	63.8	50
Mean daily minimum	23.6	25.4	32.7	42.0	51.9	61.4	66.9	65.2	57.7	45.9	36.5	27.6	44.8	50
Extreme (highest)	75	78	86	94	96	100	102	101	100	91	85	74	102	50
Extreme (lowest)	-14	-6	2	18	30	41	48	43	36	24	14	-7	-14	50
RELATIVE HUMIDITY														
Average percentage	62.4	60.2	41.3	28.7	33.4	26.7	34.2	43.2	60.1	65.1	63.5	69.8	49.0	50
CLOUD COVER														
Percent of time clear	24.4	27.1	25.7	22.1	20.0	21.1	19.3	21.9	27.4	31.3	25.8	25.8	24.3	47
Percent of time scattered	13.4	13.7	14.9	15.1	17.6	21.2	23.0	21.3	18.5	17.0	15.1	14.6	17.2	47
Percent of time broken	11.7	11.4	12.0	14.7	15.9	19.7	20.5	19.7	15.1	14.2	13.4	11.2	15.0	47
Percent of time overcast	47.1	44.3	43.6	43.4	41.9	32.5	31.4	31.6	34.2	33.3	41.3	45.2	39.1	47
PRECIPITATION (inches)														
Mean amount	3.0	2.8	3.7	3.3	3.6	3.3	4.2	3.7	3.6	2.8	3.3	3.4	41.4	50
Greatest amount	8.4	7.0	7.5	6.8	7.3	7.4	12.6	12.0	9.5	8.0	7.8	7.9	54.7	50
Least amount	0.5	0.8	0.8	0.3	0.2	0.2	0.1	0.2	0.8	0.2	0.4	0.1	24.9	50
Maximum amount (24 hours)	1.9	2.2	2.6	2.2	2.7	4.1	6.6	3.7	4.6	3.6	2.7	2.0	6.6	50
Mean number of days	15	14	16	16	16	14	14	13	12	11	14	15	170	50
SNOW														
Mean amount	6.8	6.2	3.3	0.2	T	0.0	0.0	0.0	0.0	0.1	0.9	3.2	20.7	48
Greatest amount	26.2	27.5	20.3	2.6	T	0.0	0.0	0.0	0.0	2.5	11.9	21.5	48.8	48
Least amount	T	T	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	48
Maximum amount (24 hours)	22.0	14.9	13.0	1.8	T	0.0	0.0	0.0	0.0	2.5	6.8	12.4	22.0	48
Mean number of days	9	7	5	1	Miss	0	0	0	0	Miss	2	6	30	50
WIND														
Percentage with gales	0.01	0.04	0.03	0.00	0.00	0.02	0.01	0.00	0.00	0.02	0.00	0.02	0.03	50
Mean wind speed (knots)	8.5	8.9	9.5	9.1	7.8	7.2	6.7	6.4	6.7	7.0	7.9	8.1	7.8	50
Direction (percentage of observations)														
North	5.2	6.0	5.6	4.8	4.8	4.8	5.1	6.1	7.7	6.8	5.2	5.0	5.6	50
North Northeast	3.9	3.8	4.1	3.5	3.5	3.1	3.5	4.3	5.0	4.9	3.4	3.5	3.9	50
Northeast	4.6	4.9	4.9	4.1	4.5	3.5	2.7	3.3	4.4	4.7	3.9	4.6	4.2	50
East Northeast	4.2	5.6	6.3	5.9	5.6	3.7	2.9	3.6	5.0	5.2	4.4	4.6	4.8	50
East	2.3	2.9	3.8	4.1	4.2	3.1	2.4	2.8	3.8	2.8	2.6	2.6	3.1	50
East Southeast	1.8	2.3	2.5	3.1	3.4	2.7	2.5	2.4	2.8	2.2	2.1	1.7	2.4	50
Southeast	2.0	2.3	3.0	3.6	4.0	4.3	4.0	4.2	3.7	3.0	2.6	1.8	3.2	50
South Southeast	3.2	4.0	5.9	6.6	6.7	7.7	6.8	5.8	5.3	4.4	4.4	3.3	5.3	50
South	5.1	5.3	6.2	7.8	9.1	10.5	9.5	9.3	7.7	6.4	6.2	4.9	7.3	50
South Southwest	4.3	4.0	3.8	4.7	5.7	6.6	6.7	6.7	5.4	4.6	4.8	4.8	5.2	50
Southwest	5.1	4.8	4.2	5.7	7.0	7.6	8.5	7.3	6.3	5.6	5.7	5.3	6.1	50
West Southwest	6.7	5.7	4.6	5.7	6.5	8.1	8.5	7.0	5.8	6.2	7.0	7.1	6.6	50
West	8.3	7.0	6.0	6.5	6.7	6.5	6.8	6.3	5.1	6.5	8.4	8.4	6.9	50
West Northwest	15.3	13.9	13.6	11.5	8.4	8.2	8.5	8.2	7.2	9.5	12.5	14.5	10.9	50
Northwest	15.0	15.1	14.2	11.8	8.9	8.6	9.2	8.7	9.7	11.3	13.8	14.5	11.7	50
North Northwest	7.5	7.3	7.3	6.8	5.6	5.4	6.0	6.5	7.7	7.9	6.5	6.7	6.8	50
Calm	5.6	5.0	4.1	3.8	5.5	5.8	6.6	7.7	7.2	7.8	6.5	6.6	6.0	50
Direction (mean speed, knots)														
North	7.9	8.5	8.6	8.7	7.4	6.9	6.6	6.5	7.0	7.3	7.4	7.7	7.5	50
North Northeast	8.6	8.6	8.7	8.4	8.2	7.4	7.0	7.4	7.5	8.2	8.5	8.2	8.0	50
Northeast	9.3	9.3	9.8	9.3	8.6	8.0	7.3	7.5	8.5	8.8	9.0	8.9	8.8	50
East Northeast	9.4	9.6	10.2	9.7	8.8	8.6	7.4	7.8	8.7	9.3	9.1	9.1	9.1	50
East	6.5	7.5	8.5	8.6	7.7	7.5	6.7	6.8	7.6	7.4	7.5	7.0	7.5	50
East Southeast	6.1	5.9	7.5	7.6	7.0	7.1	6.6	6.2	6.8	6.5	7.4	6.2	6.8	50
Southeast	6.1	6.9	7.5	7.7	7.3	7.1	6.8	6.7	6.7	6.9	7.2	6.1	7.0	50
South Southeast	7.5	8.0	9.5	9.6	9.2	8.7	8.5	8.2	8.2	7.6	8.5	7.7	8.6	50
South	7.2	7.7	8.7	9.2	8.6	8.2	8.0	7.7	7.6	7.3	7.7	7.3	8.0	50
South Southwest	7.3	7.8	9.7	9.4	8.1	7.2	7.3	6.8	7.0	7.2	8.1	7.4	7.7	50
Southwest	7.5	7.9	9.1	8.7	8.1	7.4	7.3	6.8	7.2	7.1	7.3	7.5	7.6	50
West Southwest	7.8	7.8	8.4	8.2	7.5	7.4	7.2	6.6	6.9	7.2	7.5	7.6	7.5	50
West	9.1	9.2	9.4	8.8	7.5	6.8	6.3	6.2	6.5	7.1	8.2	8.4	7.9	50
West Northwest	11.0	11.6	11.8	10.7	8.7	7.7	6.9	6.5	6.8	8.0	9.8	10.1	9.6	50
Northwest	10.7	11.3	11.9	11.2	8.9	8.1	7.2	6.5	6.9	7.9	9.8	10.4	9.6	50
North Northwest	9.4	10.1	10.2	9.9	8.4	7.6	6.8	6.4	6.7	7.2	8.3	9.0	8.4	50
VISIBILITY														
Mean number of days with fog	12	11	13	12	15	15	16	17	16	15	13	13	168	50

T = trace (not measurable) amount of precipitation
Miss or blank is a missing value

These tables were prepared by the National Climatic Data Center (NCDC), National Environmental Satellite, Data & Information Service (NESDIS), NOAA

CLIMATOLOGICAL DATA – PHILADELPHIA, PA (39°53'N, 75°15'W) 62 feet (19 m)														
WEATHER ELEMENTS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**YEAR**	**YEARS OF RECORD**
SEA LEVEL PRESSURE (station pressure reduced to sea level)														
Mean (millibars)	1018.8	1017.8	1016.4	1015.6	1015.6	1015.2	1015.8	1016.7	1018.5	1019.0	1018.4	1019.0	1017.2	56
TEMPERATURE (°F)														
Mean	32.1	34.3	42.4	53.3	63.3	72.4	77.4	75.8	68.4	57.2	46.6	36.5	55.1	50
Mean daily maximum	39.3	42.1	51.2	63.2	73.2	82.2	86.5	84.7	77.5	66.7	55.0	43.7	63.9	50
Mean daily minimum	24.3	26.0	33.2	42.8	52.8	62.1	27.7	66.4	58.8	47.2	37.6	28.7	45.7	50
Extreme (highest)	74	74	85	94	97	100	104	101	100	89	84	72	104	50
Extreme (lowest)	-7	-4	7	19	28	44	51	44	35	25	15	1	-7	50
RELATIVE HUMIDITY														
Average percentage	63.0	52.6	39.0	31.0	31.5	26.9	32.8	41.5	59.7	64.6	59.0	65.5	47.2	57
CLOUD COVER														
Percent of time clear	22.5	25.0	23.1	21.2	17.7	17.8	16.6	19.3	23.4	29.8	23.3	23.4	21.9	50
Percent of time scattered	15.2	15.2	16.2	16.1	18.3	22.3	22.8	23.1	20.5	18.5	16.3	15.4	18.3	50
Percent of time broken	13.8	13.5	14.3	17.0	18.6	21.8	23.0	21.9	18.2	15.7	16.3	13.1	17.3	50
Percent of time overcast	44.7	42.6	42.2	40.8	40.2	32.8	31.8	29.8	32.9	31.4	39.2	43.9	37.6	50
PRECIPITATION (inches)														
Mean amount	3.1	2.7	3.7	3.4	3.6	3.4	4.2	3.9	3.3	2.6	3.3	3.4	41.0	50
Greatest amount	8.8	6.4	7.0	8.1	7.4	7.8	10.4	9.7	8.7	5.9	9.0	8.4	56.4	50
Least amount	0.4	0.7	0.6	0.5	0.4	0.1	0.6	0.4	0.4	0.0	0.3	0.2	29.3	50
Maximum amount (24 hours)	2.2	1.9	2.2	2.4	2.4	4.6	4.3	4.7	4.6	3.8	3.9	0.3	4.7	50
Mean number of days	16	14	16	16	17	14	14	13	12	12	14	15	173	50
SNOW														
Mean amount	6.2	6.5	3.7	0.4	T	0.0	0.0	0.0	0.0	0.0	0.7	3.2	20.7	49
Greatest amount	23.4	27.6	13.4	4.3	T	0.0	0.0	0.0	0.0	2.1	8.8	18.8	57.0	49
Least amount	0.0	T	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	49
Maximum amount (24 hours)	9.3	21.1	11.7	3.5	T	0.0	0.0	0.0	0.0	2.1	5.4	12.4	21.1	49
Mean number of days	9	7	5	1	Miss	0	0	0	0	Miss	2	6	30	50
WIND														
Percentage with gales	0.01	0.02	0.08	0.01	0.00	0.01	0.00	0.00	0.00	0.01	0.03	0.02	0.04	57
Mean wind speed (knots)	9.0	9.5	9.8	9.4	8.3	7.6	7.1	6.8	7.2	7.6	8.3	8.7	8.3	57
Direction (percentage of observations)														
North	6.9	7.5	7.7	6.7	5.6	5.3	5.9	6.6	7.9	7.3	6.1	6.1	6.6	57
North Northeast	3.9	4.0	4.5	3.7	3.5	3.0	2.8	3.9	5.1	4.8	3.7	3.6	3.9	57
Northeast	3.8	3.4	3.6	3.1	3.0	2.1	1.9	2.8	4.0	4.8	3.7	3.8	3.3	57
East Northeast	6.4	6.9	7.5	7.0	6.8	4.6	3.7	5.2	6.9	7.2	5.9	6.4	6.2	57
East	3.4	4.0	4.9	5.6	5.5	4.4	3.5	3.6	4.9	3.9	3.6	3.4	4.2	57
East Southeast	2.1	2.6	3.4	3.9	4.6	3.8	3.8	3.6	4.5	3.2	2.5	2.1	3.3	57
Southeast	1.8	2.1	2.9	3.2	3.9	4.4	3.8	3.4	3.8	2.5	2.4	1.9	3.0	57
South Southeast	2.0	2.5	3.3	3.4	4.4	4.8	5.0	4.6	4.0	3.3	3.0	2.1	3.5	57
South	2.9	3.5	4.4	5.4	5.8	7.0	7.0	6.4	5.3	4.6	4.3	3.5	5.0	57
South Southwest	3.7	3.6	4.5	5.8	6.5	6.9	7.6	7.3	5.9	5.1	4.8	3.7	5.5	57
Southwest	8.4	7.6	7.4	9.4	11.5	13.9	14.7	13.3	10.4	9.7	8.6	8.7	10.3	57
West Southwest	8.5	7.5	6.7	8.6	10.3	12.6	12.5	10.3	9.0	9.6	9.3	9.2	9.5	57
West	10.5	8.8	7.6	7.0	7.0	6.5	6.9	7.0	5.8	7.6	9.4	10.1	7.8	57
West Northwest	13.6	13.3	11.1	9.2	6.7	6.3	6.8	6.8	6.2	8.5	12.0	13.4	9.5	57
Northwest	11.2	11.7	10.0	8.8	6.6	6.5	5.8	5.8	6.2	7.0	9.1	10.7	8.3	57
North Northwest	8.1	8.3	8.6	7.2	5.8	5.4	5.2	5.7	6.7	6.4	7.3	7.6	6.9	57
Calm	3.1	2.7	1.8	1.8	2.5	2.5	3.1	3.7	3.5	4.5	4.3	3.6	3.1	57
Direction (mean speed, knots)														
North	9.0	9.5	9.4	9.5	8.4	7.9	7.0	7.1	7.5	7.8	7.9	8.8	8.3	57
North Northeast	9.7	10.0	9.9	9.7	9.3	8.3	7.6	7.8	8.2	8.7	9.0	9.1	9.0	57
Northeast	10.1	10.3	10.7	10.0	9.3	8.8	7.7	8.3	9.0	9.4	9.5	9.8	9.5	57
East Northeast	9.9	10.2	11.0	10.4	9.7	9.2	8.4	8.6	9.3	9.6	8.9	9.0	9.6	57
East	7.2	8.1	9.3	9.2	8.3	8.1	7.4	7.2	7.7	8.1	7.4	7.3	8.0	57
East Southeast	5.8	6.3	7.3	7.7	7.2	7.0	6.4	6.4	6.6	6.4	6.8	6.3	6.8	57
Southeast	5.7	6.2	7.1	6.8	6.6	6.4	6.0	5.9	6.2	6.2	6.7	5.7	6.3	57
South Southeast	6.7	6.3	7.7	7.6	7.6	6.5	6.3	6.2	6.2	6.6	6.9	6.6	6.8	57
South	7.7	7.8	8.6	8.5	7.8	7.4	7.1	6.8	7.1	6.8	8.0	7.3	7.5	57
South Southwest	8.2	8.5	9.4	9.5	8.6	7.7	7.7	7.3	7.6	7.4	8.4	8.2	8.1	57
Southwest	8.1	8.5	8.8	8.9	8.5	8.0	7.8	7.4	7.5	7.5	8.0	7.9	8.0	57
West Southwest	7.7	8.0	8.3	8.6	8.0	7.8	7.5	7.0	7.0	7.1	7.6	7.7	7.7	57
West	9.3	9.6	10.2	9.3	8.0	7.2	6.8	6.4	6.7	7.4	8.6	9.0	8.3	57
West Northwest	11.2	11.9	12.3	11.5	9.5	8.3	7.7	7.1	7.7	8.8	10.3	11.1	10.2	57
Northwest	10.9	11.8	11.9	11.5	9.5	8.7	7.5	7.0	7.5	8.8	10.2	10.8	10.0	57
North Northwest	10.0	10.6	10.9	10.6	9.2	8.2	7.5	7.0	7.6	8.6	9.9	10.0	9.4	57
VISIBILITY														
Mean number of days with fog	13	11	12	12	14	15	16	17	15	15	13	13	166	50

T = trace (not measurable) amount of precipitation
Miss or blank is a missing value

These tables were prepared by the National Climatic Data Center (NCDC), National Environmental Satellite, Data & Information Service (NESDIS), NOAA

CLIMATOLOGICAL DATA – TRENTON, NJ (40°13'N, 74°46'W) 187 feet (57 m)														
WEATHER ELEMENTS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	YEARS OF RECORD
TEMPERATURE (°F)														
Mean	31.1	32.5	42.2	52.3	62.3	71.4	76.1	75.0	67.5	56.4	46.8	36.3	54.3	19
Mean daily maximum	37.5	39.5	49.9	61.4	71.5	80.3	84.7	83.4	75.8	64.8	53.6	42.4	62.2	19
Mean daily minimum	24.2	25.0	34.0	42.6	52.6	62.0	67.0	66.2	58.7	47.5	39.5	29.7	45.9	19
Extreme (highest)	70	69	83	93	94	98	102	98	96	86	81	72	102	19
Extreme (lowest)	-4	-2	8	24	35	43	53	48	37	28	15	1	-4	19
PRECIPITATION (inches)														
Mean amount	3.1	2.8	3.5	3.0	3.5	3.4	4.6	3.7	4.1	2.8	3.2	3.7	41.9	19
Greatest amount	8.9	5.1	7.3	6.6	6.2	6.2	13.3	9.6	9.0	5.4	7.7	6.9	59.4	19
Least amount	0.3	0.5	0.9	0.8	0.2	0.6	1.3	0.4	0.7	0.0	0.3	0.5	30.4	19
Maximum amount (24 hours)	2.2	2.4	2.2	1.5	2.6	4.4	5.7	4.7	3.3	3.3	2.8	2.4	5.7	19
Mean number of days	5	4	9	11	0	9	8	12	13	4	11	13	99	2
SNOW														
Mean amount	7.6	7.9	3.7	0.5	T	0.0	0.0	0.0	0.0	0.2	0.6	4.3	24.7	19
Greatest amount	20.8	24.3	13.3	4.4	T	0.0	0.0	0.0	0.0	2.5	6.3	15.5	52.7	19
Least amount	0.2	T	T	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.8	19
Maximum amount (24 hours)	9.0	13.4	5.4	3.0	T	0.0	0.0	0.0	0.0	2.4	6.3	11.2	13.4	19
Mean number of days	3	3	2	0	0	0	0	0	0	0	2	10	20	2
VISIBILITY														
Mean number of days with fog	2	1	1	1	0	0	Miss	1	5	3	1	4	19	2

T = trace (not measurable) amount of precipitation
Miss or blank is a missing value

These tables were prepared by the National Climatic Data Center (NCDC), National Environmental Satellite, Data & Information Service (NESDIS), NOAA

CLIMATOLOGICAL DATA – NORFOLK, VA (36°54'N, 76°12'W) 43 feet (13 m)														
WEATHER ELEMENTS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	YEARS OF RECORD
SEA LEVEL PRESSURE (station pressure reduced to sea level)														
Mean (millibars)	1019.6	1018.9	1017.0	1016.1	1016.3	1015.8	1016.7	1017.1	1018.3	1019.2	1019.3	1020.2	1017.9	49
TEMPERATURE (°F)														
Mean	40.5	42.2	49.1	58.3	66.8	74.9	79.4	77.8	72.4	61.9	52.6	44.0	60.1	50
Mean daily maximum	48.4	50.7	58.0	68.0	75.8	83.6	87.5	85.5	80.0	70.1	61.3	52.2	68.5	50
Mean daily minimum	32.1	33.2	39.7	48.1	57.3	65.7	70.8	69.6	64.2	53.2	43.4	35.4	51.2	50
Extreme (highest)	78	82	88	97	100	101	103	104	99	95	86	80	104	50
Extreme (lowest)	-3	8	18	28	36	45	54	49	45	27	20	7	-3	50
RELATIVE HUMIDITY														
Average percentage	70.6	64.1	45.0	35.8	37.6	33.3	41.6	46.3	58.2	66.8	68.3	76.5	53.7	50
CLOUD COVER														
Percent of time clear	26.4	27.5	26.6	26.3	20.9	18.2	16.3	16.9	21.9	29.6	29.8	28.7	24.1	48
Percent of time scattered	13.3	13.0	14.6	17.4	18.0	23.4	24.3	24.2	22.5	18.2	17.3	14.6	18.4	48
Percent of time broken	12.4	12.8	14.0	17.0	20.5	24.3	26.0	26.1	21.8	16.1	15.7	13.5	18.4	48
Percent of time overcast	44.6	43.3	41.3	35.4	35.5	28.7	27.1	27.2	28.6	32.1	33.2	39.2	34.7	48
PRECIPITATION (inches)														
Mean amount	3.6	3.2	3.8	3.0	3.6	3.5	5.2	5.2	3.8	3.3	3.0	3.1	44.8	50
Greatest amount	9.9	6.2	10.3	7.2	10.1	9.7	14.3	14.3	13.8	10.1	7.0	6.1	64.9	50
Least amount	1.0	0.8	0.7	0.4	0.6	0.3	0.3	0.7	0.2	0.5	0.4	0.6	26.4	50
Maximum amount (24 hours)	3.7	2.6	3.7	5.8	3.4	5.7	4.7	7.4	6.4	3.7	3.3	2.5	7.4	50
Mean number of days	15	14	15	14	14	13	14	14	11	11	12	13	160	50
SNOW														
Mean amount	2.9	3.1	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	8.0	48
Greatest amount	14.2	24.4	13.7	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.6	14.7	41.9	48
Least amount	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	T	48
Maximum amount (24 hours)	9.0	13.6	8.1	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.6	10.4	13.6	48
Mean number of days	4	4	2	Miss	0	0	0	0	0	0	Miss	2	12	50
WIND														
Percentage with gales	0.01	0.05	0.02	0.02	0.01	0.00	0.00	0.02	0.04	0.07	0.02	0.01	0.02	50
Mean wind speed (knots)	9.9	10.3	10.7	10.2	9.1	8.4	7.8	7.6	8.3	8.9	9.2	9.5	9.1	50
Direction (percentage of observations)														
North	11.5	11.2	8.6	6.7	5.1	4.0	3.3	4.1	5.9	8.3	8.0	9.9	7.2	50
North Northeast	9.7	10.5	8.5	6.6	6.9	5.5	4.7	6.0	8.1	10.4	8.0	8.9	7.8	50
Northeast	7.5	8.3	9.1	8.3	10.0	9.2	7.8	10.5	13.9	12.5	8.6	7.3	9.4	50
East Northeast	3.0	3.7	4.9	5.6	6.8	6.6	5.4	7.5	8.7	6.8	3.7	3.0	5.5	50
East	1.8	2.7	3.8	3.5	4.6	4.8	4.2	4.8	5.6	4.1	2.8	2.0	3.7	50
East Southeast	1.5	2.3	3.7	4.0	4.4	4.7	3.9	4.0	4.0	2.6	2.3	1.5	3.2	50
Southeast	2.6	3.2	4.2	5.0	5.8	5.9	5.1	5.2	4.8	3.6	3.1	2.5	4.3	50
South Southeast	2.9	3.6	4.7	5.5	5.9	5.6	5.3	5.4	4.4	3.5	3.7	3.1	4.5	50
South	7.0	6.6	7.4	9.0	9.2	9.2	10.2	9.4	8.0	6.8	8.5	7.4	8.2	50
South Southwest	8.2	7.9	8.2	10.3	9.7	11.3	12.8	10.3	8.4	7.7	9.0	8.8	9.4	50
Southwest	9.6	8.7	8.7	10.8	11.0	12.8	15.8	12.4	9.0	8.8	10.4	10.7	10.7	50
West Southwest	6.2	6.2	5.4	5.8	5.7	6.1	7.3	5.4	3.9	4.5	6.1	6.6	5.8	50
West	6.2	5.2	4.7	4.7	3.8	4.1	3.9	3.2	2.6	3.0	5.1	5.9	4.4	50
West Northwest	5.8	5.4	5.3	4.4	3.1	2.6	2.4	1.9	2.1	3.1	5.0	5.7	3.9	50
Northwest	6.8	6.1	5.8	4.2	2.8	2.4	2.1	2.5	3.0	4.8	6.2	7.2	4.5	50
North Northwest	6.9	6.1	5.2	3.9	2.4	2.0	1.7	2.0	2.4	4.4	5.6	6.1	4.1	50
Calm	2.7	2.4	1.8	1.8	2.8	3.2	4.0	5.2	5.1	5.0	3.9	3.6	3.5	50
Direction (mean speed, knots)														
North	11.3	11.9	12.0	12.1	10.6	10.1	8.9	9.5	11.3	11.6	11.2	11.4	11.3	50
North Northeast	10.5	11.2	11.6	11.3	10.7	9.5	8.8	9.8	11.5	12.0	11.0	11.1	10.9	50
Northeast	9.8	10.1	10.5	10.5	10.6	9.9	9.1	9.7	11.1	11.3	10.1	9.4	10.3	50
East Northeast	7.9	9.0	9.8	9.9	9.3	9.5	8.6	8.8	9.7	9.5	8.5	7.9	9.2	50
East	7.0	7.5	8.2	8.2	1.6	7.5	7.0	6.8	7.0	7.6	7.5	7.0	7.4	50
East Southeast	6.5	7.8	8.2	8.2	7.3	7.3	6.6	6.6	6.5	6.9	7.8	7.0	7.2	50
Southeast	7.3	8.0	8.3	8.1	7.8	7.3	6.9	6.5	6.6	6.6	7.3	7.3	7.3	50
South Southeast	7.9	8.2	9.1	8.4	7.9	7.0	6.5	6.6	6.5	6.8	7.9	7.8	7.5	50
South	8.6	8.7	10.3	9.5	8.6	7.8	7.4	7.2	6.9	7.2	8.3	8.4	8.2	50
South Southwest	9.7	10.3	11.0	11.0	9.6	9.1	8.5	7.9	7.9	7.8	8.9	9.4	9.2	50
Southwest	10.8	10.7	11.8	11.2	10.1	9.5	9.0	8.3	8.1	8.3	9.0	9.8	9.6	50
West Southwest	10.9	11.5	11.7	10.9	9.7	9.0	8.4	7.8	8.1	8.3	9.4	10.1	9.7	50
West	10.8	11.2	11.5	10.6	9.0	8.0	7.4	6.8	7.1	7.8	9.5	9.8	9.5	50
West Northwest	10.8	12.0	12.2	11.1	9.1	8.7	7.2	7.2	7.5	8.8	9.9	10.6	10.2	50
Northwest	10.9	11.7	12.3	11.1	9.3	8.1	7.0	6.8	8.1	9.3	10.4	10.7	10.2	50
North Northwest	12.0	11.8	12.3	11.7	10.1	9.0	8.2	8.3	9.9	11.5	11.5	11.6	11.2	50
VISIBILITY														
Mean number of days with fog	13	12	12	11	13	12	13	16	14	14	13	12	155	50

T = trace (not measurable) amount of precipitation
Miss or blank is a missing value

These tables were prepared by the National Climatic Data Center (NCDC), National Environmental Satellite, Data & Information Service (NESDIS), NOAA

CLIMATOLOGICAL DATA – RICHMOND, VA (37°30'N, 77°20'W) 177 feet (54 m)														
WEATHER ELEMENTS	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**YEAR**	**YEARS OF RECORD**
SEA LEVEL PRESSURE (station pressure reduced to sea level)														
Mean (millibars)	1019.7	1019.1	1017.1	1015.9	1016.2	1015.6	1016.4	1017.1	1018.6	1019.4	1019.6	1020.3	1017.9	49
TEMPERATURE (°F)														
Mean	38.0	40.2	48.0	57.6	66.4	74.5	78.4	76.8	70.8	59.5	49.6	40.6	58.5	77
Mean daily maximum	47.2	50.2	58.0	69.4	77.6	85.1	88.3	86.5	80.9	70.6	60.2	50.0	68.8	77
Mean daily minimum	28.3	29.8	36.7	45.3	54.7	63.4	68.1	66.6	60.1	47.8	38.4	30.8	47.6	77
Extreme (highest)	80	82	91	96	98	104	105	103	103	99	86	80	105	77
Extreme (lowest)	-6	-8	11	19	31	40	51	39	35	21	14	1	-8	77
RELATIVE HUMIDITY														
Average percentage	72.4	65.8	45.9	34.0	37.4	31.1	39.5	45.6	61.1	69.3	70.6	78.3	54.2	50
CLOUD COVER														
Percent of time clear	26.9	27.3	27.2	24.5	21.1	19.0	16.8	19.0	25.3	34.0	29.7	29.8	25.0	48
Percent of time scattered	12.7	12.5	13.9	15.9	17.3	21.8	22.1	21.2	18.8	16.4	15.2	13.4	16.8	48
Percent of time broken	12.0	12.1	14.1	17.8	20.0	23.7	26.3	24.1	19.2	14.4	14.5	12.2	17.6	48
Percent of time overcast	44.7	43.9	40.5	36.6	35.3	28.8	28.3	29.4	31.2	30.7	36.3	40.3	35.5	48
PRECIPITATION (inches)														
Mean amount	3.3	2.9	3.6	3.1	3.6	3.6	5.1	4.7	3.3	3.1	2.9	3.1	42.7	77
Greatest amount	10.0	5.9	8.6	7.3	8.8	9.2	16.0	14.1	10.9	9.3	7.6	7.0	61.3	77
Least amount	0.6	0.3	0.9	0.5	0.4	0.3	0.5	0.6	0.2	0.3	0.2	0.4	26.8	77
Maximum amount (24 hours)	3.3	2.6	3.1	2.7	3.0	3.9	7.2	8.7	4.9	4.7	3.0	2.4	8.7	77
Mean number of days	18	16	18	17	18	16	18	17	14	13	15	16	196	77
SNOW														
Mean amount	4.5	3.9	2.1	0.1	0.0	0.0	0.0	0.0	0.0	T	0.4	2.1	13.0	76
Greatest amount	26.2	21.4	19.7	2.5	0.0	0.0	0.0	0.0	0.0	T	9.2	12.5	47.0	76
Least amount	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	T	76
Maximum amount (24 hours)	13.3	13.3	10.6	2.3	0.0	0.0	0.0	0.0	0.0	T	7.2	7.5	13.3	76
Mean number of days	7	6	3	1	0	0	0	0	0	Miss	1	4	22	61
WIND														
Percentage with gales	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	50
Mean wind speed (knots)	7.1	7.5	7.9	7.8	6.8	6.4	6.0	5.5	5.8	6.0	6.5	6.7	6.7	50
Direction (percentage of observations)														
North	9.2	9.6	8.0	7.1	7.0	6.6	6.3	8.0	10.5	10.9	8.9	8.9	8.4	50
North Northeast	8.2	8.5	7.2	5.9	6.3	5.3	5.2	6.8	9.6	9.3	6.8	7.4	7.2	50
Northeast	6.1	6.1	6.3	5.0	6.2	5.1	4.4	6.2	7.3	6.6	5.2	5.6	5.8	50
East Northeast	2.8	3.2	3.8	3.5	4.2	3.9	3.4	4.4	4.4	3.8	2.6	2.9	3.6	50
East	1.9	2.6	3.3	3.3	4.0	3.8	3.7	3.7	3.9	2.9	2.3	1.9	3.1	50
East Southeast	2.1	2.6	3.5	3.8	4.2	4.5	3.9	4.1	3.8	3.2	2.5	1.9	3.4	50
Southeast	3.5	4.0	4.6	5.4	5.8	5.7	5.6	5.3	4.9	4.7	3.9	2.9	4.7	50
South Southeast	4.1	4.3	4.7	5.2	5.7	6.8	6.6	6.7	5.9	4.8	5.2	4.3	5.4	50
South	8.5	7.8	7.5	9.4	10.2	11.1	11.9	10.9	8.8	8.6	9.9	8.9	9.5	50
South Southwest	8.5	8.2	8.5	9.9	10.3	11.2	12.5	10.0	8.0	7.4	9.0	9.5	9.4	50
Southwest	9.0	8.0	7.6	8.3	8.4	9.6	10.7	8.2	6.1	5.9	8.2	8.9	8.3	50
West Southwest	7.0	6.8	6.1	6.3	5.4	6.1	6.1	4.3	3.6	4.1	6.0	6.6	5.7	50
West	6.2	5.1	5.8	5.2	3.9	3.8	3.6	2.7	2.7	3.3	4.7	5.7	4.4	50
West Northwest	5.5	5.6	5.2	5.0	3.5	3.3	2.6	2.3	2.2	3.4	4.6	5.4	4.1	50
Northwest	5.7	6.4	7.1	6.3	4.7	3.8	3.2	3.3	3.8	4.8	5.9	6.0	5.1	50
North Northwest	6.4	6.6	6.8	6.1	5.5	4.7	4.4	5.2	6.4	7.5	6.7	6.9	6.1	50
Calm	5.3	4.5	4.0	4.3	4.7	4.5	5.9	7.9	8.3	8.5	7.6	6.1	6.0	50
Direction (mean speed, knots)														
North	7.6	8.3	8.4	8.5	7.8	7.2	6.6	6.5	6.9	7.2	7.5	7.7	7.5	50
North Northeast	8.0	8.2	8.2	8.5	7.6	7.4	6.9	6.8	7.4	7.7	7.2	7.5	7.6	50
Northeast	6.8	6.8	7.4	7.3	7.0	6.9	6.3	6.2	6.6	6.7	6.3	6.3	6.7	50
East Northeast	5.9	6.8	7.0	6.9	6.4	6.5	6.0	6.0	6.2	6.2	6.2	5.5	6.3	50
East	5.2	5.8	6.4	6.7	6.4	6.2	5.7	5.6	5.8	5.7	5.5	5.2	5.9	50
East Southeast	4.8	6.0	6.3	6.8	6.4	6.0	5.7	5.3	5.7	5.3	5.9	5.2	5.9	50
Southeast	5.3	5.8	6.8	6.7	6.1	5.5	5.6	5.1	5.3	5.0	5.6	5.1	5.7	50
South Southeast	6.0	6.5	7.2	7.4	6.4	6.2	5.8	5.5	5.7	5.6	6.3	5.8	6.2	50
South	6.8	7.0	7.9	8.1	7.0	6.4	6.3	5.7	5.9	6.0	6.8	6.6	6.7	50
South Southwest	7.6	8.1	9.0	8.7	7.9	7.2	6.7	6.3	6.4	6.7	7.3	7.5	7.4	50
Southwest	7.9	8.4	9.0	8.7	7.8	7.3	6.8	6.5	6.6	6.9	7.4	7.4	7.6	50
West Southwest	8.7	8.7	9.0	8.8	7.7	7.4	6.9	6.3	6.6	7.0	7.8	7.8	7.8	50
West	8.3	8.5	8.9	8.3	7.0	6.1	5.9	5.7	5.9	6.6	7.5	7.5	7.5	50
West Northwest	8.7	9.4	9.2	9.1	7.3	6.4	6.3	5.9	6.5	6.8	7.6	8.5	8.0	50
Northwest	8.1	8.8	9.2	8.8	7.4	6.6	6.3	5.5	6.2	7.0	7.6	7.9	7.7	50
North Northwest	8.1	8.4	8.7	8.5	7.4	7.0	6.3	6.1	6.4	6.9	7.7	8.0	7.5	50
VISIBILITY														
Mean number of days with fog	11	10	10	9	13	12	14	17	15	14	11	10	146	61

T = trace (not measurable) amount of precipitation
Miss or blank is a missing value

These tables were prepared by the National Climatic Data Center (NCDC), National Environmental Satellite, Data & Information Service (NESDIS), NOAA

CLIMATOLOGICAL DATA – WASHINGTON (NATIONAL AIRPORT), DC (38°51'N, 77°02'W) 10 feet (3 m)														
WEATHER ELEMENTS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	YEARS OF RECORD
SEA LEVEL PRESSURE (station pressure reduced to sea level)														
Mean (millibars)	1019.8	1018.6	1016.8	1016.0	1016.1	1015.5	1016.2	1016.9	1018.7	1019.5	1019.0	1019.9	1017.7	56
TEMPERATURE (°F)														
Mean	35.9	38.3	46.3	56.7	66.1	74.9	79.4	77.7	71.0	59.8	49.1	39.4	58.0	53
Mean daily maximum	43.3	46.4	55.3	66.7	75.7	84.1	88.0	86.1	79.5	69.0	57.4	46.6	66.7	53
Mean daily minimum	28.1	29.7	36.9	46.3	56.1	65.3	70.3	68.7	61.9	50.2	40.2	31.7	48.9	53
Extreme (highest)	79	82	89	95	99	101	104	105	101	94	86	75	105	53
Extreme (lowest)	-5	4	14	24	34	47	54	49	39	29	16	3	-5	53
RELATIVE HUMIDITY														
Average percentage	73.0	61.2	43.3	35.2	35.5	29.7	36.5	43.5	62.3	69.9	64.5	73.7	52.4	56
CLOUD COVER														
Percent of time clear	22.9	23.5	23.2	21.1	18.6	18.0	16.4	19.7	25.1	31.9	25.6	23.8	22.4	52
Percent of time scattered	14.0	15.1	15.9	16.4	18.5	22.5	23.4	22.8	20.6	17.4	15.9	14.2	18.1	52
Percent of time broken	12.5	12.7	14.1	16.9	18.1	22.3	24.1	21.6	17.2	14.2	14.6	13.0	16.8	52
Percent of time overcast	46.5	45.1	42.6	40.9	39.7	31.6	30.2	30.3	32.3	32.4	39.4	45.0	38.0	52
PRECIPITATION (inches)														
Mean amount	2.8	2.5	3.4	2.8	3.8	3.2	3.9	4.0	3.3	3.0	3.0	3.1	39.3	53
Greatest amount	7.1	5.7	8.4	6.8	10.6	11.5	12.9	14.3	12.3	8.6	6.7	6.5	57.5	53
Least amount	0.3	0.4	0.7	0.0	0.7	0.9	0.9	0.5	0.2	T	0.2	0.2	26.9	53
Maximum amount (24 hours)	1.8	1.9	2.2	3.0	3.2	6.1	4.6	5.4	4.7	3.3	2.5	2.8	6.1	53
Mean number of days	15	13	16	16	17	14	14	14	12	11	13	14	169	53
SNOW														
Mean amount	5.6	5.5	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	2.9	17.1	52
Greatest amount	23.8	30.6	17.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	11.5	16.2	44.6	52
Least amount	T	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	52
Maximum amount (24 hours)	13.8	16.4	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	11.5	11.1	16.4	52
Mean number of days	7	6	4	1	0	0	0	0	0	0	2	5	25	52
WIND														
Percentage with gales	0.01	0.01	0.04	0.00	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.01	56
Mean wind speed (knots)	8.8	9.2	9.6	9.3	8.3	7.8	7.3	7.1	7.3	7.7	8.2	8.4	8.2	56
Direction (percentage of observations)														
North	5.5	5.5	5.6	4.7	4.4	3.9	4.4	5.4	6.6	6.5	5.1	5.4	5.2	56
North Northeast	5.0	5.0	5.0	4.3	4.3	3.9	4.0	5.1	6.5	6.3	4.5	4.6	4.9	56
Northeast	5.7	6.1	6.1	6.1	6.0	4.6	4.1	5.2	6.9	6.9	5.7	5.8	5.8	56
East Northeast	3.3	4.3	4.5	4.3	4.6	3.7	3.1	3.9	4.4	3.9	2.8	3.0	3.8	56
East	1.7	2.2	3.0	3.4	3.7	2.9	2.7	3.0	2.8	2.3	1.7	1.7	2.6	56
East Southeast	1.5	1.9	2.5	2.9	3.1	2.3	2.5	2.5	2.6	1.9	1.6	1.5	2.2	56
Southeast	2.0	2.5	3.1	3.8	4.3	3.7	3.8	3.5	3.6	2.7	2.3	2.0	3.1	56
South Southeast	4.3	4.5	5.5	6.4	8.2	9.1	8.5	8.3	6.5	5.5	4.4	4.0	6.3	56
South	11.9	11.7	10.9	13.0	16.1	17.7	15.5	15.0	13.2	12.9	13.3	11.8	13.6	56
South Southwest	10.0	8.4	8.4	9.7	10.5	12.7	13.4	11.8	10.4	10.0	10.7	11.0	10.6	56
Southwest	4.7	3.9	3.9	4.5	5.0	6.7	8.3	6.9	6.0	6.0	5.8	5.1	5.6	56
West Southwest	3.0	2.4	2.9	2.9	3.1	3.8	4.8	3.6	3.4	3.9	3.9	3.2	3.4	56
West	3.6	3.8	3.8	3.9	3.1	3.3	3.6	3.3	2.6	3.2	3.8	4.0	3.5	56
West Northwest	8.9	9.5	8.0	7.3	5.1	4.3	4.2	3.5	3.6	5.0	7.8	8.3	6.3	56
Northwest	14.4	14.5	13.9	11.1	8.1	7.3	7.0	7.2	7.5	9.3	12.5	13.8	10.5	56
North Northwest	11.7	10.6	10.4	9.3	7.7	7.3	6.9	8.2	9.6	9.8	9.9	10.5	9.3	56
Calm	3.2	3.1	2.6	2.3	2.6	2.8	3.3	3.7	3.8	4.1	4.3	4.3	3.3	56
Direction (mean speed, knots)														
North	8.9	9.4	9.9	9.3	8.8	8.2	7.6	7.6	8.3	8.4	8.3	8.7	8.6	56
North Northeast	9.1	9.0	9.4	9.2	9.0	8.7	8.3	8.4	8.9	9.3	8.2	8.4	8.8	56
Northeast	8.0	7.9	8.7	8.7	8.5	8.4	7.7	7.5	8.2	8.3	7.6	7.4	8.1	56
East Northeast	7.1	7.5	8.4	8.8	8.1	7.8	7.3	7.1	7.6	7.7	7.1	6.9	7.7	56
East	5.9	6.5	7.1	7.5	7.0	7.2	6.7	6.4	6.9	6.3	6.1	6.5	6.8	56
East Southeast	5.5	6.3	7.0	7.6	7.2	6.8	6.7	6.8	6.8	6.3	6.5	5.6	6.7	56
Southeast	5.7	6.4	7.4	7.2	7.5	6.8	7.1	6.5	6.5	6.0	6.7	5.6	6.7	56
South Southeast	6.2	6.6	7.8	7.9	7.9	7.7	7.7	7.1	7.0	6.7	6.7	6.4	7.3	56
South	7.4	7.8	8.8	8.7	8.3	8.0	8.1	7.8	7.8	7.7	8.0	7.3	8.0	56
South Southwest	8.5	8.9	9.9	9.6	8.5	8.1	7.8	7.4	7.6	7.6	8.2	8.1	8.3	56
Southwest	7.3	7.8	7.9	7.9	7.1	6.7	6.5	6.1	5.8	5.7	6.4	6.5	6.7	56
West Southwest	7.0	7.8	8.3	8.1	7.1	6.8	6.3	6.0	5.5	6.0	6.5	7.0	6.8	56
West	9.8	10.6	10.4	9.3	8.2	7.9	6.7	6.7	6.4	7.4	8.8	9.6	8.6	56
West Northwest	12.3	13.2	12.6	11.9	10.2	9.0	8.2	7.8	8.2	10.1	11.4	11.5	11.1	56
Northwest	11.8	12.2	12.4	12.1	10.4	9.5	8.5	7.9	8.5	10.3	11.0	11.7	10.9	56
North Northwest	10.5	10.8	11.0	11.0	9.6	9.1	8.0	7.9	8.3	9.1	9.9	10.3	9.7	56
VISIBILITY														
Mean number of days with fog	11	10	10	9	12	10	10	12	12	13	11	11	131	53

T = trace (not measurable) amount of precipitation
Miss or blank is a missing value

These tables were prepared by the National Climatic Data Center (NCDC), National Environmental Satellite, Data & Information Service (NESDIS), NOAA

CLIMATOLOGICAL DATA – BALTIMORE, MD (39°11'N, 76°40'W) 148 feet (45 m)														
WEATHER ELEMENTS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	YEARS OF RECORD
SEA LEVEL PRESSURE (station pressure reduced to sea level)														
Mean (millibars)	1019.3	1018.4	1016.9	1015.6	1016.1	1015.6	1016.1	1017.0	1018.5	1019.2	1019.0	1019.7	1017.6	48
TEMPERATURE (°F)														
Mean	33.0	35.7	43.7	54.2	63.6	72.7	77.5	75.7	68.8	57.2	46.5	37.0	55.6	47
Mean daily maximum	41.1	44.4	53.3	64.9	74.2	83.2	87.5	85.4	78.6	67.6	56.0	45.2	65.3	47
Mean daily minimum	24.3	26.5	33.6	43.0	52.5	61.8	67.0	65.5	58.4	46.2	36.6	28.3	45.4	47
Extreme (highest)	75	79	87	94	98	101	104	105	100	92	86	77	105	47
Extreme (lowest)	-7	-3	6	20	32	40	50	45	35	25	13	0	-7	47
RELATIVE HUMIDITY														
Average percentage	68.3	53.2	44.4	31.2	36.1	30.9	35.8	44.9	60.4	66.8	64.8	72.5	51.2	49
CLOUD COVER														
Percent of time clear	24.9	25.5	26.3	23.0	21.1	21.6	19.7	21.8	27.3	34.0	27.3	26.2	24.9	47
Percent of time scattered	14.2	14.6	15.2	16.8	17.5	23.8	25.0	22.9	19.4	17.1	15.8	14.6	18.1	47
Percent of time broken	12.7	13.0	14.0	16.7	18.3	21.5	22.5	21.4	17.5	14.7	14.8	13.2	16.7	47
Percent of time overcast	44.7	43.1	40.8	39.0	38.0	28.1	27.6	28.4	31.1	30.2	38.2	42.3	35.9	47
PRECIPITATION (inches)														
Mean amount	3.0	2.9	3.8	3.1	3.6	3.5	3.8	4.0	3.5	3.0	3.2	3.4	41.2	47
Greatest amount	7.8	7.1	8.6	8.1	8.7	9.9	8.1	18.3	8.6	8.0	7.6	7.4	58.9	47
Least amount	0.2	0.4	0.9	0.3	0.3	0.1	0.3	0.7	0.2	T	0.3	0.2	27.8	47
Maximum amount (24 hours)	2.5	3.2	2.4	2.2	3.2	3.8	5.8	4.9	5.0	2.7	3.3	3.3	5.8	47
Mean number of days	15	13	15	15	16	14	14	13	11	11	13	15	165	47
SNOW														
Mean amount	6.3	6.7	3.8	0.1	T	0.0	0.0	0.0	0.0	0.0	0.9	3.3	21.0	47
Greatest amount	32.6	33.1	21.6	0.7	T	0.0	0.0	0.0	0.0	0.3	8.4	20.4	59.7	47
Least amount	T	T	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6	47
Maximum amount (24 hours)	15.8	22.8	11.3	0.7	T	0.0	0.0	0.0	0.0	0.3	8.4	9.3	22.8	47
Mean number of days	8	7	5	1	Miss	0	0	0	0	Miss	2	5	28	47
WIND														
Percentage with gales	0.01	0.02	0.03	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.02	0.01	0.06	49
Mean wind speed (knots)	8.4	8.9	9.3	9.0	7.8	7.2	6.8	6.6	6.9	7.3	8.0	8.0	7.8	49
Direction (percentage of observations)														
North	4.0	4.7	4.5	4.0	3.7	3.8	3.7	4.5	5.6	5.2	3.7	3.9	4.3	49
North Northeast	3.0	3.5	3.4	3.0	3.5	2.8	2.7	3.7	4.5	4.2	2.8	3.2	3.3	49
Northeast	5.2	5.0	5.4	4.4	5.4	3.8	3.5	4.4	5.8	5.5	4.5	5.1	4.8	49
East Northeast	4.8	6.1	6.3	6.2	5.5	3.7	3.6	3.4	4.7	5.1	4.3	4.5	4.8	49
East	3.4	5.1	5.5	5.8	6.1	4.7	3.8	4.1	5.0	4.2	4.2	3.8	4.6	49
East Southeast	2.3	2.8	3.4	3.6	3.9	3.0	3.0	3.0	3.5	2.8	2.3	2.2	3.0	49
Southeast	3.1	3.3	4.4	5.0	5.3	4.8	4.2	4.3	3.9	3.8	3.4	2.5	4.0	49
South Southeast	2.7	3.3	4.1	5.6	5.9	6.7	5.9	6.0	4.7	3.9	3.3	2.7	4.6	49
South	4.0	3.7	4.0	4.9	6.3	8.6	8.0	8.2	7.2	4.9	5.1	4.1	5.7	49
South Southwest	4.2	4.3	3.7	4.8	6.0	7.0	6.9	6.7	6.2	4.9	5.0	5.3	5.4	49
Southwest	6.2	5.5	5.1	6.3	6.7	7.6	8.4	7.1	6.2	6.7	6.8	6.9	6.6	49
West Southwest	6.4	5.4	4.6	5.3	6.5	8.3	9.1	7.3	6.1	6.5	6.9	6.7	6.6	49
West	12.1	10.0	9.8	10.5	10.3	11.0	12.4	12.1	11.0	12.2	12.8	12.1	11.4	49
West Northwest	16.8	15.6	15.1	12.4	9.5	8.8	9.2	8.5	8.4	11.7	15.0	15.3	12.2	49
Northwest	11.0	11.3	11.0	9.4	6.9	6.5	6.4	6.3	6.8	7.2	9.4	10.2	8.5	49
North Northwest	5.4	5.9	6.0	5.1	4.1	4.0	3.8	3.9	5.0	5.0	4.9	5.0	4.8	49
Calm	5.4	4.5	3.8	3.8	4.4	5.0	5.4	6.5	5.4	6.2	5.6	6.5	5.2	49
Direction (mean speed, knots)														
North	7.8	8.2	9.0	8.7	7.9	7.8	6.9	7.3	7.9	8.0	8.0	7.9	8.0	49
North Northeast	7.2	7.6	8.5	8.1	7.7	7.7	6.6	7.3	7.5	7.6	7.5	7.1	7.5	49
Northeast	7.8	7.3	7.9	8.3	7.9	7.6	7.1	7.6	7.5	7.9	7.1	7.0	7.6	49
East Northeast	7.3	7.6	8.8	8.6	8.2	7.7	7.1	7.6	7.9	8.5	7.4	7.3	7.9	49
East	6.0	6.8	7.8	8.3	7.5	7.5	7.0	7.3	7.1	6.9	7.0	6.4	7.2	49
East Southeast	5.6	6.1	7.0	7.7	7.0	7.1	6.7	6.8	6.7	6.5	6.3	5.7	6.7	49
Southeast	6.4	7.2	7.8	8.0	7.6	7.3	6.8	6.8	6.7	6.8	7.1	6.2	7.1	49
South Southeast	6.6	7.5	8.6	8.5	7.8	7.4	7.2	7.1	7.3	7.2	7.5	6.4	7.5	49
South	6.9	7.4	7.9	8.3	7.5	7.2	7.0	6.9	7.2	6.9	7.6	6.6	7.3	49
South Southwest	7.8	8.4	9.6	9.5	7.9	7.3	7.5	7.0	7.4	7.5	8.3	8.0	7.9	49
Southwest	7.7	8.8	9.4	9.5	8.1	7.3	7.3	6.8	7.2	7.4	8.0	7.7	7.9	49
West Southwest	7.8	7.9	8.6	8.3	7.5	7.3	6.9	6.5	6.4	6.9	7.3	7.4	7.3	49
West	9.3	9.7	9.7	9.3	7.9	7.1	6.7	6.5	6.3	7.1	8.3	8.8	8.0	49
West Northwest	11.5	12.1	12.1	11.4	9.2	8.2	7.5	7.0	7.4	8.4	10.2	11.0	10.1	49
Northwest	11.2	12.1	12.2	11.6	10.0	9.3	8.1	8.1	8.6	9.8	10.7	11.1	10.5	49
North Northwest	9.7	10.5	10.4	10.2	9.2	8.5	7.8	7.7	8.3	8.8	9.5	9.6	9.3	49
VISIBILITY														
Mean number of days with fog	11	10	12	10	14	14	14	15	14	13	12	11	150	47

T = trace (not measurable) amount of precipitation
Miss or blank is a missing value

These tables were prepared by the National Climatic Data Center (NCDC), National Environmental Satellite, Data & Information Service (NESDIS), NOAA

METEOROLOGICAL TABLES

COASTAL AREA OFF ATLANTIC CITY, NJ
Between 38°N to 40°N and 70°W to 76°W

WEATHER ELEMENTS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Wind > 33 knots [1]	6.9	6.6	5.9	2.4	0.7	0.3	0.2	0.5	1.1	2.6	4.7	6.5	3.1
Wave Height > 9 feet [1]	14.2	14.6	11.4	7.0	2.7	1.3	0.9	2.6	3.6	7.3	9.8	12.7	7.3
Visibility < 2 nautical miles [1]	4.0	5.7	5.7	7.3	10.9	9.1	5.1	2.7	2.2	2.3	2.1	2.8	5.0
Precipitation [1]	12.1	11.8	8.6	6.4	5.7	4.3	4.0	4.4	5.1	5.7	7.6	9.9	7.0
Temperature > 69° F	0.1	0.2	0.3	0.6	3.1	29.2	84.0	87.8	54.8	12.8	1.7	0.3	24.0
Mean Temperature (°F)	42.8	41.9	45.6	50.3	57.7	67.3	74.3	75.3	70.8	62.7	55.0	47.1	58.0
Temperature < 33° F [1]	14.0	14.8	3.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	4.9	3.0
Mean RH (%)	78	78	78	80	84	85	84	82	79	77	77	76	80
Overcast or Obscured [1]	43.7	41.0	36.7	32.4	31.8	28.4	24.4	21.3	23.2	25.0	31.2	38.9	31.2
Mean Cloud Cover (8^{ths})	5.6	5.4	4.9	4.4	4.5	4.4	4.4	4.3	4.2	4.4	4.9	5.4	4.7
Mean SLP (mbs)	1017	1017	1016	1016	1016	1016	1016	1017	1018	1018	1018	1018	1017
Ext. Max. SLP (mbs)	1047	1047	1039	1040	1039	1036	1034	1035	1037	1043	1043	1046	1047
Ext. Min. SLP (mbs)	982	978	978	984	988	991	996	995	994	989	986	986	978
Prevailing Wind Direction	NW	NW	NW	SW	SW	SW	SW	SW	NE	N	NW	NW	SW
Thunder and Lightning [1]	0.5	0.4	0.7	0.5	0.9	1.2	1.9	2.0	1.4	0.8	0.7	0.6	1.0

COASTAL AREA OFF CHESAPEAKE BAY
Between 36°N to 40°N and 76° to 77°W

WEATHER ELEMENTS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Wind > 33 knots [1]	0.4	1.0	1.0	0.2	0.2	0.0	0.1	0.3	1.2	1.3	1.3	0.8	0.6
Wave Height > 9 feet [1]	0.8	0.4	0.8	1.0	0.5	0.4	0.3	0.2	0.5	0.4	0.8	0.7	0.5
Visibility < 2 nautical miles [1]	9.1	8.1	5.9	6.9	5.7	3.0	2.1	2.8	4.0	4.4	9.6	11.0	5.9
Precipitation [1]	9.3	10.9	9.0	7.0	6.2	4.2	5.8	6.6	8.4	6.1	7.6	10.7	7.6
Temperature > 69° F	0.0	0.2	1.9	6.8	30.2	77.4	96.5	93.1	72.4	18.2	3.9	0.4	35.6
Mean Temperature (°F)	41.8	42.9	49.2	57.1	66.9	75.5	79.1	77.9	74.1	64.4	53.9	44.0	61.6
Temperature < 33° F [1]	17.3	12.7	2.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.6	9.1	3.2
Mean RH (%)	74	72	72	70	75	75	77	77	76	75	73	73	74
Overcast or Obscured [1]	33.5	35.2	28.8	26.0	23.4	19.8	20.3	20.9	24.1	22.6	26.3	32.8	25.9
Mean Cloud Cover (8^{ths})	4.5	4.6	4.2	4.1	4.2	4.3	4.6	4.6	4.4	3.7	4.2	4.6	4.3
Mean SLP (mbs)	1020	1018	1018	1017	1016	1016	1016	1017	1017	1018	1019	1019	1017
Ext. Max. SLP (mbs)	1046	1046	1039	1040	1037	1032	1031	1032	1033	1039	1041	1041	1046
Ext. Min. SLP (mbs)	988	985	987	991	991	994	998	997	994	992	990	987	985
Prevailing Wind Direction	N	N	N	N	SW	SW	SW	SW	NE	N	N	N	SW
Thunder and Lightning [1]	0.0	0.1	0.2	0.4	0.6	0.6	1.0	0.9	0.2	0.2	0.2	0.0	0.4

COASTAL AREA OFF NORFOLK, VA
Between 36°N to 38°N and 72°W to 76°W

WEATHER ELEMENTS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Wind > 33 knots [1]	4.9	5.5	4.7	2.3	0.5	0.4	0.2	0.3	1.1	2.1	3.6	5.0	2.5
Wave Height > 9 feet [1]	9.2	9.6	8.0	4.7	2.1	1.5	0.9	1.3	2.8	5.5	6.5	9.8	4.9
Visibility < 2 nautical miles [1]	3.1	4.4	4.8	4.7	5.2	3.6	1.6	1.3	1.3	1.7	1.7	1.9	2.9
Precipitation [1]	9.3	8.3	6.9	5.5	4.9	4.3	4.2	4.1	4.7	5.6	6.3	7.7	5.9
Temperature > 69° F	1.0	0.9	1.3	4.3	16.1	61.5	96.3	96.9	76.8	25.9	6.6	1.7	33.7
Mean Temperature (°F)	47.6	47.6	50.4	56.2	63.3	71.9	77.6	77.9	73.9	66.1	58.6	51.6	62.3
Temperature < 33° F [1]	6.2	5.5	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.8	1.2
Mean RH (%)	76	76	76	78	81	82	82	81	79	76	74	75	78
Overcast or Obscured [1]	38.3	36.7	33.9	27.9	26.0	22.7	21.0	19.8	20.7	22.7	26.3	34.2	27.3
Mean Cloud Cover (8^{ths})	5.2	5.1	4.8	4.3	4.4	4.4	4.4	4.4	4.2	4.2	4.5	5.1	4.6
Mean SLP (mbs)	1019	1017	1017	1016	1016	1016	1017	1017	1018	1018	1018	1019	1017
Ext. Max. SLP (mbs)	1047	1047	1039	1040	1038	1036	1035	1037	1036	1044	1044	1045	1047
Ext. Min. SLP (mbs)	982	978	978	987	990	991	996	995	993	990	986	986	978
Prevailing Wind Direction	N	NW	N	SW	S	SW	SW	SW	NE	N	N	NW	N
Thunder and Lightning [1]	0.6	0.7	0.9	1.0	1.7	1.8	2.7	2.7	1.4	1.0	0.7	0.6	1.3

[1] Percentage Frequency

These data are based upon observations made by ships in transit. These ships tend to avoid bad weather when possible thus biasing the data toward good weather samples.

Atmospheric Pressure Conversion Table

Inches	Millibars	Inches	Millibars	Inches	Millibars
28.44	963	29.32	993	30.21	1023
28.53	966	29.41	996	30.30	1026
28.62	969	29.50	999	30.39	1029
28.70	972	29.59	1002	30.48	1032
28.79	975	29.68	1005	30.56	1035
28.88	978	29.77	1008	30.65	1038
28.97	981	29.86	1011	30.74	1041
29.06	984	29.94	1014	30.83	1044
28.15	987	30.03	1017	30.92	1047
28.24	990	30.12	1020	31.01	1050

Mean Surface Water Temperatures and Densities

		Sandy Hook, NJ 40°28'N., 74°01'W.	Atlantic City, NJ 39°21'N., 74°25'W.	Breakwater Harbor, DE 38°47'N., 75°06'W.	Philadelphia, PA 39°57'N., 75°08'W.	Kiptopeke Beach, VA 37°10'N., 75°59'W.	Cape Charles (town), VA 37°16'N., 76°01'W.	Virginia Beach, VA 36°50'N., 75°58'W.	Old Point Comfort, VA 37°00'N., 76°18'W.	Little Creek, VA 36°55'N., 76°11'W.	Richmond, VA 37°32'N., 77°25'W.	Gloucester Point, VA 37°15'N., 76°30'W.	Washington, DC 38°52'N., 77°01'W.	Crisfield, MD 37°58'N., 75°52'W.	Solomons, MD 38°19'N., 76°27'W.	Cambridge, MD 38°34'N., 76°04'W.	Annapolis, MD 38°59'N., 76°29'W.	Baltimore, MD 39°16'N., 76°35'W.
Years of Record		32	56	25	39	19	5	9	9	6	21	18	26	2	32	8	23	56
Jan	Temp (°C)	1.6	2.9	2.8	2.3	3.9	5.5	5.3	5.8	4.2	4.7	4.3	2.8	2.6	3.3	4.1	2.9	3.0
	Density	17.0	23.1	20.9	-0.6	19.7	16.0	20.4	14.0	15.8	-0.7	14.7	-0.9	11.9	10.7	6.6	7.9	6.8
Feb	Temp (°C)	1.4	2.3	2.6	2.5	3.9	5.4	4.4	5.8	5.1	5.6	4.6	3.5	4.4	3.1	4.1	2.8	2.8
	Density	16.9	23.2	21.0	-0.6	19.4	15.6	19.8	13.2	15.2	-0.7	13.9	-0.9	17.3	10.3	6.1	7.5	6.7
Mar	Temp (°C)	4.1	4.4	5.3	5.4	6.8	7.5	6.3	9.1	8.3	8.9	7.7	7.7	7.5	6.0	7.1	6.1	5.9
	Density	15.9	23.1	20.6	-0.5	18.6	15.2	19.6	12.0	14.3	-0.7	13.0	-0.8	11.1	9.3	6.1	6.5	5.5
Apr	Temp (°C)	9.1	8.5	9.9	10.8	11.8	12.8	10.7	14.0	12.9	14.8	13.1	14.1	15.0	11.5	13.0	12.0	11.7
	Density	15.0	23.0	20.4	-0.4	18.0	14.8	19.2	12.3	14.3	-0.6	12.6	-0.8	10.9	7.8	5.6	4.8	3.8
May	Temp (°C)	14.6	13.2	15.1	17.5	17.4	18.1	15.7	19.5	18.7	20.7	19.2	20.2	21.9	18.2	19.1	18.3	17.9
	Density	16.2	23.2	20.9	-0.2	18.2	14.6	19.0	12.8	15.0	-0.5	12.6	-0.7	11.6	7.5	5.2	4.6	3.6
Jun	Temp (°C)	20.1	17.9	20.1	23.3	22.4	23.8	20.6	23.9	23.4	25.2	23.8	25.3	26.0	23.6	24.1	23.6	23.4
	Density	17.7	23.5	21.3	-0.2	19.0	15.7	18.8	13.7	16.2	-0.4	13.3	-0.6	11.6	7.8	5.3	5.2	3.8
Jul	Temp (°C)	23.5	20.7	22.9	26.3	25.2	26.6	23.0	26.7	26.1	28.1	26.5	28.3	27.9	26.7	27.1	26.9	26.4
	Density	19.0	23.6	22.1	-0.2	19.4	16.9	19.8	15.1	17.7	-0.4	14.7	-0.5	11.7	8.8	5.6	6.2	4.5
Aug	Temp (°C)	23.5	21.9	23.1	26.1	25.2	26.2	23.7	26.2	26.6	27.4	26.6	27.6	28.4	26.7	26.4	26.6	26.4
	Density	19.1	23.5	22.1	-0.2	20.3	17.4	20.3	15.7	17.6	-0.5	15.4	-0.6	11.6	9.5	5.7	7.0	5.3
Sep	Temp (°C)	20.8	20.9	21.7	23.3	23.1	24.0	22.4	23.9	24.1	24.3	24.2	24.6	24.7	24.2	23.3	23.8	23.9
	Density	19.2	23.4	22.0	-0.2	20.5	17.8	20.1	15.8	17.6	-0.5	15.6	-0.6	12.2	10.5	7.0	8.1	6.5
Oct	Temp (°C)	15.0	16.3	16.8	17.5	17.9	18.8	18.6	18.8	18.8	18.0	18.8	18.3	18.4	18.6	17.4	18.3	18.6
	Density	19.1	23.4	22.1	-0.4	20.4	17.7	20.2	15.8	17.6	-0.6	15.6	-0.7	12.8	11.4	8.0	9.3	7.5
Nov	Temp (°C)	9.3	10.9	11.1	10.8	11.9	12.5	13.7	12.7	12.9	11.3	12.7	11.4	10.7	12.4	11.4	11.6	12.2
	Density	18.4	23.4	21.9	-0.4	20.0	17.6	20.6	15.9	17.0	-0.7	15.6	-0.8	12.4	12.0	8.4	9.8	7.7
Dec	Temp (°C)	3.8	5.3	5.3	4.8	6.6	6.7	8.3	7.3	7.3	5.5	7.7	4.8	4.0	6.3	4.9	5.4	6.1
	Density	17.5	23.2	21.4	-0.6	19.7	16.8	20.6	14.9	16.4	-0.6	15.2	-0.8	12.0	11.4	7.6	8.6	7.3
Mean	Temp (°C)	12.2	12.1	13.1	14.2	14.7	15.7	14.4	16.1	15.7	16.2	15.7	15.7	16.0	15.0	15.2	14.9	14.9
	Density	17.6	23.3	21.4	-0.4	19.4	16.3	19.9	14.3	16.2	-0.6	14.4	-0.7	12.3	9.8	5.9	7.1	5.8

F (Fahrenheit) = 1.8C (Celsius) + 32

Density as used in this table is the specific gravity of the sea water or the ratio between the weight of a sea-water sample and the weight of an equal volume of distilled water at 15°C (59°F).

Atlantic Ocean Distances - Montreal, Canada to the Panama Canal (nautical miles)

	Panama Canal (Pacific)	Panama Canal (Atlantic)	Yucatan Channel	San Juan, PR	Corpus Christi, TX	Galveston, TX	Port Arthur, TX	New Orleans, LA (via SW Pass)	Mobile, AL	Pensacola, FL	Tampa, FL	Straits of Florida	Key West, FL	Jacksonville, FL	Savannah, GA	Charleston, SC	Wilmington, NC	Diamond Shoals	Norfolk, VA	Chesapeake Bay (entrance)	Baltimore, MD	Philadelphia, PA	New York, NY	Nantucket Shoals	Boston, MA	Portland, ME	Gut of Canso (Lock)	Cabot Strait
Montreal, Quebec* (St. Lambert Lock)	3249	3203	2730	2445	3347	3242	3240	3080	3011	2977	2772	2540	2479	2172	2088	2014	1948	1729	1716	1689	1838	1682	1534	1311	1318	1276	717	681
Cabot Strait 45°07.0'N., 60°17.0'W.	2568	2522	2049	1764	2666	2561	2559	2399	2330	2296	2091	1859	1798	1491	1407	1333	1267	1048	1035	1008	1157	1001	853	630	637	595	120	-
Gut of Canso (Lock) 45°39.0'N., 61°25.0'W.	2465	2419	1937	1669	2558	2453	2451	2291	2222	2188	1983	1751	1690	1379	1295	1221	1155	936	923	896	1046	890	742	519	526	484	-	
Portland, ME 43°39.4'N., 70°14.7'W.	2235	2189	1629	1531	2255	2150	2148	1988	1919	1885	1680	1448	1387	1071	987	913	847	628	611	584	734	575	426	203	100	-		
Boston, MA 42°22.0'N., 71°03.0'W.	2195	2149	1589	1486	2215	2110	2108	1948	1879	1845	1640	1408	1347	1031	947	873	807	588	571	544	694	535	386	163	-			
Nantucket Shoals 40°30.0'N., 69°25.0'W.	2032	1986	1426	1334	2052	1947	1945	1785	1716	1682	1477	1245	1184	868	784	710	644	425	408	381	531	372	223	-				
New York, NY 40°42.0'N., 74°01.0'W.	2018	1972	1346	1399	1977	1872	1870	1710	1641	1607	1402	1170	1109	788	704	630	564	345	294	267	417	240	-					
Philadelphia, PA 39°56.8'N., 75°08.3'W.	2001	1955	1323	1395	1954	1849	1847	1687	1618	1584	1379	1147	1086	765	681	607	541	322	269	242	392	-						
Baltimore, MD 39°16.0'N., 76°34.5'W.	1950	1904	1268	1375	1899	1794	1792	1632	1563	1529	1324	1092	1031	710	626	552	486	267	173	150	-							
Chesapeake Bay (entrance) 36°56.3'N., 75°58.6'W.	1800	1754	1118	1225	1749	1644	1642	1482	1413	1379	1174	942	881	560	476	402	336	117	27	-								
Norfolk, VA 36°50.9'N., 76°17.9'W.	1827	1781	1145	1252	1776	1671	1669	1509	1440	1406	1201	969	908	587	503	429	363	144	-									
Diamond Shoals 35°08.0'N., 75°15.0'W.	1683	1637	1001	1114	1632	1527	1525	1365	1296	1262	1057	825	764	443	359	285	219	-										
Wilmington, NC 34°14.0'N., 77°57.0'W.	1655	1609	904	1153	1535	1430	1428	1268	1199	1165	960	728	667	315	227	151												
Charleston, SC 32°47.2'N., 79°55.2'W.	1609	1563	809	1138	1440	1335	1333	1173	1104	1070	865	633	572	197	102	-												
Savannah, GA 32°05.0'N., 81°05.7'W.	1610	1564	780	1156	1411	1306	1304	1144	1075	1041	836	604	543	145	-													
Jacksonville, FL 30°19.2'N., 81°39.0'W.	1559	1513	699	1121	1330	1225	1223	1063	994	960	755	523	462	-														
Key West, FL 24°33.7'N., 81°48.5'W.	1106	1060	251	966	880	775	773	613	544	510	305	73	-															
Straits of Florida 24°25.0'N., 83°00.0'W.	1047	1001	192	1017	807	702	700	540	471	437	232	-																
Tampa, FL 27°56.5'N., 82°26.7'W.	1259	1213	404	1249	810	703	697	502	389	347	-																	
Pensacola, FL 30°24.0'N., 87°13.0'W.	1388	1342	533	1448	618	509	504	288	89	-																		
Mobile, AL 30°42.5'N., 88°02.5'W.	1417	1371	562	1448	605	496	491	269	-																			
New Orleans, LA (via SW Pass) 29°57.0'N., 90°03.7'W.	1442	1396	587	1557	555	446	441	-																				
Port Arthur, TX 29°49.5'N., 93°57.6'W.	1533	1487	691	1717	249	89	-																					
Galveston, TX 29°19.0'N., 94°47.0'W.	1539	1493	696	1719	207	-																						
Corpus Christi, TX 27°48.8'N., 97°24.0'W.	1595	1549	769	1824	-																							
San Juan, PR 18°27.8'N., 66°06.7'W.	1036	990	1111	-																								
Yucatan Channel 21°50.0'N., 85°03.0'W.	855	809	-																									
Panama Canal (Atlantic) 9°23.5'N., 79°55.3'W.	46	-																										
Panama Canal (Pacific) 8°53.0'N., 79°31.0'W.	-																											

All tabular distances are by outside routes which can be used by the deepest-draft vessel that the listed ports can accommodate.
Lighter-draft vessels can save considerable mileage by transiting Canso Lock (Canada), the Cape Cod Canal (Massachusetts), and the Chesapeake and Delaware Canal (Delaware-Maryland); see the detailed tables. Gulf of Mexico distances are through the Shipping Safety Fairways.

*For Quebec City, Canada – subtract 139 miles

Coastwise Distances – New York, NY to Chesapeake Bay entrance, VA
(nautical miles)

	Chesapeake Bay Entrance	Chincoteague, VA	Ocean City, MD	Indian River Inlet, DE	Trenton, NJ	Former U.S. Steel Basin, PA	Philadelphia, PA	Chester, PA	Marcus Hook, PA	Wilmington, DE	C & D Canal, East Entrance	Harbor of Refuge, DE	Delaware Bay Entrance	Cape May Harbor, NJ	Atlantic City, NJ	Barnegat Inlet, NJ	Manasquan Inlet, NJ	New York, NY	Montauk Point, NY	Nantucket Shoals
Nantucket Shoals 40°30.0'N., 69°25.0'W.	381	328	295	285	400	395	372	356	353	347	336	285	285	271	242	221	212	223	113	-
Montauk Point, NY 41°01.7'N., 71°47.3'W.	322	262	227	209	327	322	299	283	280	274	263	212	212	192	157	131	117	122	-	
New York, NY 40°42.0'N., 74°01.0'W.	267	201	161	145	268	263	240	224	221	215	204	153	153	128	94	63	40	-		
Manasquan Inlet, NJ 40°06.9'N., 72°30.3'W.	291	161	121	105	212	207	184	169	165	159	148	98	97	85	52	22	-			
Barnegat Inlet, NJ 39°46.0'N., 74°06.3'W.	199	141	101	86	193	188	165	150	146	140	129	79	78	65	32	-				
Atlantic City, NJ 39°22.6'N., 74°24.9'W.	171	113	73	57	164	159	136	121	117	111	100	50	49	37	-					
Cape May Harbor, NJ 38°57.1'N., 74°52.6'W.	141	80	40	24	131	126	103	88	84	78	67	17	16	-						
Delaware Bay Entrance 38°50.5'N., 75°03.3'W.	155	72	32	15	115	110	87	72	68	62	51	2	-							
Harbor of Refuge, DE 38°49.0'N., 75°05.2'W.	155	71	31	14	116	111	88	73	69	63	52	-								
C & D Canal, East Entrance 39°33.8'N., 75°32.8'W.	206	123	83	66	64	59	36	21	17	11	-									
Wilmington, DE 39°43.2'N., 75°31.5'W.	218	134	95	77	54	49	26	11	8	-										
Marcus Hook, PA 39°48.2'N., 75°25.2'W.	224	140	101	83	46	41	18	3	-											
Chester, PA 39°50.0'N., 75°22.0'W.	227	144	104	86	43	38	15	-												
Philadelphia, PA 39°56.8'N., 75°08.3'W.	242	159	119	101	28	23	-													
Former U.S. Steel Basin, PA 40°08.2'N., 74°45.3'W.	265	182	142	124	5	-														
Trenton, NJ 40°37.6'N., 73°34.9'W.	270	187	147	129	-															
Indian River Inlet, DE 38°36.5'N., 75°03.6'W.	118	60	20	-																
Ocean City, MD 38°19.6'N., 75°05.6'W.	100	41	-																	
Chincoteague, VA 37°56.1'N., 75°22.8'W.	69	-																		
Chesapeake Bay Entrance 36°56.3'N., 75°58.6'W.	-																			

Five Fathom Bank Lighted Buoy F (38°46.8'N., 74°34.5'W.) to Philadelphia, 111 miles
Delaware Lighted Buoy D (38°27.3'N., 74°41.8'W.) to Philadelphia, 116 miles
Chesapeake Light (36°54.3'N., 75°42.8'W.) to Norfolk, 42 miles; to Baltimore, 165 miles

Distances by Intracoastal Waterway – Manasquan Inlet, NJ to Cape May Canal, NJ
(nautical miles)

	C & D Canal (east entrance)	Cape May Canal (west entrance)	Cape May Harbor	Wildwood	Stone Harbor	Avalon	Sea Isle City	Ocean City	Mays Landing	Atlantic City	Beach Haven	Barnegat Inlet	Forked River (town)	Seaside Park	Toms River (town)	Mantoloking	Bay Head	Manasquan Inlet	Shark River Inlet*	New York, NY (The Battery)
New York, NY (The Battery) 40°42.0'N., 74°01.0'W.	190	142	138	133	128	123	119	108	124	97	79	66	63	54	58	46	44	40	34	-
Shark River Inlet* 40°11.2'N., 74°00.5'W.	156	108	103	99	94	89	85	74	90	62	45	32	29	20	23	11	9	6	-	
Manasquan Inlet 40°06.1'N., 74°01.9'W.	150	102	98	93	88	83	79	68	84	57	39	26	23	14	18	6	4	-		
Bay Head 40°03.8'N., 74°03.1'W.	146	98	94	89	85	79	76	64	80	53	35	22	19	10	14	2	-			
Mantoloking 40°02.2'N., 74°03.4'W.	144	96	92	88	83	77	74	63	79	51	33	20	17	9	12	-				
Toms River (town) 39°56.9'N., 74°11.8'W.	142	94	90	86	81	75	72	60	77	49	31	18	15	7	-					
Seaside Park 39°55.3'N., 74°05.0'W.	137	89	85	80	75	70	66	55	71	44	26	13	10	-						
Forked River (town) 39°50.1'N., 74°11.7'W.	132	84	80	75	70	65	61	50	66	39	21	8	-							
Barnegat Inlet 39°46.0'N., 74°06.3'W.	131	83	79	74	69	64	60	49	65	38	20	-								
Beach Haven 39°34.0'N., 74°14.8'W.	111	63	59	54	49	44	40	29	45	18	-									
Atlantic City 39°22.6'N., 74°24.9'W.	95	47	43	39	34	28	25	13	30	-										
Mays Landing 39°26.9'N., 74°43.4'W.	100	52	47	43	38	33	29	18	-											
Ocean City 39°17.3'N., 74°34.4'W.	82	34	30	25	20	15	11	-												
Sea Isle City 39°09.4'N., 74°42.0'W.	71	23	18	14	9	4	-													
Avalon 39°06.6'N., 74°44.0'W.	67	19	15	10	5	-														
Stone Harbor 39°03.4'N., 74°46.0'W.	62	14	9	5	-															
Wildwood 39°00.5'N., 74°49.8'W.	57	9	5	-																
Cape May Harbor 38°57.1'N., 74°52.6'W.	52	4	-																	
Cape May Canal (west entrance) 38°58.0'N., 74°58.0'W.	48	-																		
C & D Canal (east entrance) 39°33.8'N., 75°32.8'W.	-																			

*Outside distances between New York and Manesquan Inlet

Distances on Delaware Bay and River
(nautical miles)

	Trenton, NJ	Bordentown, NJ	(former) U.S. Steel Basin, PA	Burlington, NJ	Philadelphia, PA	Schuylkill River (mouth), PA	Chester, PA	Bridgeport, NJ	Marcus Hook, PA	Wilmington, DE	New Castle, DE	C & D Canal (east entrance)	Salem, NJ	Smyrna River (mouth), DE	Bridgeton, NJ	Mauricetown, NJ	St. Jones River (mouth), DE	Cape May Canal (west entrance)	Roosevelt Inlet, DE	Delaware Bay (entrance)
Delaware Bay (entrance) 38°50.5'N., 75°03.3'W.	115	112	110	103	87	80	72	72	68	62	58	51	54	39	51	33	20	9	6	-
Roosevelt Inlet, DE 38°47.7'N., 75°09.4'W.	116	113	111	104	88	81	73	73	69	63	59	52	55	40	52	37	20	14	-	
Cape May Canal (west entrance) 38°58.0'N., 74°58.0'W.	112	109	107	100	84	77	69	69	65	59	55	48	51	36	47	26	21	-		
St. Jones River (mouth), DE 39°04.0'N., 75°22.5'W.	97	94	92	85	69	63	55	55	51	45	40	34	36	21	35	30	-			
Mauricetown, NJ 39°17.1'N., 74°59.5'W.	115	112	110	103	87	80	72	72	68	62	58	51	54	39	51	-				
Bridgeton, NJ 39°25.5'N., 75°14.2'W.	100	97	95	88	72	65	57	57	53	47	43	36	39	25	-					
Smyrna River (mouth), DE 39°22.2'N., 75°30.2'W.	77	74	72	65	49	42	34	34	30	24	20	13	16	-						
Salem, NJ 39°34.6'N., 75°28.7'W.	69	66	64	57	41	34	26	26	22	16	12	5	-							
C & D Canal (east entrance) 39°33.8'N., 75°32.8'W.	64	61	59	52	36	29	21	21	17	11	7	-								
New Castle, DE 39°39.4'N., 75°33.6'W.	58	55	53	46	30	23	15	15	12	5	-									
Wilmington, DE 39°43.2'N., 75°31.5'W.	54	51	49	42	26	19	11	11	8	-										
Marcus Hook, PA 39°48.2'N., 75°25.2'W.	46	43	41	34	18	12	3	4	-											
Bridgeport, NJ 39°48.0'N., 75°21.3'W.	49	46	44	37	22	14	6	-												
Chester, PA 39°50.0'N., 75°22.0'W.	43	40	38	31	15	9	-													
Schuylkill River (mouth), PA 39°52.8'N., 75°11.9'W.	34	31	29	23	7	-														
Philadelphia, PA 39°56.8'N., 75°08.3'W.	28	25	23	16	-															
Burlington, NJ 40°04.9'N., 74°51.8'W.	12	9	7	-																
(former) U.S. Steel Basin, PA 40°08.2'N., 74°45.3'W.	5	2	-																	
Bordentown, NJ 40°09.1'N., 74°43.0'W.	4	-																		
Trenton, NJ 40°11.4'N., 74°45.4'W.	-																			

Chesapeake Bay Distances
(nautical miles)

	Chesapeake Bay (entrance)	Norfolk, VA	Richmond, VA	Petersburg, VA	Hopewell, VA	Suffolk, VA	Newport News, VA	West Point, VA	Yorktown, VA	Cape Charles, VA	Fredericksburg, VA	Crisfield, MD	Washtington, DC	Potomac River (mouth)	Salisbury, MD	Solomons, MD	Cambridge, MD	St. Michaels, MD	Annapolis, MD	Chestertown, MD	Baltimore, MD	Havre de Grace, MD	Chesapeake City, MD	C & D Canal (east entrance)
C & D Canal (east entrance) 39°33.8'N., 75°32.8'W.	187	209	284	259	265	209	207	214	192	169	243	134	213	122	143	103	98	83	65	78	62	33	13	-
Chesapeake City, MD 39°31.8'N., 75°48.9'W.	174	196	271	246	252	196	194	201	179	156	230	121	200	109	130	90	85	70	52	65	49	20	-	
Havre de Grace, MD 39°32.7'N., 76°05.0'W.	166	175	249	240	230	190	172	185	163	149	224	115	192	101	124	84	78	62	45	61	41	-		
Baltimore, MD 39°16.0'N., 76°34.5'W.	150	173	247	222	228	172	170	174	155	132	206	98	175	84	107	66	60	45	28	45	-			
Chestertown, MD 39°12.4'N., 76°03.8'W.	162	170	244	235	225	185	167	178	156	146	219	110	187	96	119	78	72	59	40	-				
Annapolis, MD 38°59.0'N., 76°28.6'W.	129	140	213	204	194	152	136	152	130	112	186	77	155	64	86	45	39	25	-					
St. Michaels, MD 38°47.2'N., 76°13.2'W.	132	141	215	206	196	156	138	149	126	116	190	80	156	65	89	48	36	-						
Cambridge, MD 38°34.4'N., 76°04.3'W.	123	132	206	197	187	147	129	140	117	107	182	72	149	58	81	39	-							
Solomons, MD 39°19.2'N., 76°27.4'W.	92	100	174	165	155	115	97	109	87	76	150	42	118	27	51	-								
Salisbury, MD 38°21.9'N., 75°36.3'W.	103	113	187	178	168	128	110	122	100	87	165	43	141	49	-									
Potomac River (mouth) 37°57.7'N., 76°16.7'W.	67	89	163	137	144	89	86	90	68	50	125	27	96	-										
Washington, DC 38°52.4'N., 77°01.4'W.	163	185	259	233	240	185	182	186	164	146	221	121	-											
Crisfield, MD 37°58.6'N., 75°51.9'W.	67	77	151	142	132	92	74	86	64	51	129	-												
Fredericksburg, VA 38°17.8'N., 77°27.2'W.	136	146	220	211	201	161	143	154	132	122	-													
Cape Charles, VA 37°15.9'N., 76°01.4'W.	21	32	106	97	88	48	29	50	28	-														
Yorktown, VA 37°14.4'N., 76°30.5'W.	34	58	132	101	114	55	55	22	-															
West Point, VA 37°31.6'N., 76°48.1'W.	56	66	140	123	122	78	63	-																
Newport News, VA 36°58.0'N., 76°26.0'W.	24	12	77	68	58	21	-																	
Suffolk, VA 36°44.3'N., 76°35.0'W.	42	29	98	89	79	-																		
Hopewell, VA 37°19.0'N., 77°16.4'W.	82	70	19	10	-																			
Petersburg, VA 37°14.1'N., 77°24.0'W.	92	80	28	-																				
Richmond, VA 37°31.4'N., 77°25.2'W.	101	90	-																					
Norfolk, VA 36°50.9'N., 76°17.9'W.	27	-																						
Chesapeake Bay (entrance) 36°56.3'N., 75°58.6'W.	-																							

Potomac River Distances
(nautical miles)

	Chain Bridge	Key Bridge	Washington, DC	Bladensburg, MD	Alexandria, VA	Mount Vernon, VA	Indian Head, MD	Occoquan, VA	Quantico, VA	Potomac River (US 301) Bridge	Dahlgren, VA	Colonial Beach, VA	Wicomico River (mouth), MD	Breton Bay (entrance), MD	Nomini Bay, VA	Lower Machodoc Creek, VA	Piney Point, MD	Yeocomico River (mouth), VA	St. Marys River (mouth), MD	Smith Creek (mouth), MD	Coan River (mouth), VA	Potomac River (mouth)
Potomac River (mouth) 37°57.7'N., 76°16.7'W.	101	98	96	101	91	84	76	80	68	44	43	38	31	26	27	23	16	13	12	11	11	-
Coan River (mouth), VA 37°59.7'N., 76°27.1'W.	96	93	90	96	86	79	70	75	63	38	37	33	26	22	22	18	11	6	8	17	-	
Smith Creek (mouth), MD 38°05.8'N., 76°24.0'W.	95	92	89	95	85	78	69	74	62	37	36	32	25	21	21	17	10	8	3	-		
St. Marys River (mouth), MD 38°06.2'N., 76°26.3'W.	93	90	87	93	83	76	68	72	60	35	34	30	23	19	19	15	8	7	-			
Yeocomico River (mouth), VA 38°02.1'N., 76°31.0'W.	94	91	88	94	84	76	68	72	61	36	35	31	24	19	20	16	9	-				
Piney Point, MD 38°08.0'N., 76°32.0'W.	85	82	80	85	75	68	60	64	52	28	27	22	15	11	11	7	-					
Lower Machodoc Creek, VA 38°08.5'N., 76°39.1'W.	80	77	75	80	70	63	55	59	47	22	21	17	10	6	5	-						
Nomini Bay, VA 38°08.6'N., 76°43.4'W.	78	75	72	78	68	60	52	57	45	20	19	15	8	6	-							
Breton Bay (entrance), MD 38°14.0'N., 76°41.8'W.	79	76	74	79	69	62	54	58	46	21	20	16	9	-								
Wicomico River (mouth), MD 38°14.5'N., 76°49.1'W.	71	68	66	71	61	53	45	50	38	13	12	9	-									
Colonial Beach, VA 38°14.4'N., 76°57.9'W.	68	65	63	68	58	51	43	47	35	11	10	-										
Dahlgren, VA 38°19.1'N., 77°02.1'W.	63	60	58	63	53	46	38	42	30	6	-											
Potomac River (US 301) Bridge 38°21.7'N., 76°59.4'W.	58	55	52	58	48	40	32	36	24	-												
Quantico, VA 38°31.2'N., 76°17.2'W.	33	30	28	34	24	16	8	12	-													
Occoquan, VA 38°41.0'N., 77°15.4'W.	33	30	27	33	23	15	7	-														
Indian Head, MD 38°36.4'N., 77°10.0'W.	26	23	20	26	16	8	-															
Mount Vernon, VA 38°42.3'N., 77°05.3'W.	19	16	13	19	9	-																
Alexandria, VA 38°48.2'N., 77°02.3'W.	10	7	4	10	-																	
Bladensburg, MD 38°56.1'N., 76°56.4'W.	14	11	8	-																		
Washington, DC 38°52.4'N., 77°01.4'W.	8	5	-																			
Key Bridge 38°54.1'N., 77°04.2'W.	3	-																				
Chain Bridge 38°55.7'N., 77°07.0'W.	-																					

Distance of Visibility for Objects Having Various Elevations

Height (feet)	Distance (nautical miles)	Distance (statute miles)	Height (meters)
1	1.2	1.3	0.3
2	1.7	1.9	0.6
3	2.0	2.3	0.9
4	2.3	2.7	1.2
5	2.6	3.0	1.5
6	2.9	3.3	1.8
7	3.1	3.6	2.1
8	3.3	3.8	2.4
9	3.5	4.0	2.7
10	3.7	4.3	3.1
11	3.9	4.5	3.4
12	4.1	4.7	3.7
13	4.2	4.9	4.0
14	4.4	5.0	4.3
15	4.5	5.2	4.6
16	4.7	5.4	4.9
17	4.8	5.6	5.2
18	5.0	5.7	5.5
19	5.1	5.9	5.8
20	5.2	6.0	6.1
21	5.4	6.2	6.4
22	5.5	6.3	6.7
23	5.6	6.5	7.0
24	5.7	6.6	7.3
25	5.9	6.7	7.6
26	6.0	6.9	7.9
27	6.1	7.0	8.2
28	6.2	7.1	8.5
29	6.3	7.3	8.8
30	6.4	7.4	9.1
31	6.5	7.5	9.5
32	6.6	7.6	9.8
33	6.7	7.7	10.1
34	6.8	7.9	10.4
35	6.9	8.0	10.7
36	7.0	8.1	11.0
37	7.1	8.2	11.3
38	7.2	8.3	11.6
39	7.3	8.4	11.9
40	7.4	8.5	12.2
41	7.5	8.6	12.5
42	7.6	8.7	12.8
43	7.7	8.8	13.1
44	7.8	8.9	13.4
45	7.8	9.0	13.7
46	7.9	9.1	14.0
47	8.0	9.2	14.3
48	8.1	9.3	14.6
49	8.2	9.4	14.9
50	8.3	9.5	15.2
55	8.7	10.0	16.8
60	9.1	10.4	18.3
65	9.4	10.9	19.8
70	9.8	11.3	21.3
75	10.1	11.7	22.9
80	10.5	12.0	24.4
85	10.8	12.4	25.9
90	11.1	12.8	27.4
95	11.4	13.1	29.0
100	11.7	13.5	30.5
105	12.0	13.8	32.0
110	12.3	14.1	33.5
115	12.5	14.4	33.1

Height (feet)	Distance (nautical miles)	Distance (statute miles)	Height (meters)
120	12.8	14.7	36.6
125	13.1	15.1	38.1
130	13.3	15.4	39.6
135	13.6	15.6	41.2
140	13.8	15.9	42.7
145	14.1	16.2	44.2
150	14.3	16.5	45.7
160	14.8	17.0	48.8
170	15.3	17.6	51.8
180	15.7	18.1	54.9
190	16.1	18.6	57.9
200	16.5	19.0	61.0
210	17.0	19.5	64.0
220	17.4	20.0	67.1
230	17.7	20.4	70.1
240	18.1	20.9	73.2
250	18.5	21.3	76.2
260	18.9	21.7	79.3
270	19.2	22.1	82.3
280	19.6	22.5	85.3
290	19.9	22.9	88.4
300	20.3	23.3	91.4
310	20.6	23.7	94.5
320	20.9	24.1	97.5
330	21.3	24.5	100.6
340	21.6	24.8	103.6
350	21.9	25.2	106.7
360	22.2	25.5	109.7
370	22.5	25.9	112.8
380	22.8	26.2	115.8
390	23.1	26.6	118.9
400	23.4	26.9	121.9
410	23.7	27.3	125.0
420	24.0	27.6	128.0
430	24.3	27.9	131.1
440	24.5	28.2	134.1
450	24.8	28.6	137.2
460	25.1	28.9	140.2
470	25.4	29.2	143.3
480	25.6	29.5	146.3
490	25.9	29.8	149.4
500	26.2	30.1	152.4
510	26.4	30.4	155.5
520	26.7	30.7	158.5
530	26.9	31.0	161.5
540	27.2	31.3	164.6
550	27.4	31.6	167.6
560	27.7	31.9	170.7
570	27.9	32.1	173.7
580	28.2	32.4	176.8
590	28.4	32.7	179.8
600	28.7	33.0	182.9
620	29.1	33.5	189.0
640	29.5	34.1	195.1
660	30.1	34.6	201.2
680	30.5	35.1	207.3
700	31.0	35.6	213.4
720	31.4	36.1	219.5
740	31.8	36.6	225.6
760	32.3	37.1	231.7
780	32.7	37.6	237.7
800	33.1	38.1	243.8
820	33.5	38.6	249.9

This table gives the approximate geographic range of visibility for an object which may be seen by an observer. It is necessary to add to the distance for the height of any object the distance corresponding to the height of the observer's eye above sea level.

Conversion of Degrees to Points and Points to Degrees

Deg °	Min '	Points
000	00	N
002	49	
005	38	N ½ E
008	26	
011	15	N x E
014	04	
016	53	N x E ½ E
019	41	
022	30	NNE
025	19	
028	08	NNE ½ E
030	56	
033	45	NE x N
036	34	
039	23	NE ½ N
042	11	
045	00	NE
047	49	
050	38	NE ½ E
053	26	
056	15	NE x E
059	04	
061	53	NE x E ½ E
064	41	
067	30	ENE
070	19	
073	08	ENE ½ E
075	56	
078	45	E x N
081	34	
084	23	E ½ N
087	11	
090	00	E
092	49	
095	38	E ½ S
098	26	
101	15	E x S
104	04	
106	53	ESE ½ E
109	41	
112	30	ESE
115	19	
118	08	SE x E ½ E
120	56	
123	45	SE x E
126	34	
129	23	SE ½ E
132	11	
135	00	SE
137	49	
140	38	SE ½ S
143	26	
146	15	SE x S
149	04	
151	53	SSE ½ E
154	41	
157	30	SSE
160	19	
163	08	S x E ½ E
165	56	
168	45	S x E
171	34	
174	23	S ½ E
177	11	

Deg °	Min '	Points
180	00	S
182	49	
185	38	S ½ W
188	26	
191	15	S x W
194	04	
196	53	S x W ½ W
199	41	
202	30	SSW
205	19	
208	08	SSW ½ W
210	56	
213	45	SW x W
216	34	
219	23	SW ½ S
222	11	
225	00	SW
227	49	
230	38	SW ½ W
233	26	
236	15	SW x W
239	04	
241	53	SW x W ½ W
244	41	
247	30	WSW
250	19	
253	08	WSW ½ W
255	56	
258	45	W x S
261	34	
264	23	W ½ S
267	11	
270	00	W
272	49	
275	38	W ½ N
278	26	
281	15	W x N
284	04	
286	53	WNW ½ W
289	41	
292	30	WNW
295	19	
298	08	NW x W ½ W
300	56	
303	45	NW x W
306	34	
309	23	NW ½ W
312	11	
315	00	NW
317	49	
320	38	NW ½ N
323	26	
326	15	NW x N
329	04	
331	53	NNW ½ W
334	41	
337	30	NNW
340	19	
343	08	N x W ½ W
345	56	
348	45	N x W
351	34	
354	23	N ½ W
357	11	

Table for Estimating Time of Transit

Distance (nauticalmiles)	Speed (knots)																		
	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	30
	days/ hours	days/ hours	days/ hours	days/ hours	days/ hours	days/ hours	days/ hours	days/ hours	days/ hours	days/ hours	days/ hours	days/ hours	days/ hours	days/ hours	days/ hours	days/ hours	days/ hours	days/ hours	days/ hours
10	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	-	-	-	-	-	-
20	0/3	0/2	0/2	0/2	0/2	0/2	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1
30	0/4	0/3	0/3	0/3	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/1	0/1	0/1	0/1	0/1	0/1
40	0/5	0/4	0/4	0/4	0/3	0/3	0/3	0/3	0/3	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/1
50	0/6	0/6	0/5	0/5	0/4	0/4	0/4	0/3	0/3	0/3	0/3	0/3	0/3	0/2	0/2	0/2	0/2	0/2	0/2
60	0/8	0/7	0/6	0/5	0/5	0/5	0/4	0/4	0/4	0/4	0/3	0/3	0/3	0/3	0/3	0/3	0/3	0/2	0/2
70	0/9	0/8	0/7	0/6	0/6	0/5	0/5	0/5	0/4	0/4	0/4	0/4	0/4	0/3	0/3	0/3	0/3	0/3	0/2
80	0/10	0/9	0/8	0/7	0/7	0/6	0/6	0/5	0/5	0/5	0/4	0/4	0/4	0/4	0/4	0/3	0/3	0/3	0/3
90	0/11	0/10	0/9	0/8	0/8	0/7	0/6	0/6	0/6	0/5	0/5	0/5	0/5	0/4	0/4	0/4	0/4	0/4	0/3
100	0/13	0/11	0/10	0/9	0/8	0/8	0/7	0/7	0/6	0/6	0/6	0/5	0/5	0/5	0/5	0/4	0/4	0/4	0/3
200	1/1	0/22	0/20	0/18	0/17	0/15	0/14	0/13	0/13	0/12	0/11	0/11	0/10	0/10	0/9	0/9	0/8	0/8	0/7
300	1/14	1/9	1/6	1/3	1/1	0/23	0/21	0/20	0/19	0/18	0/17	0/16	0/15	0/14	0/14	0/13	0/13	0/12	0/10
400	2/2	1/20	1/16	1/12	1/9	1/7	1/5	1/3	1/1	1/0	0/22	0/21	0/20	0/19	0/18	0/17	0/17	0/16	0/13
500	2/15	2/8	2/2	1/21	1/18	1/14	1/12	1/9	1/7	1/5	1/4	1/2	1/1	1/0	0/23	0/22	0/21	0/20	0/17
600	3/3	2/19	2/12	2/7	2/2	1/22	1/19	1/16	1/14	1/11	1/9	1/8	1/6	1/5	1/3	1/2	1/1	1/0	0/20
700	3/16	3/6	2/22	2/16	2/10	2/6	2/2	1/23	1/20	1/17	1/15	1/13	1/11	1/9	1/8	1/6	1/5	1/4	0/23
800	4/4	3/17	3/8	3/1	2/19	2/14	2/9	2/5	2/2	1/23	1/20	1/18	1/16	1/14	1/12	1/11	1/9	1/8	1/3
900	4/17	4/4	3/18	3/10	3/3	2/21	2/16	2/12	2/8	2/5	2/2	1/23	1/21	1/19	1/17	1/15	1/14	1/12	1/6
1000	5/5	4/15	4/4	3/19	3/11	3/5	2/23	2/19	2/15	2/11	2/8	2/5	2/2	2/0	1/21	1/19	1/18	1/16	1/9
2000	10/10	9/6	8/8	7/14	6/23	6/10	5/23	5/13	5/5	4/22	4/15	4/9	4/4	3/23	3/19	3/15	3/11	3/8	2/19
3000	15/15	13/21	12/12	11/9	10/10	9/15	8/22	8/8	7/20	7/8	6/23	6/14	6/6	5/23	5/16	5/10	5/5	5/0	4/4
4000	20/20	18/21	16/16	15/4	13/21	12/20	11/22	11/3	10/10	9/19	9/6	8/19	8/8	7/22	7/14	7/6	6/23	6/16	5/13
5000	26/1	23/4	20/20	18/23	17/9	16/1	14/21	13/21	13/1	12/6	11/14	10/23	10/10	9/22	9/11	9/1	8/16	8/8	6/23
6000	31/6	27/19	25/0	22/17	20/20	19/6	17/21	16/16	15/15	14/17	13/21	13/4	12/12	11/22	11/9	10/21	10/10	10/0	8/8

Determination of Wind Speed by Sea Condition

Miles per hour	Knots	Descriptive	Sea Conditions	Wind Force (Beaufort)	Probable Wave Height (feet)
0-1	0-1	Calm	Sea smooth and mirror like	0	-
1-3	1-3	Light Air	Scale-like ripples without foam crests	1	¼
4-7	4-6	Light Breeze	Small, short wavelets; crests have a glassy appearance and do not break.	2	½
8-12	7-10	Gentle Breeze	Large wavelets; some crests begin to break; foam has glassy appearance. Occasional white foam crests.	3	2
13-18	11-16	Moderate Breeze	Small waves, become longer; fairly frequent white foam crests.	4	4
19-24	17-21	Fresh Breeze	Moderate waves, taking a more pronounced long form; many white foam crests; there may be some spray.	5	6
25-31	22-27	Strong Breeze	Large waves begin to form; white foam crests are more extensive everywhere; there may be some spray.	6	10
32-38	28-33	Near Gale	Sea heaps up and white foam from breaking waves begin to be blown in streaks along the direction of the wind; spindrift begins.	7	14
39-46	34-40	Gale	Moderately high waves of greater length; edges of crests break into spindrift; foam is blown in well-marked streaks along the direction of the wind.	8	18
47-54	41-47	Strong Gale	High waves; dense streaks of foam along the direction of the wind; crests of waves begin to topple, tumble and roll over; spray may reduce visibility.	9	23
55-63	48-55	Storm	Very high waves with long overhanging crests. The resulting foam in great patches is blown in dense white streaks along the direction of the wind. On the whole, the surface of the sea is white in appearance. The tumbling of the sea becomes heavy and shock-like. Visibility is reduced.	10	29
64-72	56-63	Violent Storm	Exceptionally high waves that may obscure small and medium-sized ships. The sea is completely covered with long white patches of foam lying along the direction of the wind. Everywhere the edges of the wave crests are blown into froth. Visibility is reduced.	11	37
73+	64+	Hurricane	The air is filled with foam and spray. Sea completely white with driving spray; visibility is very much reduced.	12	45

Standard Abbreviations Used In Broadcasts

Aids to Navigation	
Aeronautical Radiobeacon	AERO RBN
Articulated Daybeacon	ART DBN
Articulated Light	ART LT
Destroyed	DESTR
Discontinued	DISCONTD
Established	ESTAB
Exposed Location Buoy	ELB
Fog Signal Station	FOG SIG
Large Navigation Buoy	LNB
Light	LT
Light List Number	LLNR
Lighted Bell Buoy	LBB
Lighted Buoy	LB
Lighted Gong Buoy	LGB
Lighted Horn Buoy	LHB
Lighted Whistle Buoy	LWB
Ocean Data Acquisition System	ODAS
Privately Maintained	PRIV MAINTD
Radar Beacon	RACON
Radar Reflector	RA REF
Temporarily Replaced by Unlighted Buoy	TRUB
Temporarily Replaced by Lighted Buoy	TRLB
Whistle	WHIS

Light Characteristics	
Alternating	AL
Characteristic	CHAR
Composite Group-Flashing	FL(2+1)
Composite Group-Occulting	OC(2+1)
Continuous Quick-Flashing	Q
Fixed and Flashing	FFL
Fixed	F
Group-Flashing	FL(3)
Group-Occulting	OC(2)
Interrupted Quick-Flashing	IQ
Isophase	ISO
Morse Code	MO(A)
Occulting	OC
Single-Flashing	FL

Colors[1]	
Black	B
Blue	BU
Green	G
Orange	OR
Red	R
White	W
Yellow	Y

Organizations	
Commander, Coast Guard District (#)	CCGD(#)
Coast Guard	CG
Corps of Engineers	COE
National Geospatial-Intelligence Agency	NGA
National Ocean Service	NOS
National Weather Service	NWS

Vessels	
Aircraft	A/C
Fishing Vessel	F/V
Liquefied Natural Gas Carrier	LNG
Motor Vessel[2]	M/V
Pleasure Craft	P/C
Research Vessel	R/V
Sailing Vessel	S/V

Compass Directions	
North	N
South	S
East	E
West	W
Northeast	NE
Northwest	NW
Southeast	SE
Southwest	SW

Months	
January	JAN
February	FEB
March	MAR
April	APR
May	MAY
June	JUN
July	JUL
August	AUG
September	SEP
October	OCT
November	NOV
December	DEC

Days of the Week	
Monday	MON
Tuesday	TUE
Wednesday	WED
Thursday	THU
Friday	FRI
Saturday	SAT
Sunday	SUN

[1] Color refers to light characteristics of Aids to Navigation only
[2] M/V includes: Steam Ship, Container Vessel, Cargo Vessel, etc.

Standard Abbreviations Used In Broadcasts (continued)

Countries and States	
Alabama	AL
Alaska	AK
American Samoa	AS
Arizona	AZ
Arkansas	AR
California	CA
Canada	CN
Colorado	CO
Connecticut	CT
Delaware	DE
District of Columbia	DC
Florida	FL
Georgia	GA
Guam	GU
Hawaii	HI
Idaho	ID
Illinois	IL
Indiana	IN
Iowa	IA
Kansas	KS
Kentucky	KY
Louisiana	LA
Maine	ME
Maryland	MD
Marshall Islands	MH
Massachusetts	MA
Mexico	MX
Michigan	MI
Minnesota	MN
Mississippi	MS
Missouri	MO
Montana	MT
Nebraska	NE
Nevada	NV
New Hampshire	NH
New Jersey	NJ
New Mexico	NM
New York	NY
North Carolina	NC
North Dakota	ND
Northern Mariana Islands	MP
Ohio	OH
Oklahoma	OK
Oregon	OR
Pennsylvania	PA
Puerto Rico	PR
Rhode Island	RI
South Carolina	SC
South Dakota	SD
Tennessee	TN
Texas	TX
United States	US
Utah	UT
Vermont	VT
Virgin Islands	VI
Virginia	VA
Washington	WA
West Virginia	WV
Wisconsin	WI
Wyoming	WY
Various	
Anchorage	ANCH
Anchorage Prohibited	ANCH PROHIB
Approximate	APPROX
Atlantic	ATLC
Authorized	AUTH
Average	AVG
Bearing	BRG
Breakwater	BKW
Broadcast Notice to Mariners	BNM
Channel	CHAN
Code of Federal Regulations	CFR
Continue	CONT
Degrees (temp; geo pos)	DEG
Diameter	DIA
Edition	ED
Effect/Effective	EFF
Entrance	ENTR
Explosive Anchorage	EXPLOS ANCH
Fathom(s)	FM(S)
Foot/Feet	FT
Harbor	HBR
Height	HT
Hertz	HZ
Horizontal Clearance	HOR CL
Hour	HR
International Regulations for Preventing Collisions at Sea	COLREGS
Kilohertz	KHZ
Kilometer	KM
Knot(s)	KT(S)
Latitude	LAT
Local Notice to Mariners	LNM
Longitude	LONG
Maintained	MAINTD
Maximum	MAX
Megahertz	MHZ
Millibar	MB

Standard Abbreviations Used In Broadcasts (continued)

Various (continued)	
Millimeter	MM
Minute (time; geographic position)	MIN
Moderate	MOD
Mountain, Mount	MT
Nautical Mile(s)	NM
Notice to Mariners	NTM
Obstruction	OBSTR
Occasion/Occasionally	OCCASION
Operating Area	OPAREA
Pacific	PAC
Point(s)	PT(S)
Position	POS
Position Approximate	PA
Pressure	PRES
Private/Privately	PRIV
Prohibited	PROHIB
Publication	PUB
Range	RGE
Reported	REP
Restricted	RESTR

Rock	RK
Saint	ST
Second (time; geographic position)	SEC
Signal Station	SIG STA
Station	STA
Statute Mile(s)	SM
Storm Signal Station	S SIG STA
Temporary	TEMP
Thunderstorm	TSTORM
Through	THRU
True	T
Uncovers; Dries	UNCOV
Universal Coordinate Time	UTC
Urgent Marine Information Broadcast	UMIB
Velocity	VEL
Vertical Clearance	VERT CL
Visibility	VIS
Yard(s)	YD
Warning	WARN
Weather	WX
Wreck	WK

Conversion Factors

	Known Value	Multiply By	Unknown Value
Linear	inches	25.40	millimeters
		2.540	centimeters
	centimeters	0.032808	feet
	feet	30.48	centimeters
		0.3048	meters
		0.00016458	nautical miles
	yard	0.9144	meters
	meters	3.2808	feet
		1.094	yards
		0.0005399	nautical miles
	statute miles	0.86897	nautical miles
		1.6093	kilometers
		1,609.3	meters
	nautical miles	1.151	statute miles
Area	square feet	0.0929	square meters
		0.00002296	acres
	square meters	10.764	square feet
		0.0002471	acres
	acres	4,046.9	square meters
		43,560	square feet
		0.404685	hectare
	hectare	2.471054	acres
		10,000	square meters
		1.07639×10^5	square feet
Depths	fathoms	1.8288	meters
	meters	0.54681	fathoms
		3.2808	feet
	feet	0.3048	meters
Rate	feet per second	0.5925	knots
		0.6818	miles per hour
		30.48	centimeters per second
	statute miles per hour	0.8689	knots
		1.467	feet per second
		0.447	meters per second
	knots	1.151	miles per hour
		0.5144	meters per second
		1.6878	feet per second
	centimeters per second	0.01944	knots
		0.02237	miles per hour
		0.032808	feet per second
Mass	grams	0.035275	ounces
		0.002205	pounds
	ounces	28.349	grams
	pounds	0.45359	kilograms
	short tons	2,000	pounds
		0.89286	long tons
		0.9072	metric tons
Mass	long tons	2,240	pounds
		1.12	short tons
		1.016	metric tons
	metric tons	1,000	kilograms
		0.9842	long tons
		1.1023	short tons
		2,204.6	pounds
Volume	barrels (petroleum)	42	gallons (US)
		158.99	liters
	barrels (liquid, US)	31.5	gallons (US)
		26.229	gallons (British)
		119.24	liters
	gallons (US)	0.02381	barrels (petroleum)
		3.7854	liters
	liters	0.26417	gallons (US)

Measurements and Equivalencies

Unit	Equivalency
nautical mile	1,852 meters 6,076.12 feet
statute mile	5,280 feet 1,609.3 meters 1.6093 kilometers
cable	0.1 nautical mile (CN) 720 feet (US)
fathom	6 feet 1.8288 meters
foot	0.3048 meter
inch	2.54 centimeters
meter	39.37 inches 3.281 feet 1.0936 yards
kilometer	1,000 meters
knot	1.6877 feet per second 0.5144 meters per second
miles per hour (statute)	1.466 feet per second 0.44704 meters per second
acre	43,560 square feet 4,046.82 square meters
pound (avoirdupois)	453.59 gram
gram	0.0022046 pound (avoirdupois) 0.035274 ounce
short ton	2,000 pounds
long ton	2,240 pounds
metric ton	2,204.6 pounds
kilogram	2.2 pounds
liter	1.0567 quarts
barrel (petroleum)	42 gallons (US)

Centerline Channel Control Coordinates
(U.S. Army Corps of Engineers)

Philadelphia, PA to Trenton, NJ

Point	Centerline Latitude/Longitude
1	39°58'35.89512"N., 75°04'48.28955"W.
2	39°58'42.39603"N., 75°04'25.88754"W.
3	39°59'16.00467"N., 75°03'47.77305"W.
4	40°00'12.15001"N., 75°03'24.37327"W.
5	40°00'26.53372"N., 75°03'09.47743"W.
6	40°00'57.29306"N., 75°01'57.60590"W
7	40°01'21.71051"N., 75°00'31.75993"W
8	40°02'23.72342"N., 74°59'19.18058"W.
9	40°03'25.11735"N., 74°57'35.73943"W.
10	40°04'14.61350"N., 74°55'38.72299"W.
11	40°04'13.74249"N., 74°54'47.94421"W.
12	40°04'42.40000"N., 74°53'07.50655"W.
13	40°04'55.18578"N., 74°51'48.89976"W.
14	40°05'29.89826"N., 74°51'24.41079"W.
15	40°05'37.69114"N., 74°51'13.51839"W.
16	40°05'56.28486"N., 74°50'29.73883"W.
17	40°06'15.88357"N., 74°50'09.10107"W.
18	40°07'25.19657"N., 74°49'39.80191"W.

Point	Centerline Latitude/Longitude
19	40°07'34.22044"N., 74°49'29.49554"W.
20	40°07'40.41635"N., 74°49'14.06402"W.
21	40°07'41.34734"N., 74°48'59.44053"W.
22	40°07'12.25776"N., 74°47'21.36829"W.
23	40°07'15.96071"N., 74°46'54.94540"W.
24	40°08'00.09210"N., 74°45'46.04408"W.
25	40°08'07.12501"N., 74°45'20.51723"W.
26	40°08'04.27024"N., 74°44'39.87488"W.
27	40°08'07.02033"N., 74°44'27.29246"W.
28	40°08'46.91637"N., 74°43'25.70640"W.
29	40°09'00.47824"N., 74°43'18.24515"W.
30	40°09'39.42068"N., 74°43'19.24918"W.
31	40°10'40.79831"N., 74°44'16.31010"W.
32	40°10'49.50106"N., 74°44'31.19060"W.
33	40°10'56.96672"N., 74°44'59.37255"W.
34	40°11'09.56954"N., 74°45'17.39812"W.
35	40°11'19.82539"N., 74°45'23.75232"W.
36	40°11'31.65023"N., 74°45'26.99340"W.

Philadelphia, PA to Atlantic Ocean

Point	Centerline Latitude/Longitude
1	39°58'24.29332"N., 75°06'19.22985"W.
2	39°57'55.70561"N., 75°07'30.53522"W.
3	39°57'45.70670"N., 75°07'47.31903"W.
4	39°57'36.96777"N., 75°07'59.25461"W.
5	39°57'26.09385"N., 75°08'06.54796"W.
6	39°57'16.83192"N., 75°08'10.43414"W.
7	39°57'03.83701"N., 75°08'14.72435"W.
8	39°56'51.80909"N., 75°08'17.66148"W.
9	39°56'37.80718"N., 75°08'20.35261"W.
10	39°56'25.94826"N., 75°08'20.99764"W.
11	39°56'02.68342"N., 75°08'20.43759"W.
12	39°55'50.17550"N., 75°08'18.57848"W.
13	39°55'27.61465"N., 75°08'11.29507"W.
14	39°55'03.53282"N., 75°07'59.37839"W.
15	39°54'53.43989"N., 75°07'55.16914"W.
16	39°54'43.15697"N., 75°07'52.44597"W.
17	39°54'30.95805"N., 75°07'51.76291"W.
18	39°54'18.74513"N., 75°07'54.09703"W.
19	39°53'27.42546"N., 75°08'15.50218"W.
20	39°53'00.65061"N., 75°08'32.29114"W.
21	39°52'56.54363"N., 75°08'38.01448"W.

Point	Centerline Latitude/Longitude
22	39°52'51.60964"N., 75°08'49.30815"W.
23	39°52'49.84361"N., 75°09'14.61865"W.
24	39°52'57.01533"N., 75°11'29.68060"W.
25	39°51'16.10538"N., 75°14'27.21620"W.
26	39°50'52.83309"N., 75°15'51.65284"W.
27	39°50'57.88182"N., 75°19'47.69097"W.
28	39°50'29.99470"N., 75°21'03.64877"W.
29	39°49'20.59104"N., 75°22'53.41615"W.
30	39°47'02.85156"N., 75°27'32.21922"W.
31	39°44'33.50781"N., 75°29'50.17496"W.
32	39°40'24.37747"N., 75°31'26.74706"W.
33	39°37'35.64029"N., 75°34'41.27460"W.
34	39°37'02.46111"N., 75°34'47.39016"W.
35	39°33'07.45466"N., 75°32'21.21883"W.
36	39°28'58.95540"N., 75°33'48.29555"W.
37	39°27'20.27234"N., 75°33'37.30616"W.
38	39°20'59.92401"N., 75°26'16.11179"W.
39	39°13'56.02831"N., 75°18'06.62977"W.
40	39°10'50.66996"N., 75°16'18.57589"W.
41	39°05'04.57301"N., 75°11'08.61589"W.
42	38°55'10.70000"N., 75°05'45.70000"W.

Tips for Boating Clean & Green

• Practice Preventive Engine Maintenance. Keep your engine well tuned and practice preventative engine maintenance by regularly checking hoses and lines for chaffing or deterioration.

• Use Oil Absorbents. Place and secure an oil absorbent under the engine and in the bilge. Avoid using bilge cleaners as they may get discharged overboard. It is illegal to use soap to disperse fuel and oil spills. Report oil and chemical spills by calling both the National Response Center (800) 424–8802 and 1–800–OILS–911

• Spill-Proof Your Fueling Practices. Use a spill proof system like a portable oil change pump to change your oil. Use oil absorbents when fueling and changing the oil. Do not top-off your fuel tank; leave it 10 percent empty to allow fuel to expand as it warms.

• Reduce Greywater Discharges. Use shore-side facilities for laundry, showers and dish washing whenever possible. Use only phosphate-free and biodegradable soaps. The legality of discharging greywater into a marina or within three miles off the coast varies from place to place. In some areas, there are local ordinances and codes that allow harbor patrol to issue citations for any discharge that is not "clean and clear". To avoid any potential fines and to protect the aquatic environment, do not discharge greywater overboard.

• Dispose of Hazardous Waste Properly: Recycle and properly dispose of absorbents, used oil, oil filters, paint, and batteries at your local household hazardous waste collection site.

• Minimize boat cleaning and maintenance conducted on the water. Use more elbow grease. Use products that are water-based, biodegradable, phosphate-free, and labeled as less toxic. Check out less toxic cleaning alternatives for all types of uses by visiting: http://www.coastal.ca.gov/ccbn/lesstoxic.html. Buy only the amount that you need and use products for spot cleaning only. Properly handle and store materials. Dispose of hazardous waste legally and safely.

• Reduce Discharges from Bottom Paints. Consider alternative, non-biocide hull coatings. Clean the bottom with a soft, non-abrasive sponge. Use hull cleaning companies who use green management practices such as monitoring their divers and using non-abrasive scrubbing agents that do not release paint into the water. For more information visit: http://www.ucanr.org/sites/coast.

• Stow it, Don't Throw it. Keep your trash on-board. Recycle plastic, glass, metal, and paper. Avoid excess packaging.

• Dump at the Pump! It is illegal to discharge untreated sewage anywhere within the three-mile territorial limit including lakes, rivers, reservoirs or coastal waters. Never discharge treated sewage into "restricted waters" such as a marina, swimming/wading areas, a sanctuary, poorly flushed areas, lakes, reservoirs, or freshwater impoundments and federal No Discharge Zones. Use sewage pumpouts, dump stations, or mobile-pumpout services.
For locations visit:
CA – http://www.dbw.ca.gov
WA – http://www.parks.wa.gov/boating/pumpout
OR – http://www.boatoregon.com/OSMB/Clean/CVA.shtml

• Prevent the Spread of Aquatic Invasive Species. Before leaving any body of water, examine your boat and equipment and remove any visible mud, plants, or animals before transporting equipment. Never release plants or animals into a body of water or storm drains unless they came out of that body of water. Clean and dry anything that came in contact with the water. For cleaning procedures visit: http://www.protectyourwaters.net/

For hazardous waste recycling or collection centers call 1-800-CLEAN-UP or visit http://www.earth911.org