

# Proposed National Weather Service Standard Color Curves

NWS Color Curve Working Group

*The statements and color curves presented in this document are a work-in-progress and should not be considered official DOC/NOAA/NWS policy.*

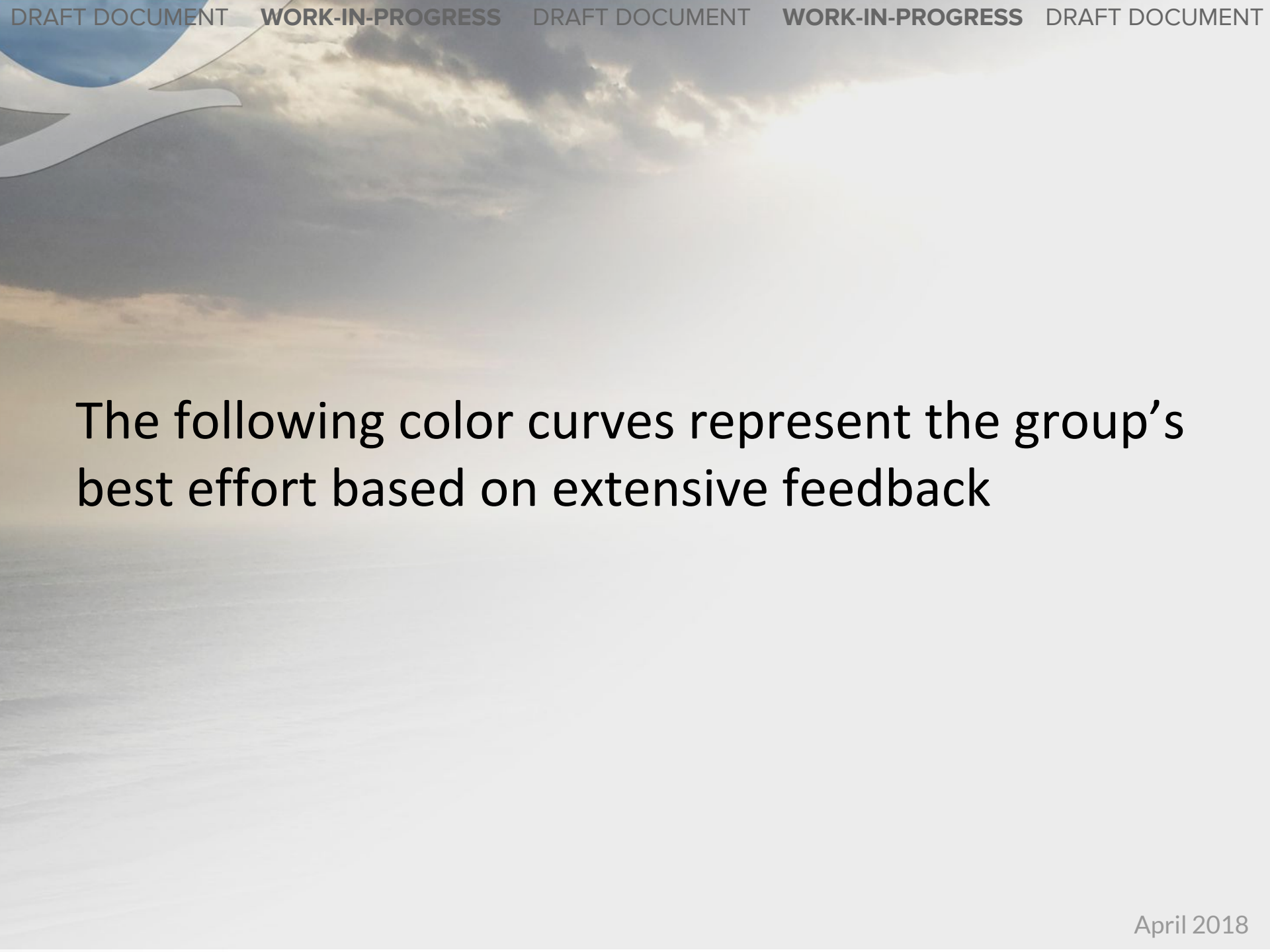
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# Background

**Mission:** Design standard color curves for use with public and NWS partners to improve communication consistency across the agency.

**Process:** Color curves were developed and iterated using best practices and internal feedback, including over a thousand responses from field office employees.



The following color curves represent the group's best effort based on extensive feedback

# Temperature

<b>&lt; -60 (145,0,63)</b>	<b>0 to 5 (13,61,156)</b>	<b>65 to 70 (211,255,190)</b>
<b>-60 to -55 (206,18,86)</b>	<b>5 to 10 (0,102,194)</b>	<b>70 to 75 (255,255,179)</b>
<b>-55 to -50 (231,41,138)</b>	<b>10 to 15 (41,158,255)</b>	<b>75 to 80 (255,237,160)</b>
<b>-50 to -45 (223,101,176)</b>	<b>15 to 20 (74,199,255)</b>	<b>80 to 85 (254,209,118)</b>
<b>-45 to -40 (255,115,223)</b>	<b>20 to 25 (115,215,255)</b>	<b>85 to 90 (254,174,42)</b>
<b>-40 to -35 (255,190,232)</b>	<b>25 to 30 (173,255,255)</b>	<b>90 to 95 (253,141,60)</b>
<b>-35 to -30 (255,255,255)</b>	<b>30 to 35 (48,207,194)</b>	<b>95 to 100 (252,78,42)</b>
<b>-30 to -25 (218,218,235)</b>	<b>35 to 40 (0,153,150)</b>	<b>100 to 105 (227,26,28)</b>
<b>-25 to -20 (188,189,220)</b>	<b>40 to 45 (18,87,87)</b>	<b>105 to 110 (177,0,38)</b>
<b>-20 to -15 (158,154,200)</b>	<b>45 to 50 (6,109,44)</b>	<b>110 to 115 (128,0,38)</b>
<b>-15 to -10 (117,107,177)</b>	<b>50 to 55 (49,163,84)</b>	<b>115 to 120 (89,0,66)</b>
<b>-10 to -5 (84,39,143)</b>	<b>55 to 60 (116,196,118)</b>	<b>&gt; 120 (40,0,40)</b>
<b>-5 to 0 (13,0,125)</b>	<b>60 to 65 (161,217,155)</b>	

# Heat Index/Wind Chill

(AKA Apparent Temperature; Same colors as Temperature, except gray for insignificant values)

< -60 (145,0,63)	-10 to -5 (84,39,143)
-60 to -55 (206,18,86)	-5 to 0 (13,0,125)
-55 to -50 (231,41,138)	0 to 5 (13,61,156)
-50 to -45 (223,101,176)	5 to 10 (0,102,194)
-45 to -40 (255,115,223)	10 to 15 (41,158,255)
-40 to -35 (255,190,232)	15 to 20 (74,199,255)
-35 to -30 (255,255,255)	20 to 25 (115,215,255)
-30 to -25 (218,218,235)	25 to 30 (173,255,255)
-25 to -20 (188,189,220)	30 to 35 (48,207,194)
-20 to -15 (158,154,200)	35 to 40 (0,153,150)
-15 to -10 (117,107,177)	

—Wind Chill —

40 to 75 (220,220,220)

75 to 80 (255,237,160)

80 to 85 (254,217,118)

85 to 90 (254,174,42)

90 to 95 (253,141,60)

95 to 100 (252,78,42)

100 to 105 (227,26,28)

105 to 110 (177,0,38)

110 to 115 (128,0,38)

115 to 120 (89,0,66)

> 120 (40,0,40)

— Heat Index —



# Temperature (Wind Chill/Heat Index) Reasoning

- Tried to choose colors that would be intuitive which is colder/warmer (for zoomed-in maps)
- For Apparent Temperature, values with no significant impact (40 to 75) are a shade of gray

Number of bins	38
Range of values	-60 to 120F
Extreme Low	-70 (CONUS) / -80 (AK)
Extreme Low (Wind Chill)	-105 (Mt Washington)
Extreme High	134
Extreme High (Heat Index)	Unknown, but over 120 likely

Anticipated Use



Very Common, All Seasons

*\*Record values for wind chill/heat index are not officially tracked*  
April 2018

# Dewpoint

<b>&lt;0 (59,34,4)</b>
<b>0 - 10 (84,48,5)</b>
<b>10 - 20 (140,82,10)</b>
<b>20 - 30 (191,129,45)</b>
<b>30 - 40 (204,168,84)</b>
<b>40 - 45 (223,194,125)</b>
<b>45 - 50 (230,217,181)</b>
<b>50 - 55 (211,235,231)</b>
<b>55 - 60 (169,219,211)</b>
<b>60 - 65 (114,184,173)</b>
<b>65 - 70 (49,140,133)</b>
<b>70 - 75 (1,102,95)</b>
<b>75 - 80 (0,60,48)</b>
<b>&gt;80 (0,41,33)</b>

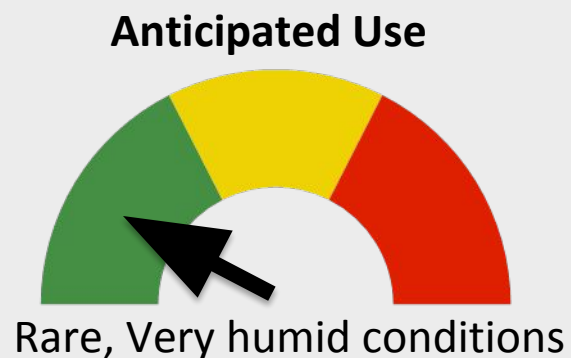


# Dewpoint Reasoning

- Focused on mid to high end dew point values since that's usually when values matter
- Based on ColorBrewer dry to wet color scale

Number of bins	14
Range of values	0 to 80F
Extreme Low	-70 (CONUS) / -80 (AK)
Extreme High	88 (US) / 95 (Global)

*\*Record values for dewpoint are not officially tracked*



# Relative Humidity

**<5 (145,0,34)**

**5 – 10 (166,17,34)**

**10 – 15 (189,46,36)**

**15 – 20 (212,78,51)**

**20 – 25 (227,109,66)**

**25 – 30 (250,143,67)**

**30 – 35 (252,173,88)**

**35 – 40 (254,216,132)**

**40 – 50 (255,242,170)**

**50 – 60 (230,244,157)**

**60 – 70 (188,227,120)**

**70 – 80 (113,181,92)**

**80 – 90 (38,145,75)**

**>90 (0,87,46)**

# Relative Humidity Reasoning

- Focused on low values which have great significance to fire weather forecasting
- Used a red/green scale since this was the most common with fire weather users (deeper red = more dangerous)

Number of bins	15
Range of values	0 to 100%



Sometimes, Common for Fire Weather

# Wind Speed/Gust (mph)

<b>0-5 (16,63,120)</b>	<b>30-35 (223,255,158)</b>	<b>70-80 (255,0,0)</b>
<b>5-10 (34,94,168)</b>	<b>35-40 (255,255,166)</b>	<b>80-100 (168,0,0)</b>
<b>10-15 (29,145,192)</b>	<b>40-45 (255,232,115)</b>	<b>100-120 (110,0,0)</b>
<b>15-20 (65,182,196)</b>	<b>45-50 (255,196,0)</b>	<b>120-140 (255,190,232)</b>
<b>20-25 (127,205,187)</b>	<b>50-60 (255,170,0)</b>	<b>&gt; 140 (255,115,223)</b>
<b>25-30 (180,215,158)</b>	<b>60-70 (255,89,0)</b>	

# Wind Speed/Gust Reasoning

- Focus was on middle values that the majority of offices would be forecasting (i.e. 30 to 60mph)
- Kept resolution at low end due to fire weather sensitivity of what otherwise might be called “weak” wind speeds
- Large bins at the top for tropical storms

Number of bins	17
Range of values	0-140+
Extreme High	



# Sky Cover (Cloud Cover)

**0 - 10% (36, 160, 242)**

**10 - 20% (78, 176, 242)**

**20 - 30% (128, 183, 248)**

**30 - 40% (160, 200, 255)**

**40 - 50% (210, 225, 255)**

**50 - 60% (225, 225, 225)**

**60 - 70% (201, 201, 201)**

**70 - 80% (165, 165, 165)**

**80 - 90% (110, 110, 110)**

**90 - 100% (80, 80, 80)**



# Sky Cover Reasoning

- Fairly intuitive range of colors, using a dark gray instead of black for the highest values

Number of bins	10
Range of values	0 to 100%



# Probability of Precipitation (PoP)

**0 - 10% (245,245,245)**

**10 - 20% (226,246,218)**

**20 - 30% (213,242,202)**

**30 - 40% (192,235,175)**

**40 - 50% (152,223,123)**

**50 - 60% (111,211,73)**

**60 - 70% (67,198,52)**

**70 - 80% (35,183,11)**

**80 - 90% (19,158,7)**

**90 - 100% (11,132,3)**

# Probability of Snow/Ice

**0 - 10% (245,245,245)**

**10 - 20% (227,235,255)**

**20 - 30% (189,214,255)**

**30 - 40% (148,184,255)**

**40 - 50% (102,163,255)**

**50 - 60% (54,144,255)**

**60 - 70% (10,122,250)**

**70 - 80% (0,107,214)**

**80 - 90% (0,78,173)**

**90 - 100% (0,36,135)**

**0 - 10% (245,245,245)**

**10 - 20% (255,217,237)**

**20 - 30% (255,170,250)**

**30 - 40% (255,131,249)**

**40 - 50% (255,87,247)**

**50 - 60% (255,55,245)**

**60 - 70% (230,25,249)**

**70 - 80% (213,0,253)**

**80 - 90% (162,0,173)**

**90 - 100% (100,0,135)**

# Probability of Precipitation Reasoning

- Simple, straightforward progression for light to dark
- Similar color curves for probability of snow and ice

Number of bins	10
Range of values	0 to 100%



# Amount of Precipitation (QPF/QPE)

<b>0.00" (255,255,255)</b>	<b>3.00 – 3.99" (254,141,60)</b>
<b>0.01 – 0.09" (199,233,192)</b>	<b>4.00 – 5.99" (252,78,42)</b>
<b>0.10 – 0.24" (161,217,155)</b>	<b>6.00 – 7.99" (214,26,28)</b>
<b>0.25 – 0.49" (116,196,118)</b>	<b>8.00 – 9.99" (173,0,38)</b>
<b>0.50 – 0.99" (49,163,83)</b>	<b>10.00 – 14.99" (112,0,38)</b>
<b>1.00 – 1.49" (0,109,44)</b>	<b>15.00 – 19.99" (59,0,48)</b>
<b>1.50 – 1.99" (255,250,138)</b>	<b>20.00 – 29.99" (76,0,115)</b>
<b>2.00 – 2.99" (255,204,79)</b>	<b>30.00 – 50.00"+ (255,219,255)</b>

# Amount of Precipitation (QPF/QPE) Reasoning

- Uses common, recognizable Green-Yellow-Red progression similar to common radar imagery
- Last two bins were added for monthly/annual precipitation maps and in response to Hurricane Harvey

Number of bins	16
Range of values	0 to 50"
Extremes (24 hours)	51.88" (TX, Harvey) 42" (previous TX record) 32.52" (AL) <i>41 states have records less than 20"</i>





# Snow Amount

<b>0 (255,255,255)</b>	<b>6-8" (255,255,150)</b>
<b>&lt; 1" (189,215,231)</b>	<b>8-12" (255,196,0)</b>
<b>1-2" (107,174,214)</b>	<b>12-18" (255,135,0)</b>
<b>2-3" (49,130,189)</b>	<b>18-24" (219,20,0)</b>
<b>3-4" (8,81,156)</b>	<b>24-30" (158,0,0)</b>
<b>4-6" (8,38,148)</b>	<b>30-36" (105,0,0)</b>
	<b>36"+ (54,0,0)</b>

# Snow Amount (Seasonal\*)

**IN DEVELOPMENT**

0 (255,255,255)	0-8" (255,255,150)	48-72" (204,204,255)
< 1" (189,215,231)	8-12" (255,196,0)	72-120" (159,140,216)
1-2" (107,174,214)	12-18" (255,135,0)	120-180" (124, 82, 165)
2-3" (49,130,189)	18-24" (219,20,0)	180-300" (86,28,114)
3-4" (8,81,156)	24-30" (158,0,0)	300-600" (46,0,51)
4-6" (8,38,148)	30-36" (105,0,0)	> 600" (255,190,232)
	36-48" (54,0,0)	

**NOT FINAL**

**RECOMMENDATION**

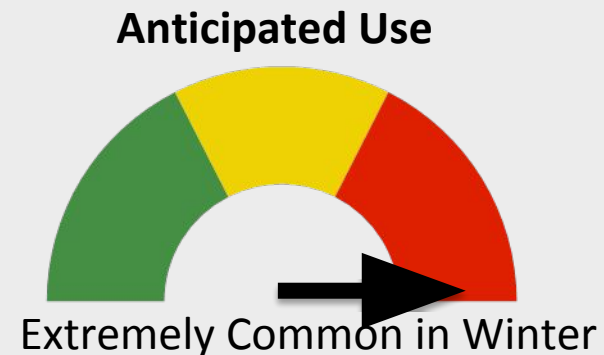
	6'-8'	4-6'
< 1"	8-12"	6-10'
1-2"	12-18"	10-15'
2-3"	18-24"	15-25'
3-4"	24-30"	25-50'
4-6"	30-36"	> 50'
	3'-4'	

*\*Designed to be used for seasonal snowfall maps, but can be used for forecast maps if there are values over 36"*

# Snow Amount Reasoning

- High detail for low-end amounts, which are the majority of graphics
- Yellow-Red scale for high-impact values
- Limited extreme values due to limited impact differences and rare occurrences where high impacts are possible

<b>Number of bins</b>	13 (14)
<b>Range of values</b>	0 to 36" (48")
<b>Common Thresholds</b>	Advisory 2-5" Warning 6-8"+
<b>Extremes 24hrs/72hrs</b>	78" / 147" (AK) 49" / 86.5" (NY) 36" / 46.5" (MN)



# Ice Amount

**0.01 – 0.09” (243,234,59)**

**0.10 – 0.24” (255,192,0)**

**0.25 – 0.49” (255,0,0)**

**0.50 – 0.74” (192,0,0)**

**0.75 – 0.99” (153,102,255)**

**1.00 – 2.00” (114,10,200)**

**2.00” + (36,5,91)**

# Ice Amount Reasoning

- Any ice is dangerous, so starts at a yellow “caution” color
- Shades of red for warning criteria
- Shades of purple for extreme impacts

Number of bins	7
Range of values	0 to 2”
Common Thresholds	Ice Storm Warning 0.25” (Except 0.5” for New England)
Extremes	Over 3” is extreme, but anything over 2” impacts will be extreme

**Anticipated Use**



Rare, But High Visibility When Used

# Wave Height (feet)

<b>0-1 (235,253,255)</b>	<b>15-20 (254,178,76)</b>
<b>1-2 (171,237,245)</b>	<b>20-25 (253,141,60)</b>
<b>2-3 (120,205,214)</b>	<b>25-30 (252,78,42)</b>
<b>3-4 (75,184,196)</b>	<b>30-35 (227,26,28)</b>
<b>4-5 (85,181,159)</b>	<b>35-40 (189,0,38)</b>
<b>5-7 (134,212,131)</b>	<b>40-50 (128,0,38)</b>
<b>7-10 (176,232,144)</b>	<b>50-60 (92,0,47)</b>
<b>10-12 (221,255,153)</b>	<b>60+ (51,0,35)</b>
<b>12-15 (254,217,118)</b>	



# Wave Height Reasoning

- Using a decreased-saturation rainbow curve with shades of blue at the bottom designed not to be confused with water
- Balances needs of Great Lakes versus High Seas with more resolution at low values

Number of bins	17
Range of values	0 to 60 feet
Common Thresholds	12' – “High Seas”
Extreme Values – Great Lakes	20-30' (upper lakes) 15-25' (lower lakes)
Extreme Values – High Seas	50-60'

**Anticipated Use**



Rare, Marine offices

