

## **SUMMARY HABITAT LOSS FOR VIRGINIA TIDAL WATERS**

Different models were applied for each habitat type depending on known requirements; e.g. eelgrass has known temperature thresholds, thus temperature limits were combined with projected SLR to determine loss.

Land and shoreline development will likely affect the character and magnitude of climate impact, since it effectively prevents the migration of coastal habitats landward. This effort uniquely integrated an inundation model with riparian development and shoreline hardening information to project potential future habitat loss.

### Habitat shifts projected for Sea level Rise Scenario 2 (0.6 m - 2050 & 1.6 m - 2100)

#### **Shallow water (0-2m) loss**

2050 = 18%

2100 = 51%

#### **Eelgrass loss (Polyhaline regions only)**

1°C rise – 2050 = 9%; 2100 = 80%

3°C rise - 2050 = 68%; 2100 = 94%

6°C rise - 100% loss by 2050

#### **Other SAV loss (Meso-Tidal fresh regions)**

2050 = 24%

2100 = 76%

#### **Tidal Wetlands Habitat loss (vegetated & non-vegetated wetlands)**

2050 = 22%

2100 = 52%

### Vulnerability to Sea Level Rise based on the landscape setting in which the habitat resides

#### **Tidal Marsh Vulnerability**

Highly vulnerable = 13%

Moderately vulnerable = 25%

Low vulnerability = 62% (*marshes exist in landscapes that would allow transgression*)

#### **Estuarine Beach Vulnerability**

Highly vulnerable = 26%

Moderately vulnerable = 60%

Low vulnerability = 14% (*beaches exist in landscapes that would allow transgression*)

Table 1. Estimated shallow water habitat shifts based on two sea level rise (SLR) scenarios in the years 2050 and 2100. Eelgrass shifts were further evaluated at three different temperature elevations (1, 3 and 6°C). \*Total habitat includes shallow water, tidal wetlands, eelgrass (1°C increase only) and mixed SAV.

Habitat	Current km <sup>2</sup>	2050				2100			
		S1 - 0.2m SLR		S2 - 0.6m SLR		S1 - 0.7m SLR		S2 - 1.6m SLR	
		km <sup>2</sup>	% change						
Shallow water	1110	994	(10.5)	911	(17.9)	867	(21.9)	546	(50.8)
Tidal wetlands	397	348	(12.4)	311	(21.6)	302	(23.9)	191	(52.0)
Eelgrass									
1°C	114	111	(3.0)	104	(9.2)	102	(11.0)	23	(80.1)
3°C	114	40	(65.3)	37	(67.5)	37	(68.1)	7	(93.5)
6°C	114	0	(100.0)	0	(100.0)	0	(100.0)	0	(100.0)
Mixed SAV	133	115	(13.4)	101	(23.8)	97	(26.8)	31	(76.4)
Total habitat*	1754	1568	(10.6)	1427	(18.6)	1368	(22.0)	791	(54.9)

Table 2. Tidal marsh and beach vulnerability (High, Moderate and Low) to sea level rise induced loss. The amount (area or linear distance) and percentage of habitat estimated to be at each level of risk is presented.

Habitat	Current	High		Moderate		Low	
		Amt	%	Amt	%	Amt	%
Tidal marsh	510 km <sup>2</sup>	66.6 km <sup>2</sup>	13.1	126.8 km <sup>2</sup>	24.9	316.2 km <sup>2</sup>	62.1
Estuarine beach	812 km	215.1 km	26.5	485.8 km	59.8	111.3 km	13.7