



2021 Coastal Habitat Protection Plan
*Wetland Protection and Enhancement With Focus of Nature-
Based Solutions*



DEPARTMENT OF ENVIRONMENTAL QUALITY

Marine Fisheries Commission | Anne Deaton, Division Marine Fisheries | February 25, 2021



Coastal Wetland Classifications and Locations

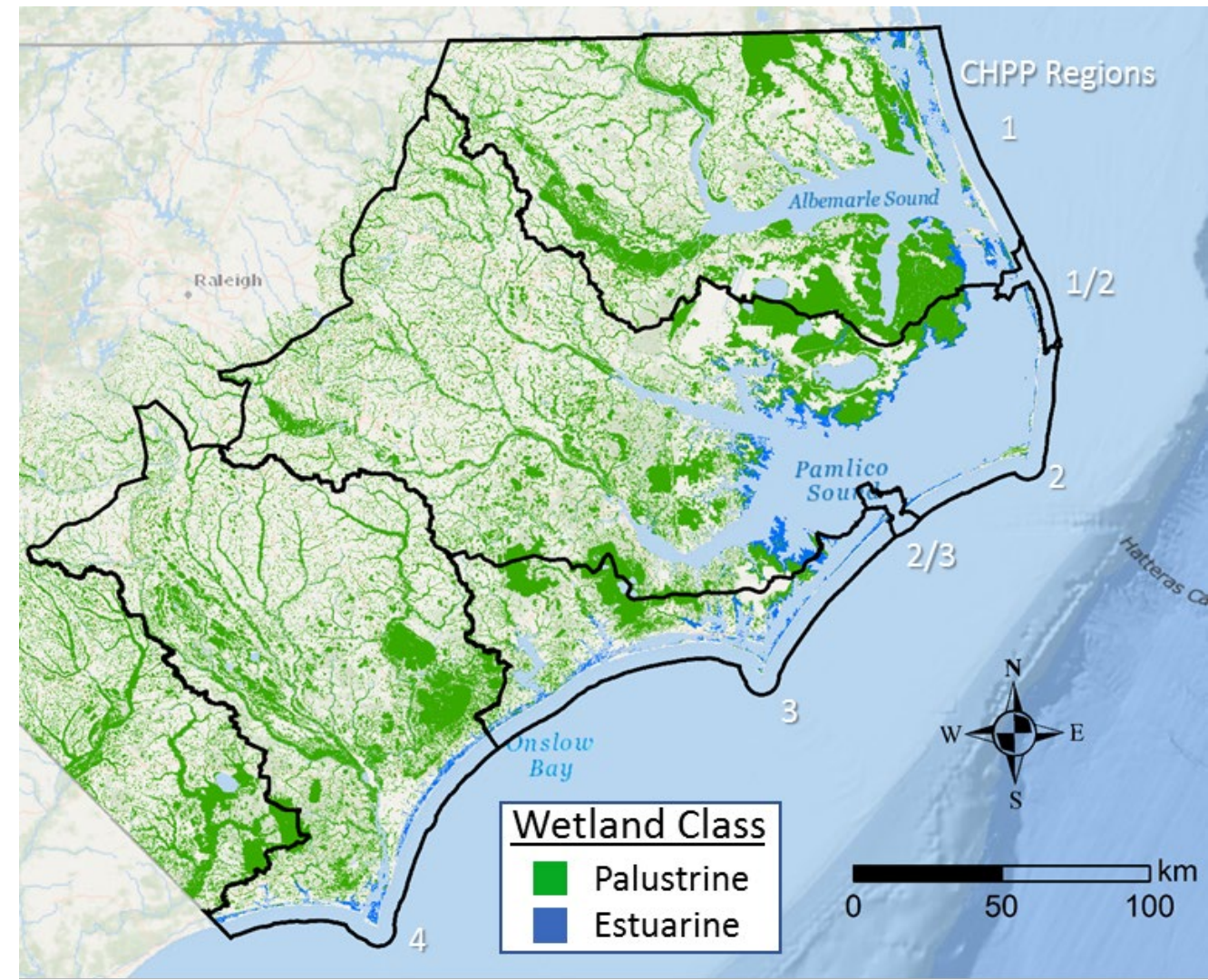
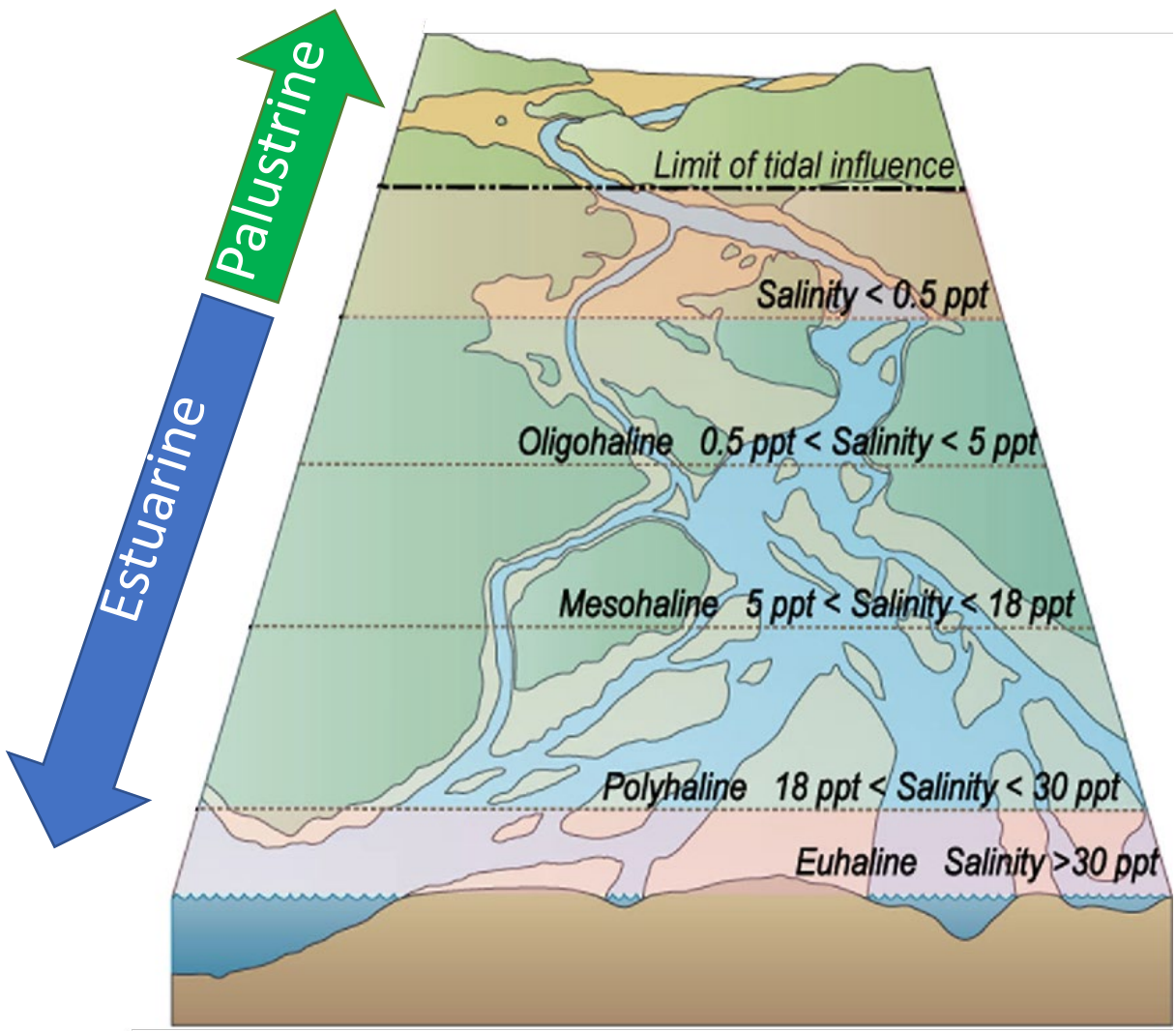
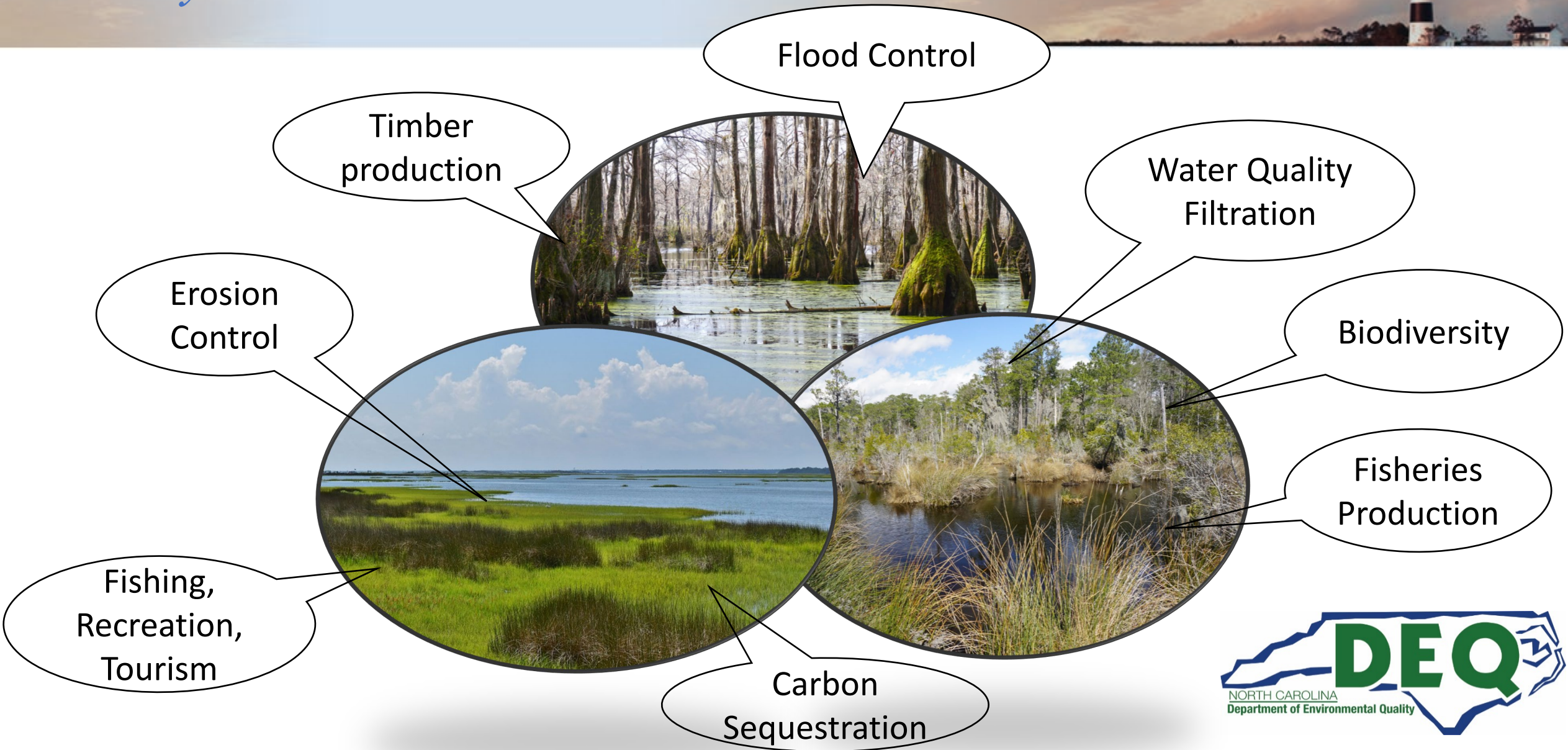


Figure Source: Adapted from Luo et al. 2017 (left); Data Source: N. Herold, NOAA C-CAP

Ecosystem Services



Ecosystem Services



Ecosystem Services

Wetland-dependent Fishery Species

Fish Guild	Species	Wetland Functions					Rank ¹	
		Nursery	Foraging	Refuge	Spawning	Corridor	C	R
<i>Resident Fresh-Brackish</i>	White perch	X			X			
	Yellow perch	X	X		X			
	Catfish	X	X	X	X	X	6	
<i>Anadromous/Catadromous</i>	American eel		X	X		X		
	River herring	X	X	X	X	X		
	Striped bass	X	X	X		X		
<i>Estuarine/Inlet Spawning and Nursery</i>	Blue crab	X	X	X		X	1	
	Cobia	X	X			X		
	Red drum	X	X	X		X		3
	Spotted seatrout	X	X	X		X		1
<i>Marine Spawning, Low-High Salinity Nursery</i>	Atlantic croaker	X	X	X		X	5	7
	Atlantic menhaden	X	X			X		
	Shrimp	X	X	X		X	2	
	Southern flounder	X	X	X		X	9	4
	Spot	X	X	X		X		8
	Striped mullet	X	X	X		X	4	
<i>Marine Spawning, High Salinity Nursery</i>	Black sea bass	X	X	X		X		10
	Summer flounder	X	X	X		X	3	4

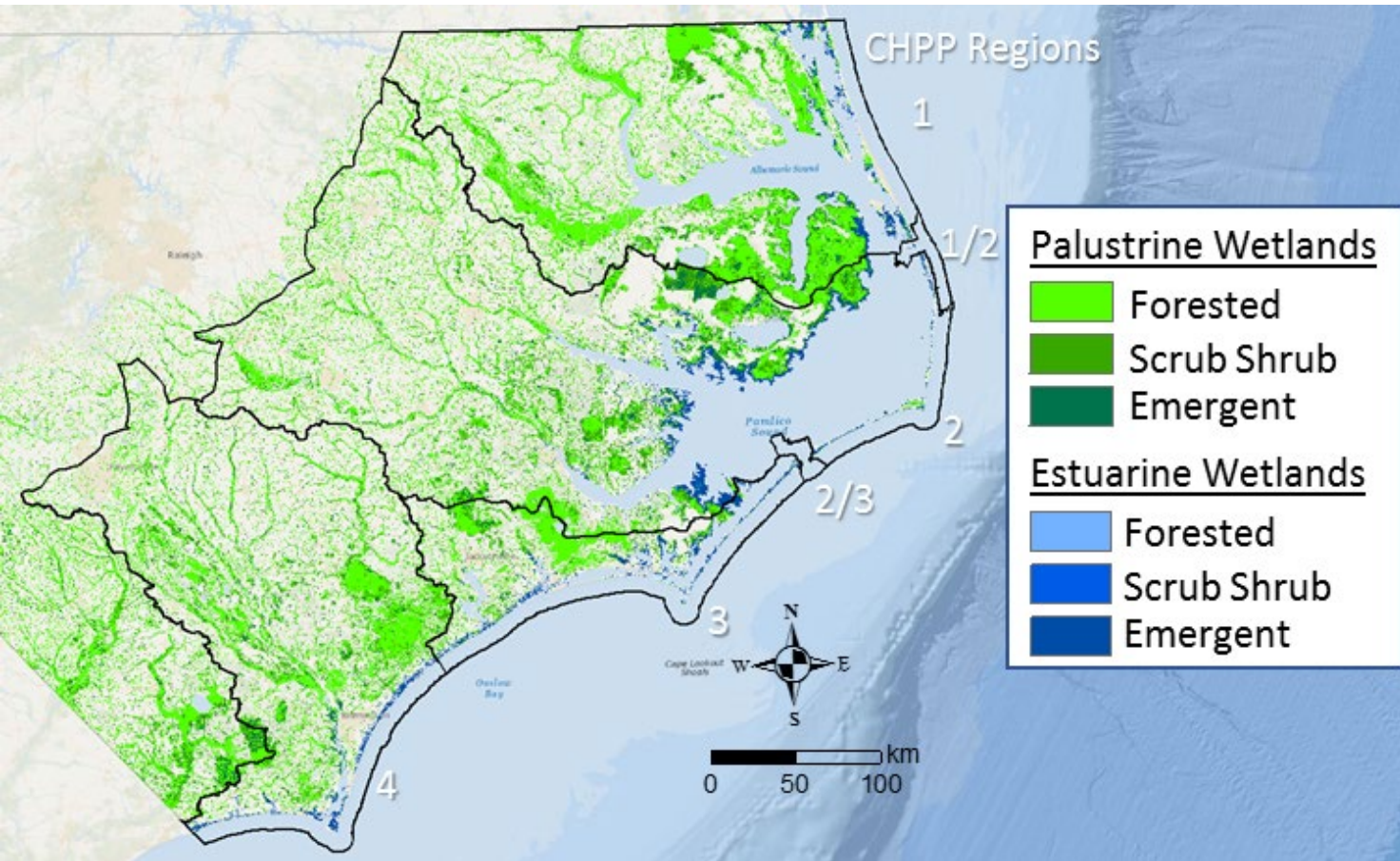
¹ 2019 rankings: C = commercial rank by pounds landed; R = recreational rank by number of directed trips; bolded species are in top 10 recreational or commercial landings. DMF data, License and Statistics Section



Together commercial and recreational fisheries support industries valued at ~ \$3.4 – 4.8 billion



Coastal Wetlands Distribution



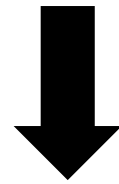
Coastal Wetland Class	Acres (2016)	% of P or E Class	% All Coastal Wetlands
Palustrine Forested Wetland	3,069,690	70.5%	66.8%
Palustrine Scrub/Shrub Wetland	1,008,552	23.2%	22.0%
Palustrine Emergent Wetland	272,932	6.3%	5.9%
Estuarine Forested Wetland	166	0.1%	0.0%
Estuarine Scrub/Shrub Wetland	7,747	3.2%	0.2%
Estuarine Emergent Marsh	235,425	96.7%	5.1%
Total Wetlands	4,594,513		100.0%



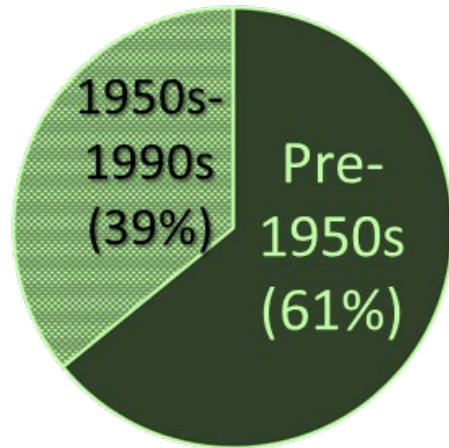
Trends Over Time

Historic Losses

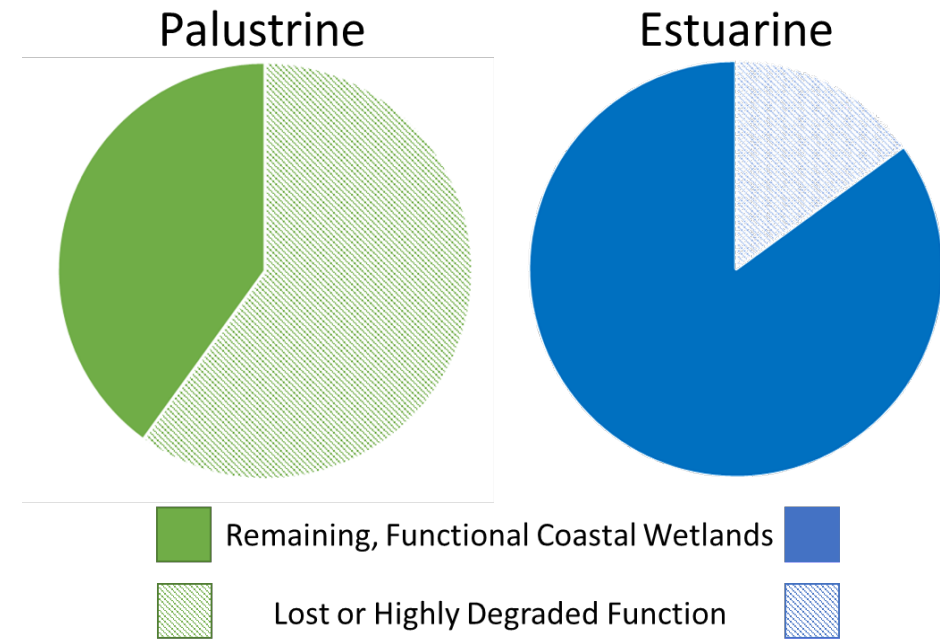
58% loss of NC coastal wetlands pre-Colonial times through 1990s



% Coastal Wetland Losses Pre-2000



Losses Not Evenly Distributed:



Trends Over Time

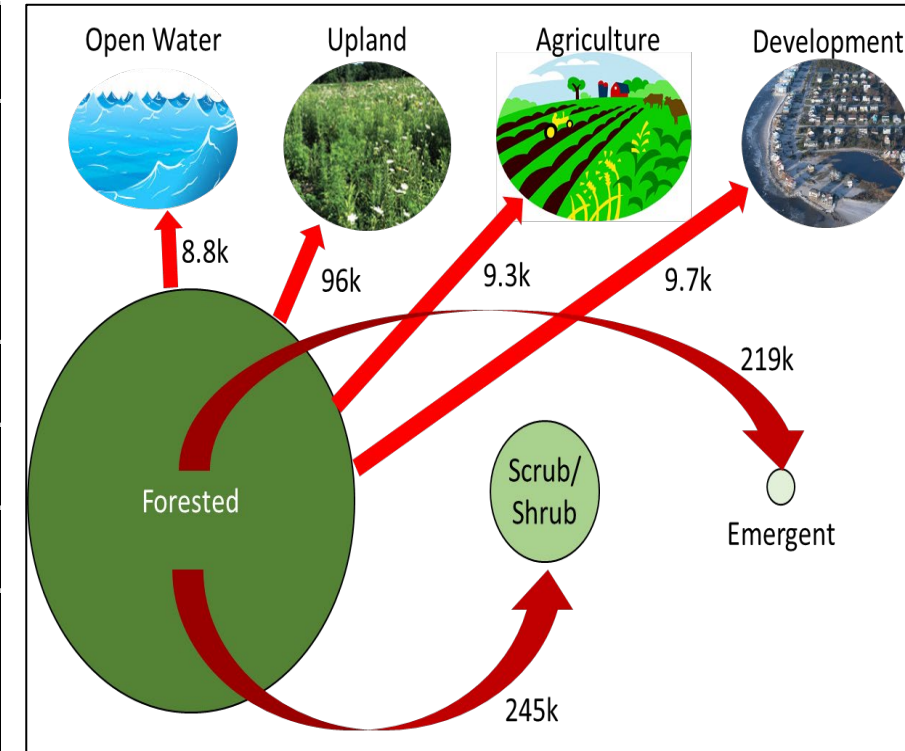
Recent Coastal Palustrine Wetland Trends (1996-2016)

Coastal Palustrine Wetland Change (acres)

Time Period	Palustrine Forested Wetland	Palustrine Scrub/Shrub Wetland	Palustrine Emergent Wetland	All Palustrine Wetland Classes
2011-2016	-42,969	40,277	5,816	3,124
2006-2011	-115,836	99,574	-265	-16,527
2001-2006	-150,287	89,661	35,664	-24,962
1996-2001	-279,324	147,607	35,204	-96,513
20-Yr Total	-588,416	377,119	76,419	-134,878

Positive value indicate net gains, Negative values indicate net losses

Palustrine Forested Losses:



Trends Over Time

Recent Coastal Estuarine Wetland Trends (1996-2016)

Time Period	Coastal Estuarine Wetland Change (acres)
2011-2016	-81
2006-2011	-63
2001-2006	2
1996-2001	590
20-Yr Total	448

Positive value indicate net gains, Negative values indicate net losses

1996-2006

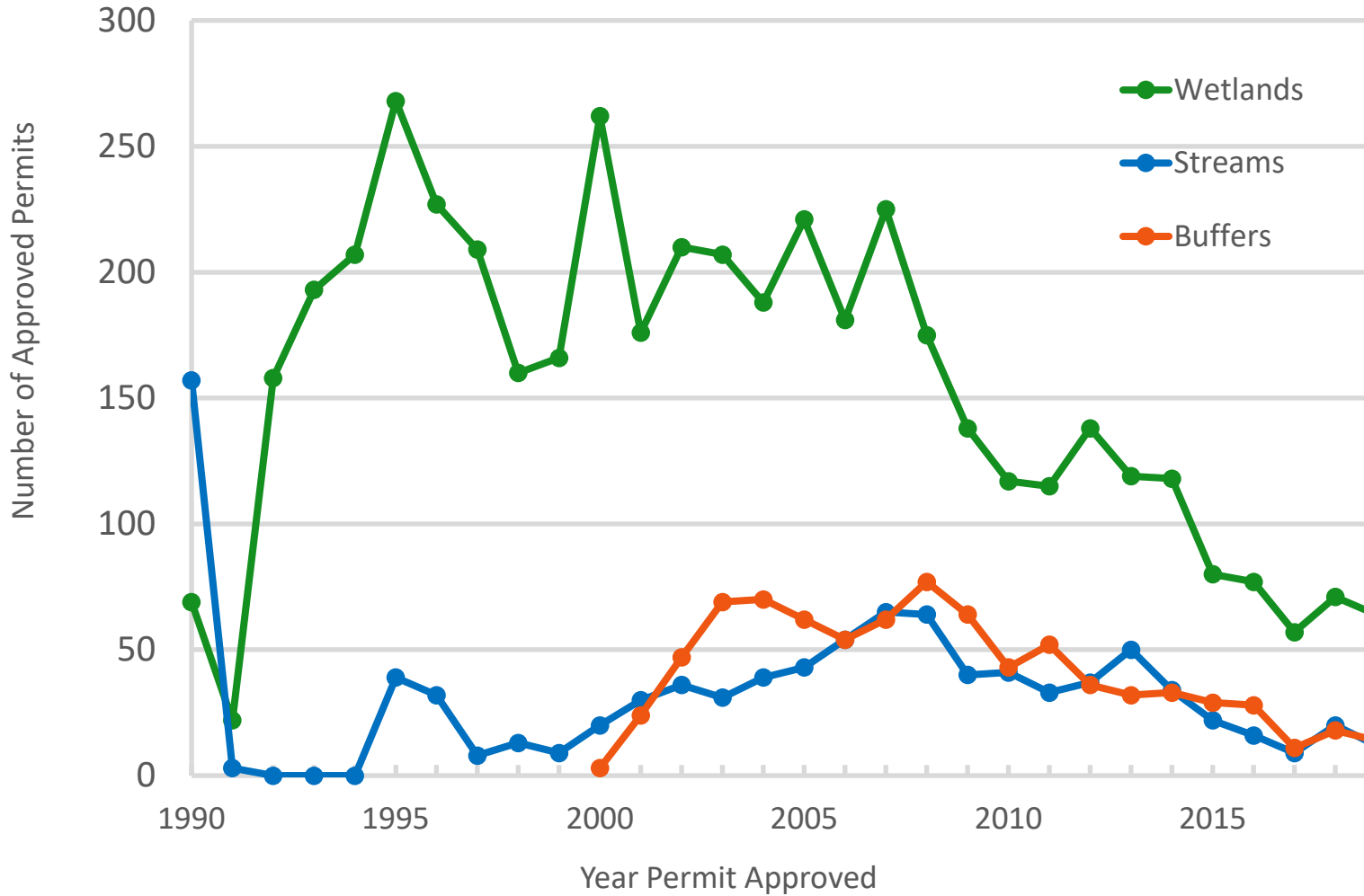


2011-2016



Current and Future Threats

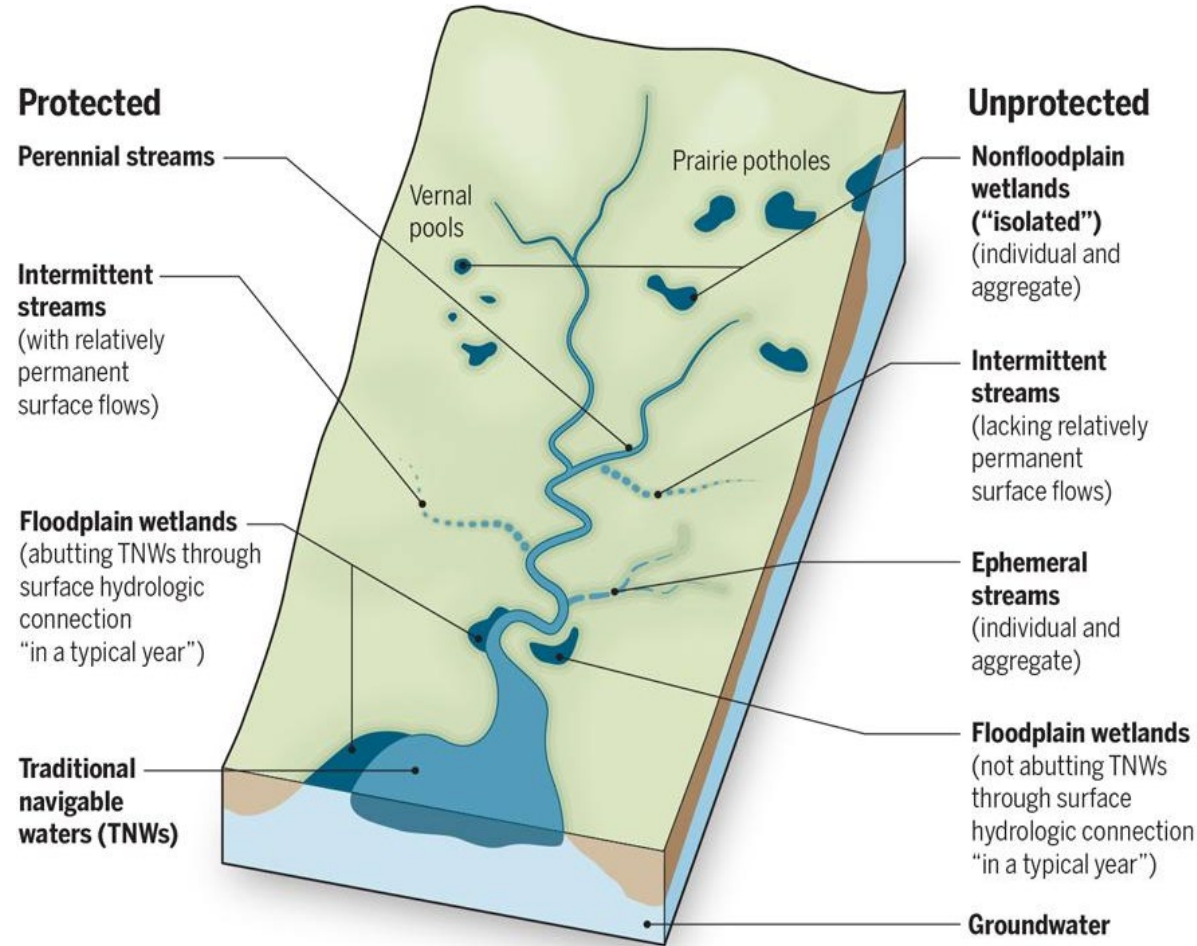
Development – Permitted Wetland Impacts



Current and Future Threats

Development - Regulatory Limitations to Wetland Protection

Waters of the United States (WOTUS) Change



Effect on Coastal Wetlands

Most impacted wetland types:

- Bottomland Hardwood Forest
- Headwater Forest
- Floodplain Pools
- Non-riverine Swamp Forest
- Pine Flats
- Bogs
- Seeps

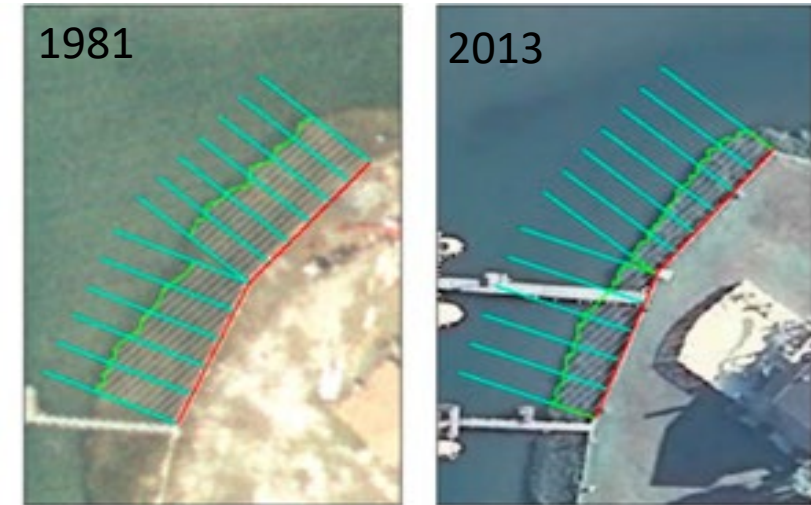
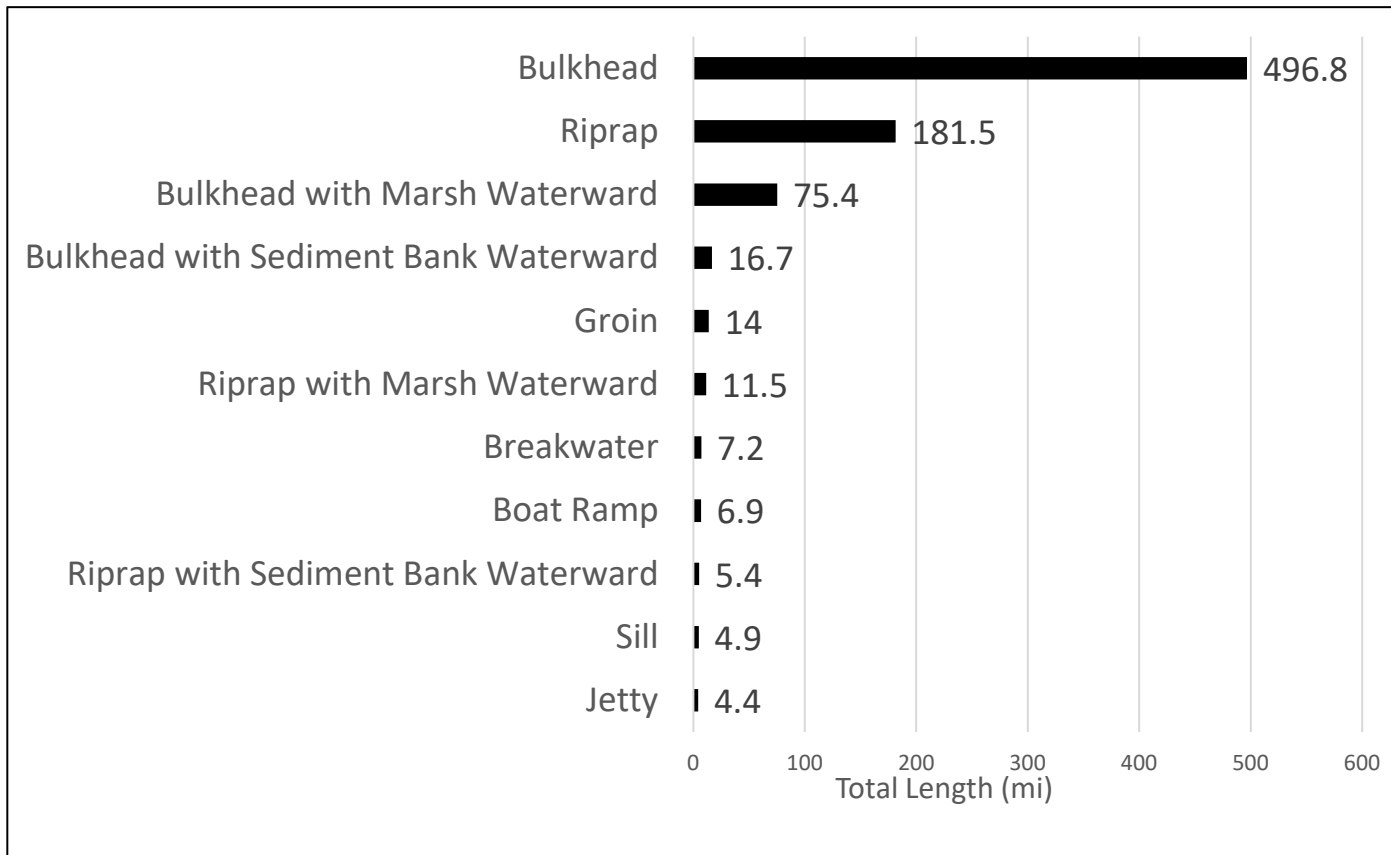


Current and Future Threats

Development – Shoreline Hardening



Structures along NC estuarine shorelines (mi)



— Landward Bulkhead
■ Marsh Area

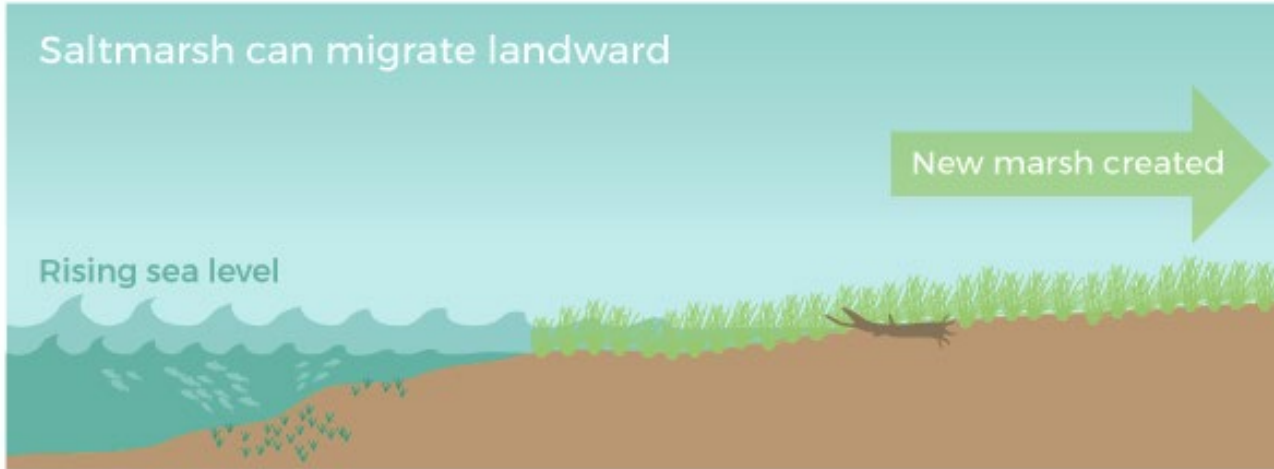


Source: DCM 2012 Shoreline Mapping Report

Image Sources: Burdick 2018 (top); NCCF (bottom)

Current and Future Threats

Climate Change and Coastal Squeeze



$$\begin{aligned} & \text{Erosion} \\ & + \\ & \text{Inundation} \\ & + \\ & \text{Inability to migrate} \\ & = \\ & \text{Marsh loss} \end{aligned}$$



Coastal Wetland Protect and Restoration

Summary

- Critical for fish, other habitats, and people
- Wetland loss continues
- Impacts are likely to increase from development and climate change
- Maps are outdated -need updating with improved resolution



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- Wetland loss continues
- Impacts are likely to increase from development and climate change
- Maps are outdated -need updating with improved resolution
- Future losses can be reduced through:
 - planning for marsh migration
 - targeted restoration where most needed
 - additional use of living shorelines
 - nature-based solutions for BMPs
 - regulatory changes





Questions?

