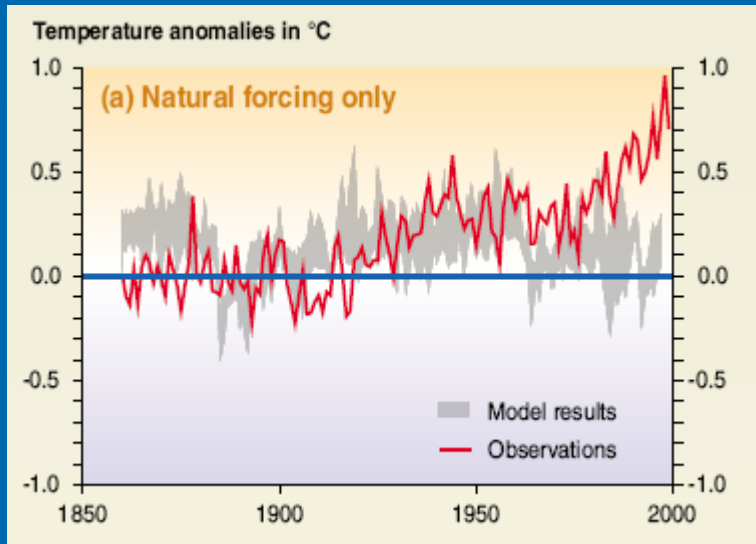


Dorchester County Sea Level Rise Inundation Study

Brought to you by:
Angie Carlisle
Caleb Conn
Steven Fabijanski

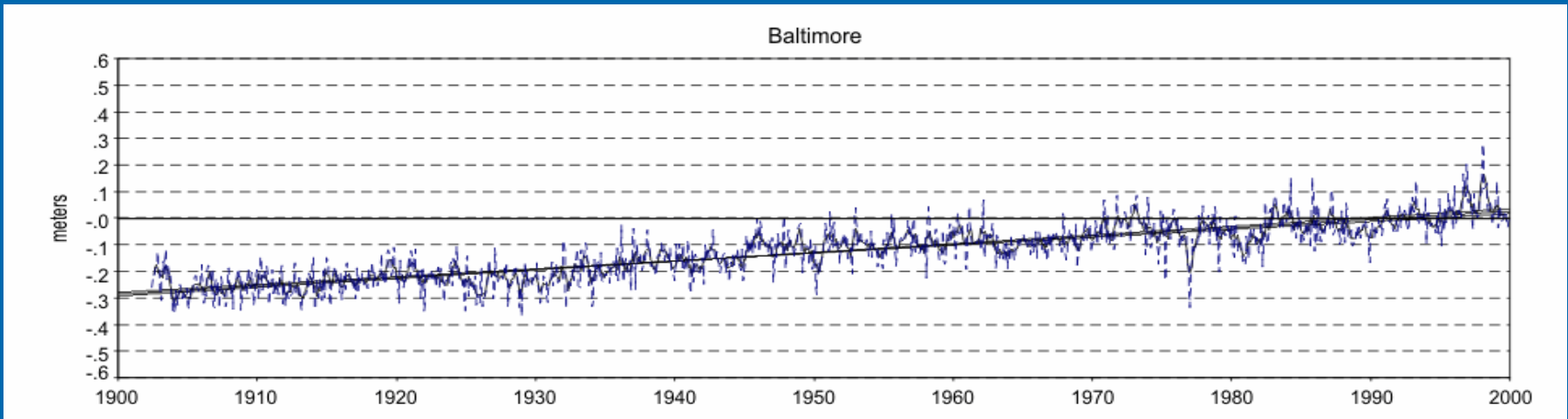
Global Warming & Sea Level Rise



- Most warming over last 50 years attributable to human activities
- Sea Level Rise (SLR) average annual rate of 1 to 2 mm
 - Thermal Expansion
 - Non-polar glacier melt
 - Polar ice sheet melt

Source: IPCC Climate Change 2001

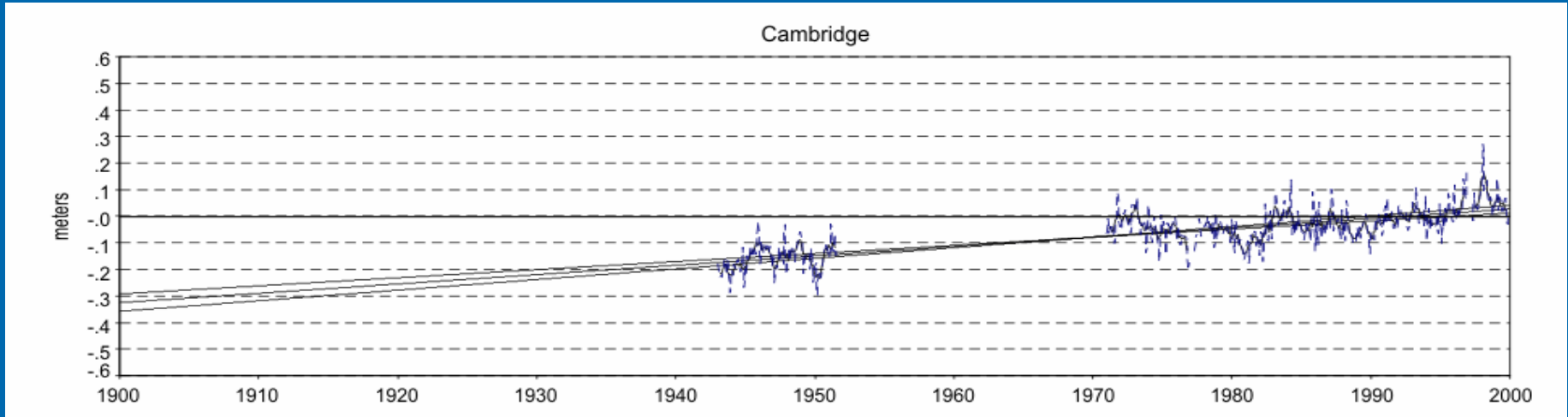
Sea Level Rise – Historical



➤ 3.12 mm/yr. (1.02 ft/century)
1902 - 1999

Source: NOAA Tides & Currents

Sea Level Rise – Historical



- 3.52mm/yr (1.15ft/century)
- 1943 - 1999

Source: NOAA Tides & Currents

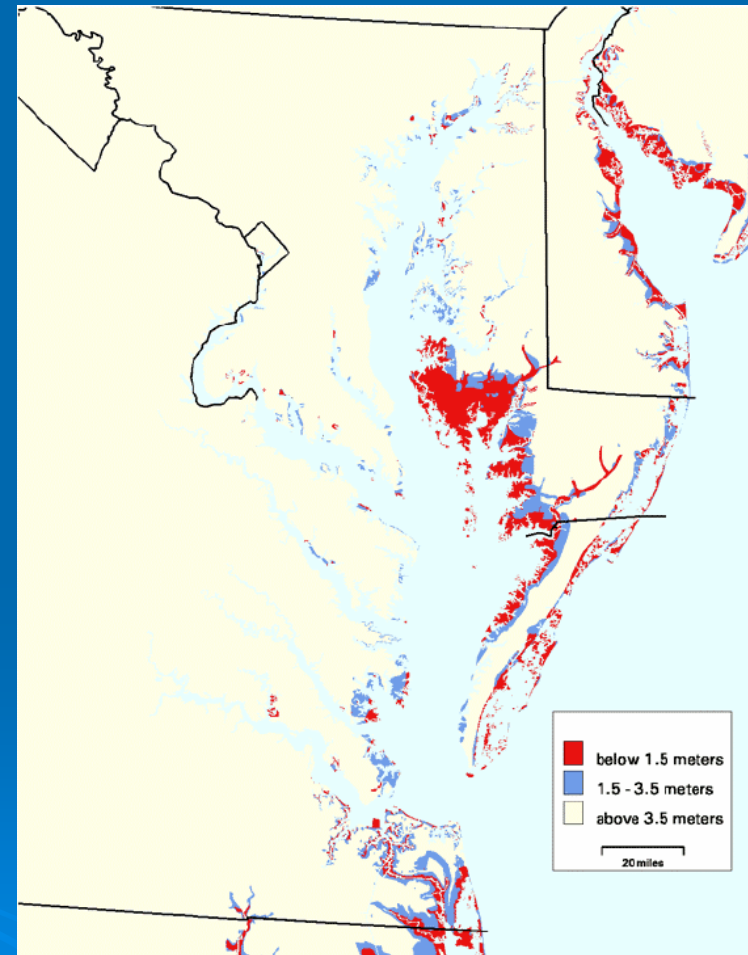
Dorchester County, Maryland

- Facts
 - Delmarva Fox Squirrel
 - 39% of state wetlands, including Blackwater Refuge



Why Dorchester?

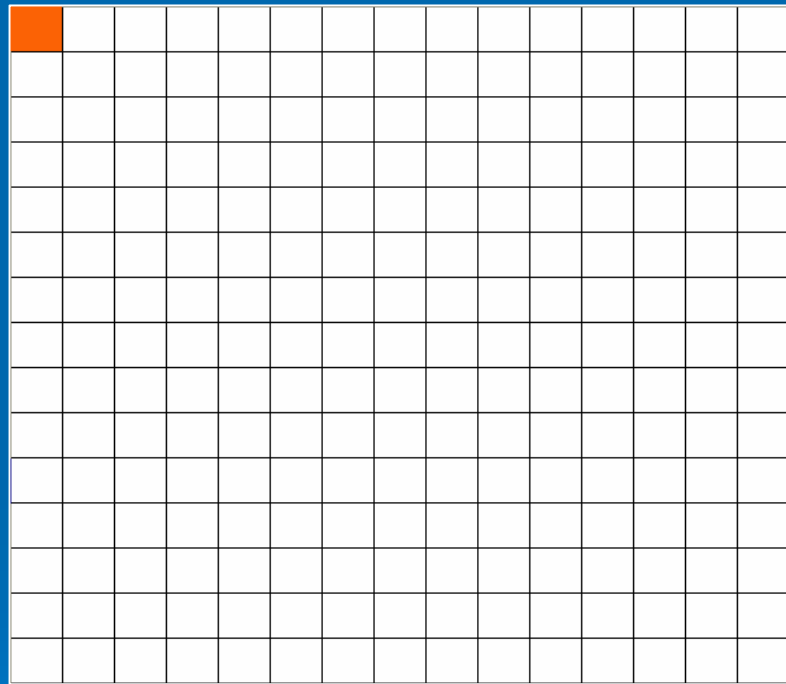
- Titus & Richman 2000, SLR
- DNR, 2000 – SLR Response Strategy
- Availability of 2 Meter LIDAR (March 2003)
- Comprehensive Plan, 2006



Picture Source: Titus & Richman 2000

LIDAR

➤ 2M versus 30M



MD Critical Area

- The MD Critical Area (CA) Program was created to protect the Chesapeake Bay through developmental regulations on or near the bay's tidal shorelines.
- "...all lands within 1000 feet of the mean high water line of tidal waters or the landward edge of tidal wetlands of the Chesapeake and Coastal Bays and their tidal tributaries."



Satellite Imagery of the Chesapeake Bay. Source: www.pwconserve.org/photo/

CA 100 Foot Buffer Zone

- 100 feet landward of the mean high water line is designated as a protected “aquatic resources” area
- Includes tidal waters, tributary streams and tidal wetlands
- Intended to protect vital plant and animal habitat
- In areas of steep slope or erodible soils the buffer may be expanded beyond 100 feet.



100 Foot Buffer. Source: www.dnr.state.md.us

Methods

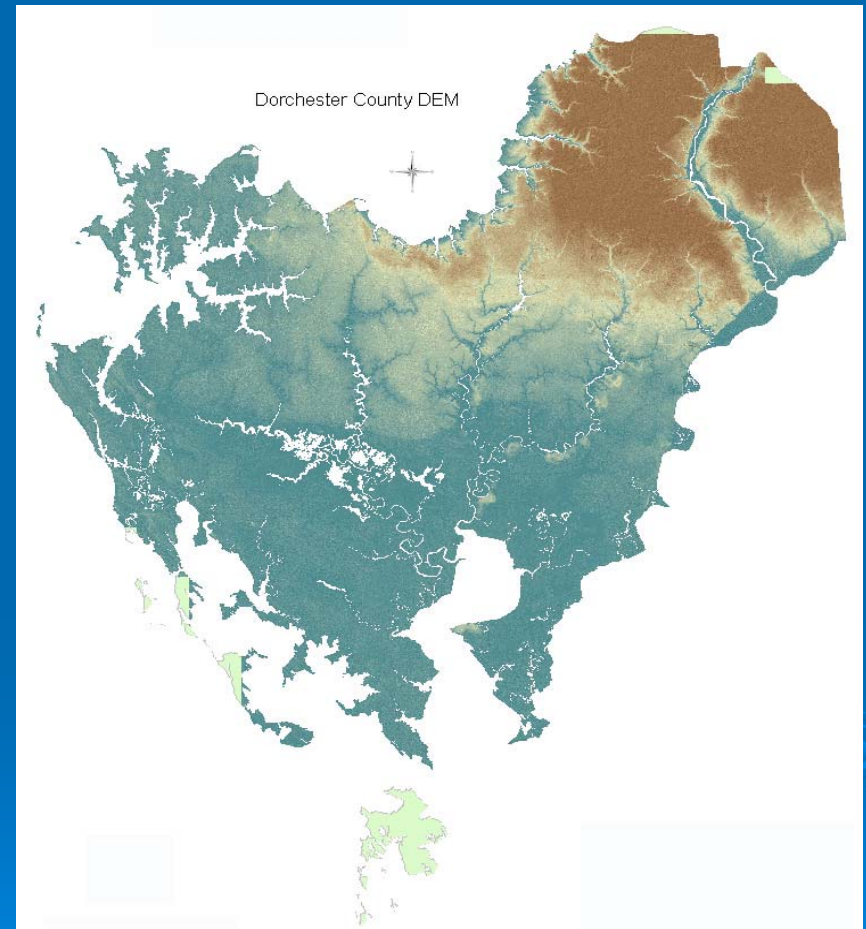
- Convert .e00 files to ESRI Grid
- Merge Grids in Arc Grid
- Convert two large Grids to Imagine files
- Merge two imagine files to one final Grid
- Reclass
 - Two scenarios
 - High (3ft/century)
 - Low (1ft/century)

SLR Modeling Scenarios

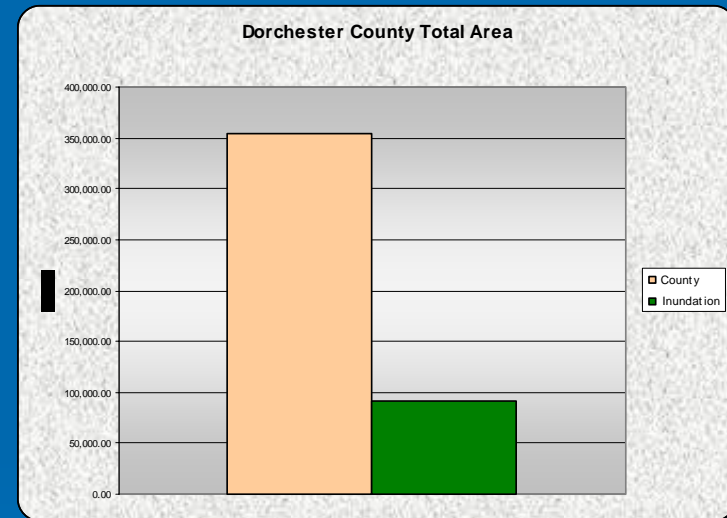
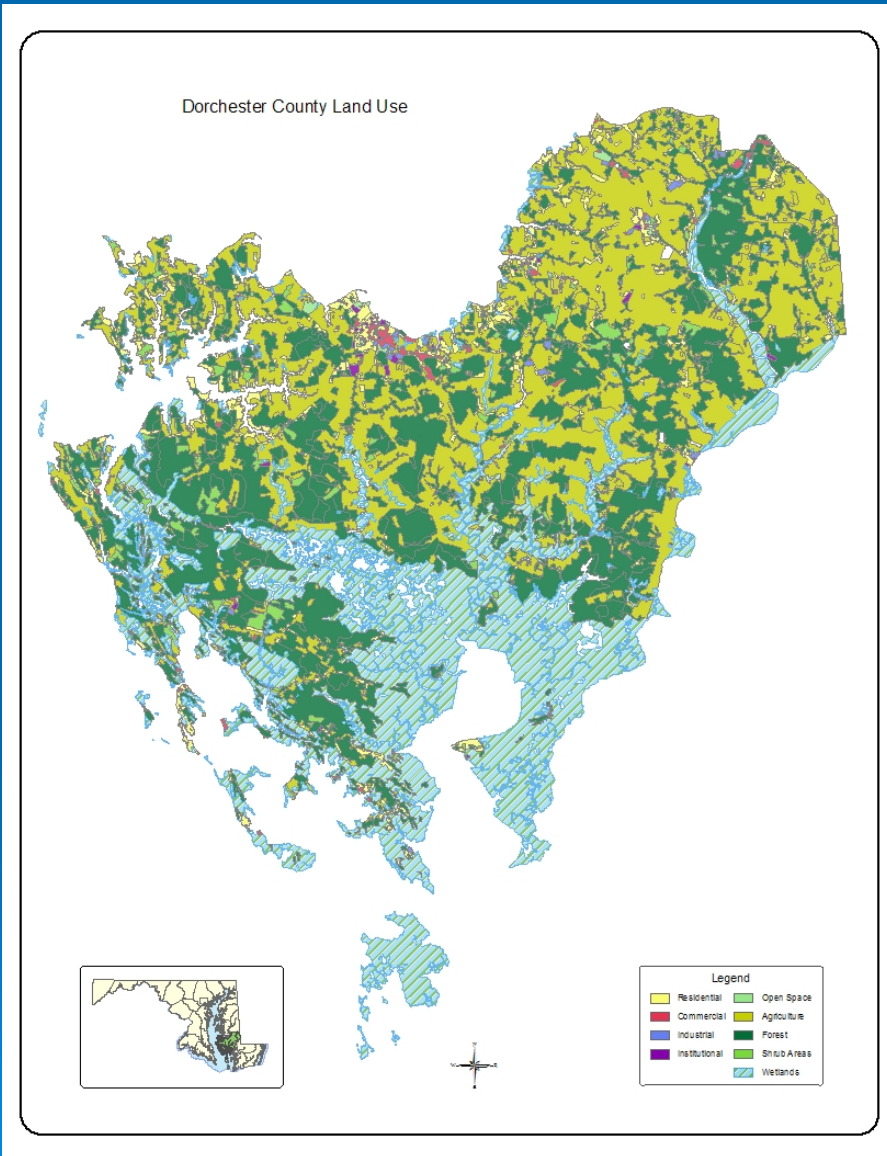
	25 Year	50 Year
Low	3 inches	6 inches
High	9 inches	18 inches

Data Generation

- Development of 1000 Foot Boundary
- Development of 100 Foot Buffer
- Cross Tabulation:
 - County-wide
 - 1000 Foot Boundary
 - 100 Foot Buffer

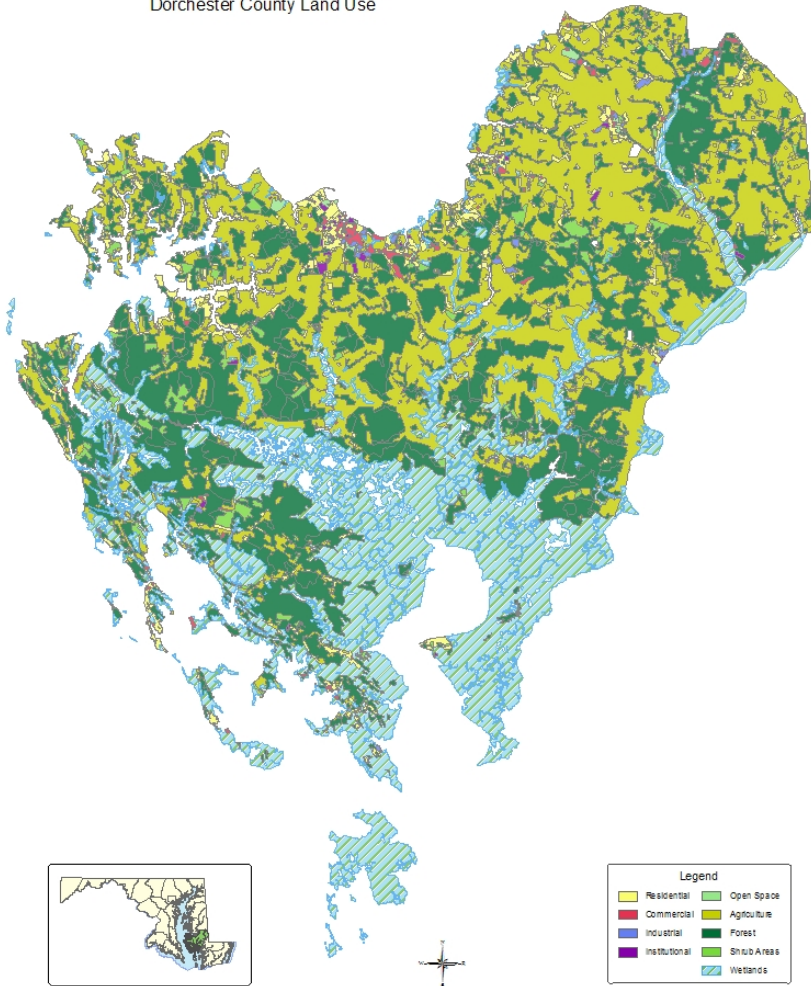


Findings

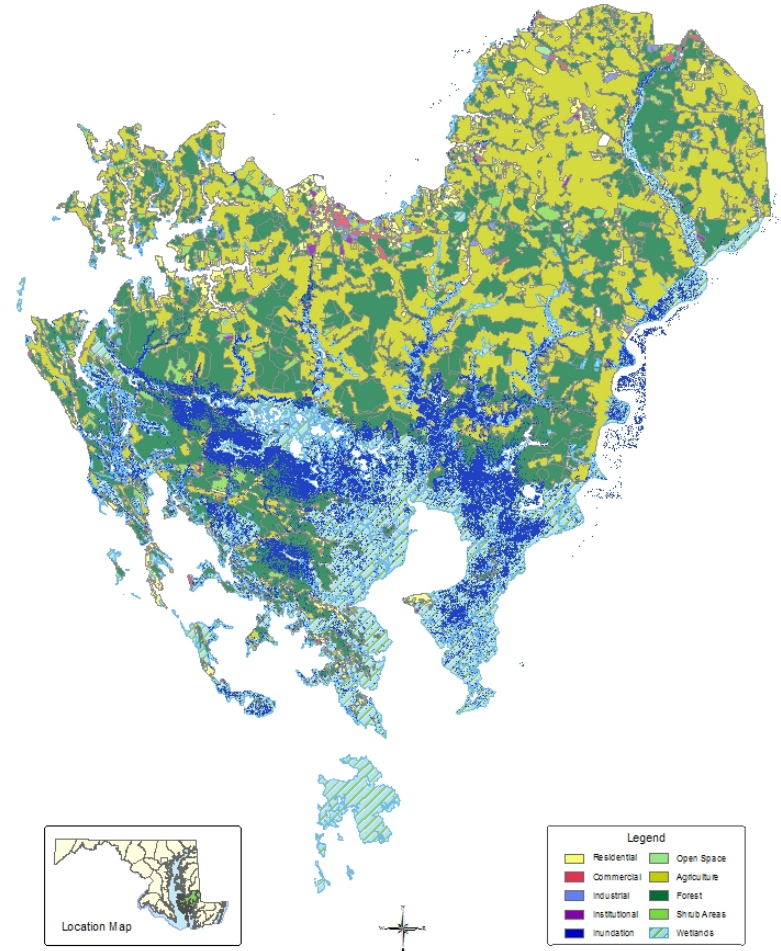


Findings

Dorchester County Land Use

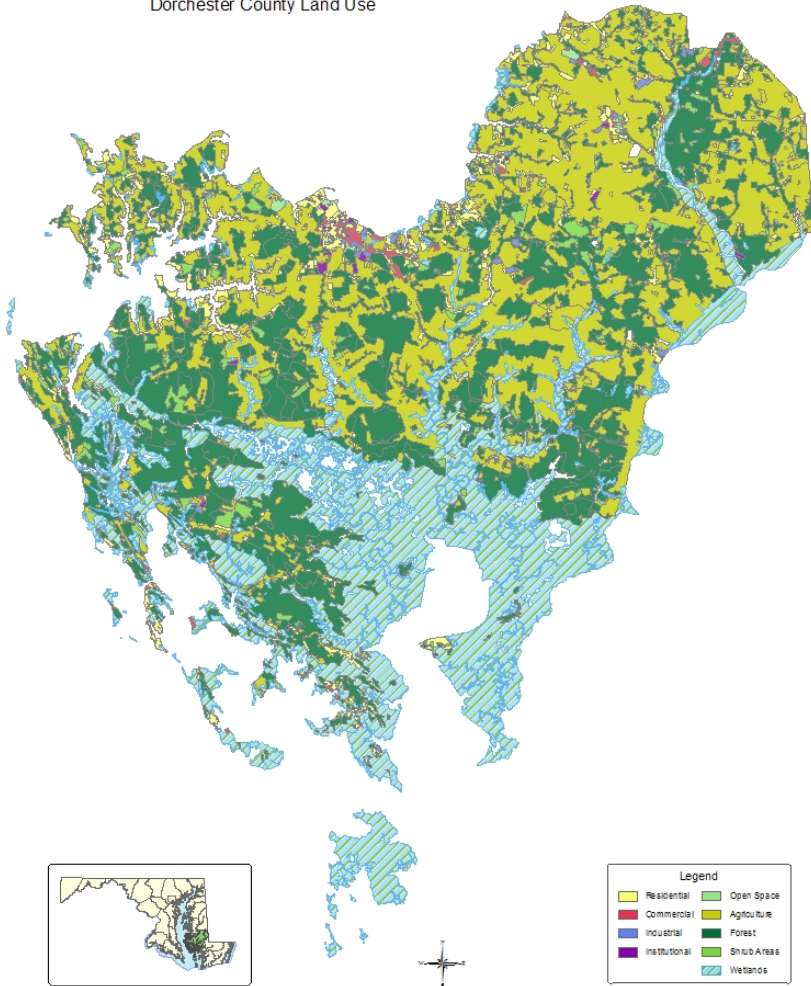


Dorchester County Land Use Inundation
Where Sea Level Rise = 9 inches in 25 years

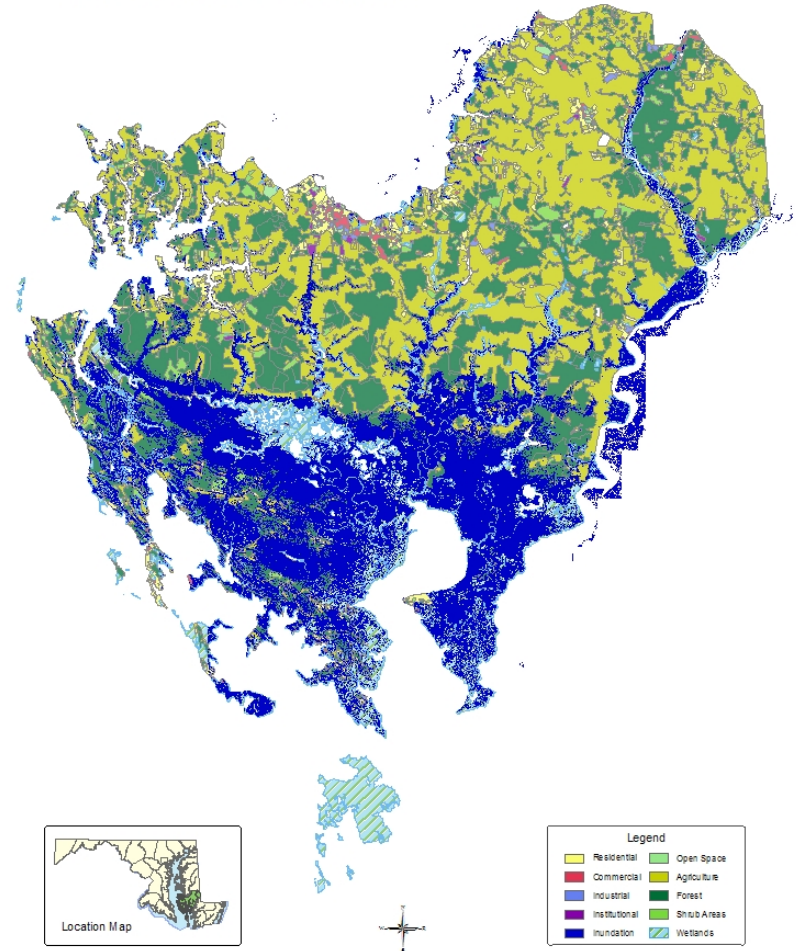


Findings

Dorchester County Land Use



Dorchester County Land Use Inundation
Where Sea Level Rise = 18 inches in 50 years

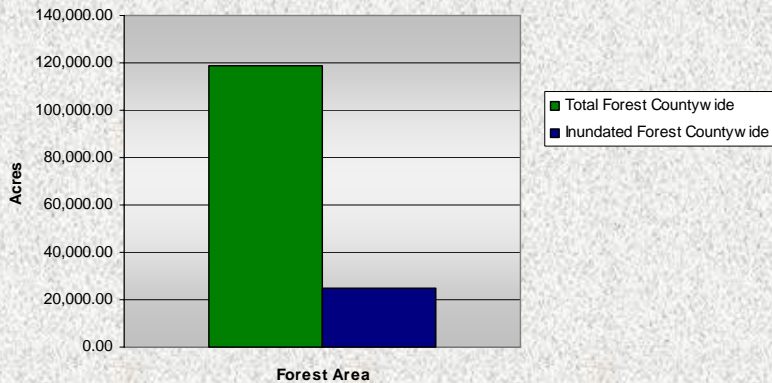


Findings

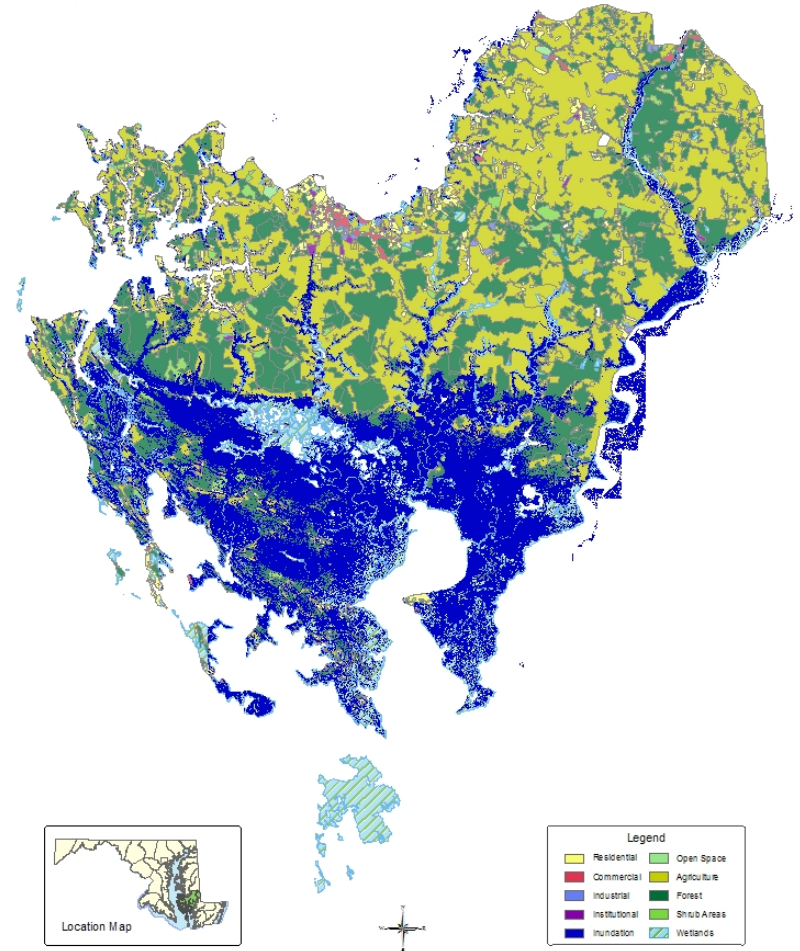
Total Affected Area Including Wetlands -- High Scenario (in Acres)

LULC	Total for County	25 Years	% Inundated	50 Years	% Inundated
Residential	12,892	143.45	1.11%	739.55	5.74%
Commercial	2,069	41.38	2.00%	125.24	6.05%
Industrial	937	8.89	0.95%	39.1	4.17%
Institutional	982	3.42	0.35%	22.94	2.34%
Open Space	662	0.75	0.11%	2.21	0.33%
Agriculture	119,817	1,124.03	0.94%	4,403.33	3.68%
Forest	118,717	8,737.43	7.36%	24,932.57	21.00%
Shrub Areas	7,999	310.59	3.88%	1,113.75	13.92%
Wetlands	91,002	29,314.11	32.21%	59,708.07	65.61%
Totals:	355,076	39,684.05	11.18%	91,086.76	25.65%

Countywide Inundated Forest Areas Where SLR = 18" in 50 Years



Dorchester County Land Use Inundation
Where Sea Level Rise = 18 inches in 50 years

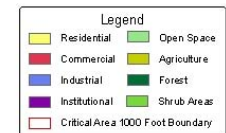
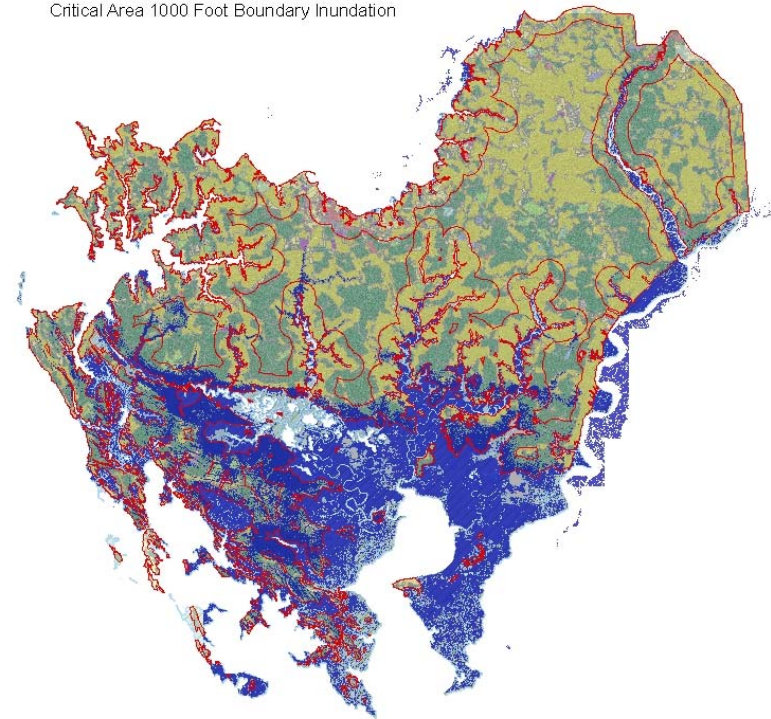


Findings

Total Affected Area Within 1000 Ft Critical Area -- High Scenario (in Acres)

LULC	Total for County	25 Years	% Inundated	50 Years	% Inundated
Residential	9,781	142.45	1.46%	732.26	7.49%
Commercial	1,577	41.16	2.61%	125.16	7.94%
Industrial	540	8.98	1.66%	39.16	7.25%
Institutional	567	3.37	0.59%	21.74	3.84%
Open Space	393	0.76	0.19%	2.23	0.57%
Agriculture	69,077	1,022.40	1.48%	3,900.50	5.65%
Forest	75,446	8,348.53	11.07%	23,322.92	30.91%
Shrub Areas	5,016	306.74	6.12%	1,062.14	21.18%
Totals	162,397	9,874	6.08%	29,206	17.98%

Dorchester County Land Use And
Critical Area 1000 Foot Boundary Inundation



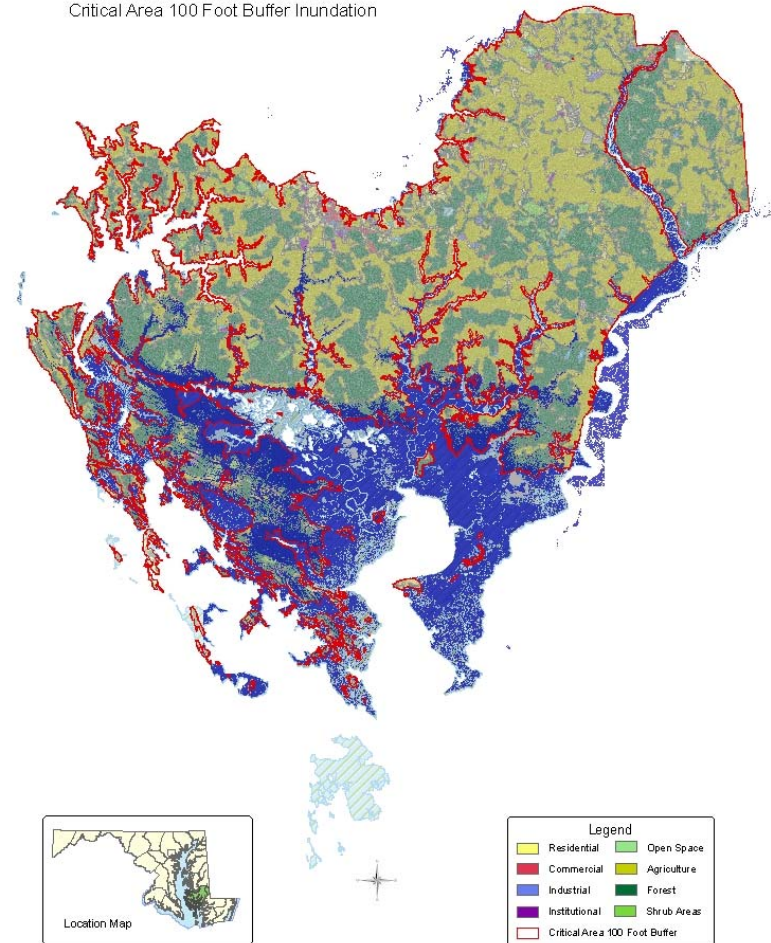
May 2006
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Findings

Total Affected Area Within 100 Ft Buffer -- High Scenario (in Acres)

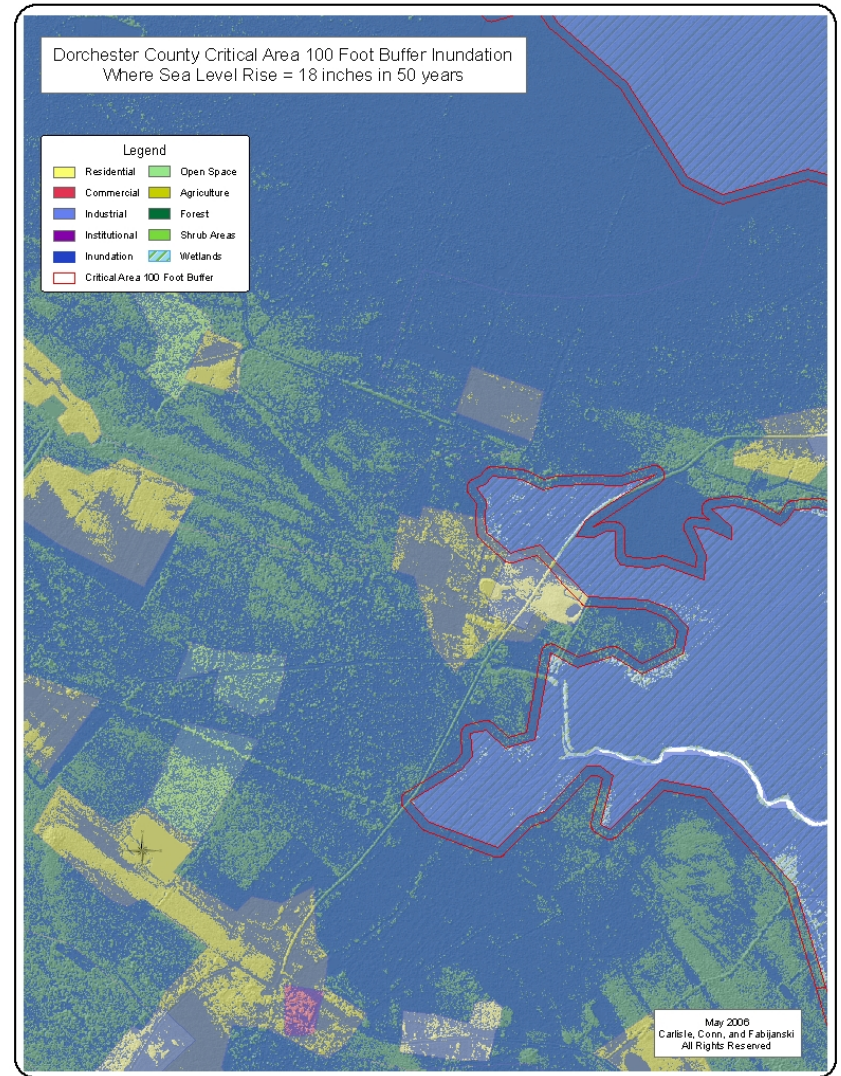
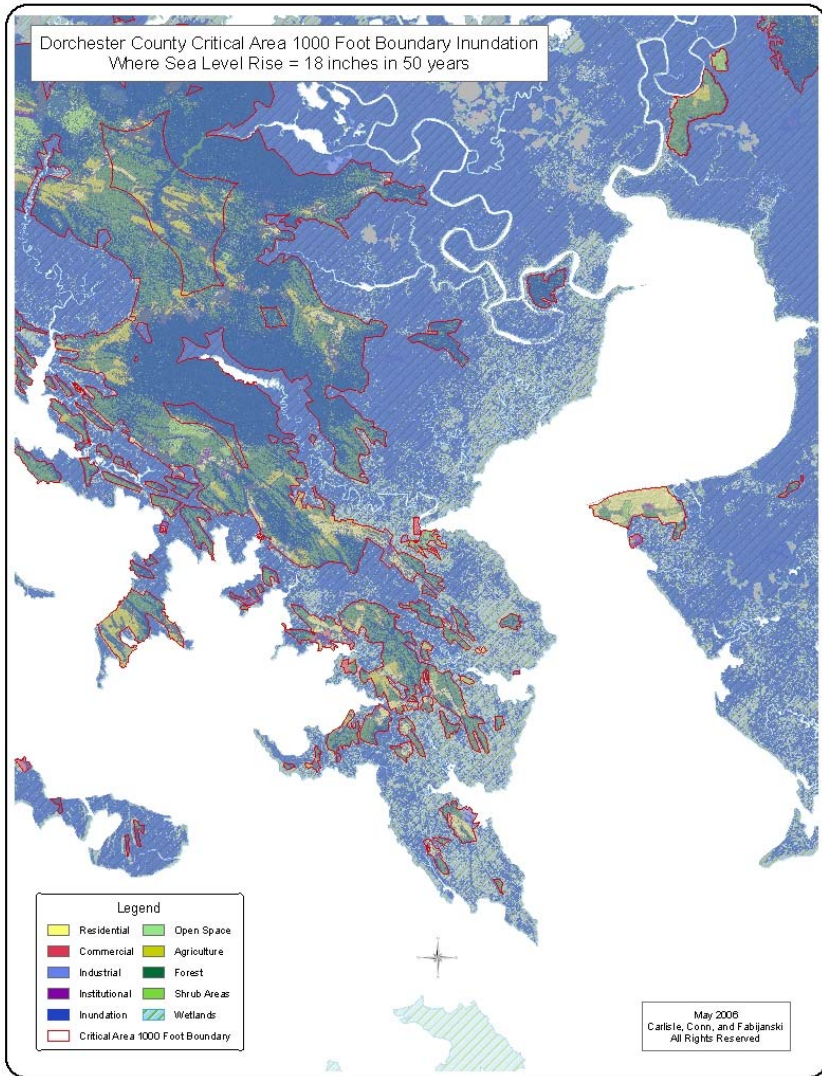
LULC	Total for County	25 Years	% Inundated	50 Years	% Inundated
Residential	1,109	66.19	5.97%	226.8	20.46%
Commercial	171	13.18	7.70%	34.99	20.43%
Industrial	46	3.96	8.59%	13.44	29.15%
Institutional	28	1.03	3.73%	4.66	16.86%
Open Space	16	0.41	2.53%	0.74	4.57%
Agriculture	4,404	327.44	7.44%	891.56	20.25%
Forest	5,604	1,153.72	20.59%	2,910.38	51.93%
Shrub Areas	358	50.8	14.21%	141.03	39.44%
Totals:	11,735	1,617	13.78%	4,224	35.99%

Dorchester County Land Use And
Critical Area 100 Foot Buffer Inundation



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Findings



Limitations of Data

- **DEM and shoreline**
- **County boundary and new shoreline**
- **Maryland Department of Planning Land Use**
- **Findings are valid for general purposes**



Recommendations

Technical Recommendations:

- Complete LIDAR dataset
- Develop current shoreline data
- Develop current land use based on high resolution aerial photography
- Updated Critical Area 1000 Foot Jurisdictional Boundary

Further information:

- Strategies of sea level rise impact mitigation:
<http://shorelines.dnr.state.md.us/>

50 Year High Scenario

