Changes in Zostera marina distribution: A GIS analysis

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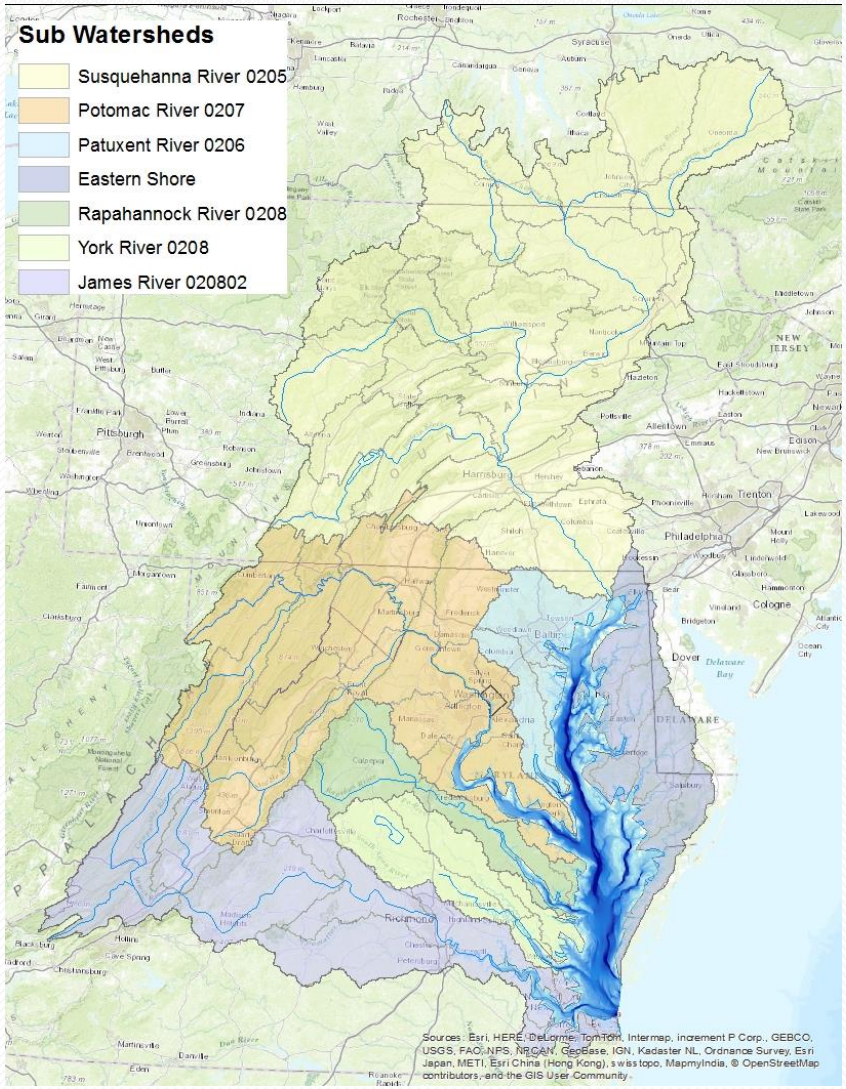
Chesapeake Bay Watershed



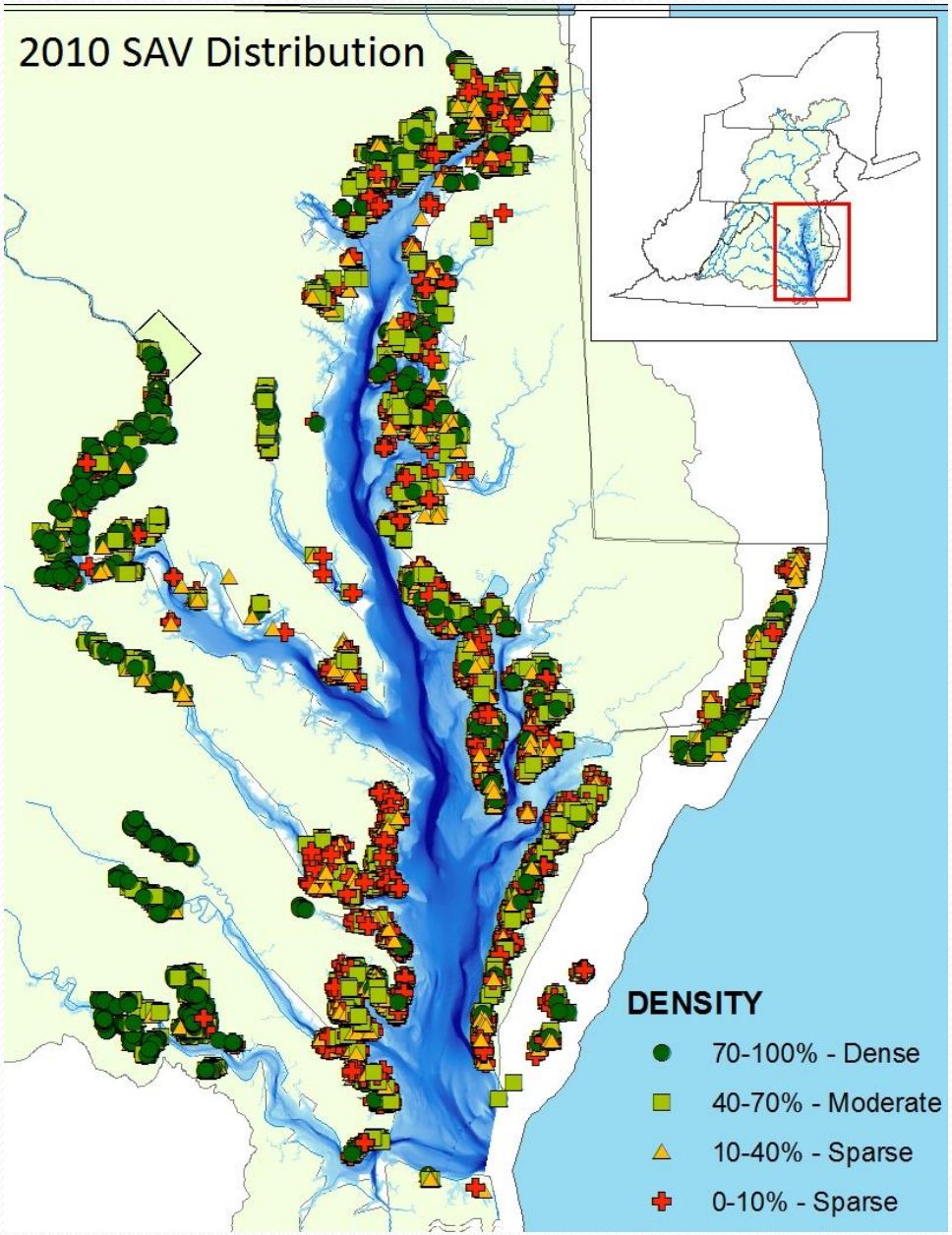
- Home to more than 17 million people
- Includes parts of 6 states & DC
- Surprisingly shallowSusquehanna River provides almost 50% of the fresh water
- Nearly 80,000 acres of bay grasses grow in the shallows of the Bay

Zostera marina (eelgrass)

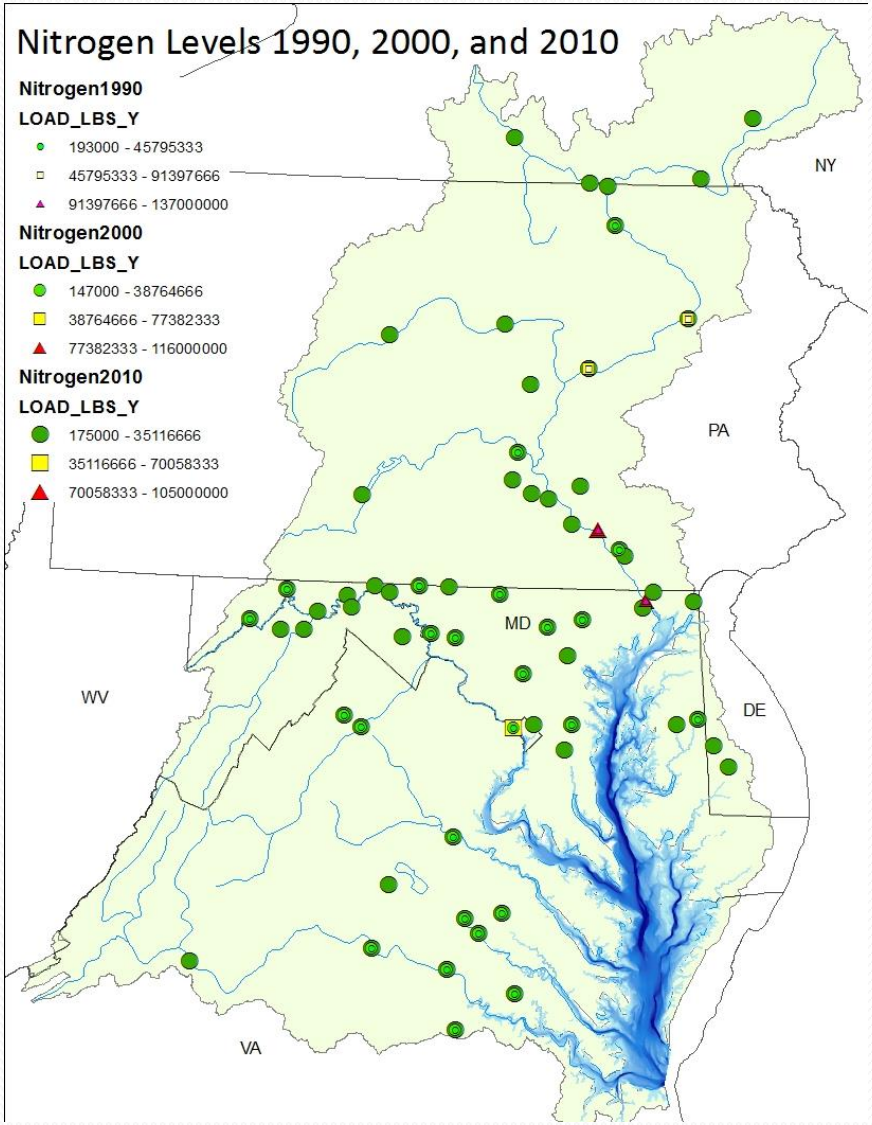
- Dominant grass in the Bay
- Meadows act as buffers which filter runoff & pollution
- Aid in nutrient cycling & allow sediment to settle
- Best barometer of water quality

Map Development

- Certain years of data not collected or available
- More data available as awareness increased

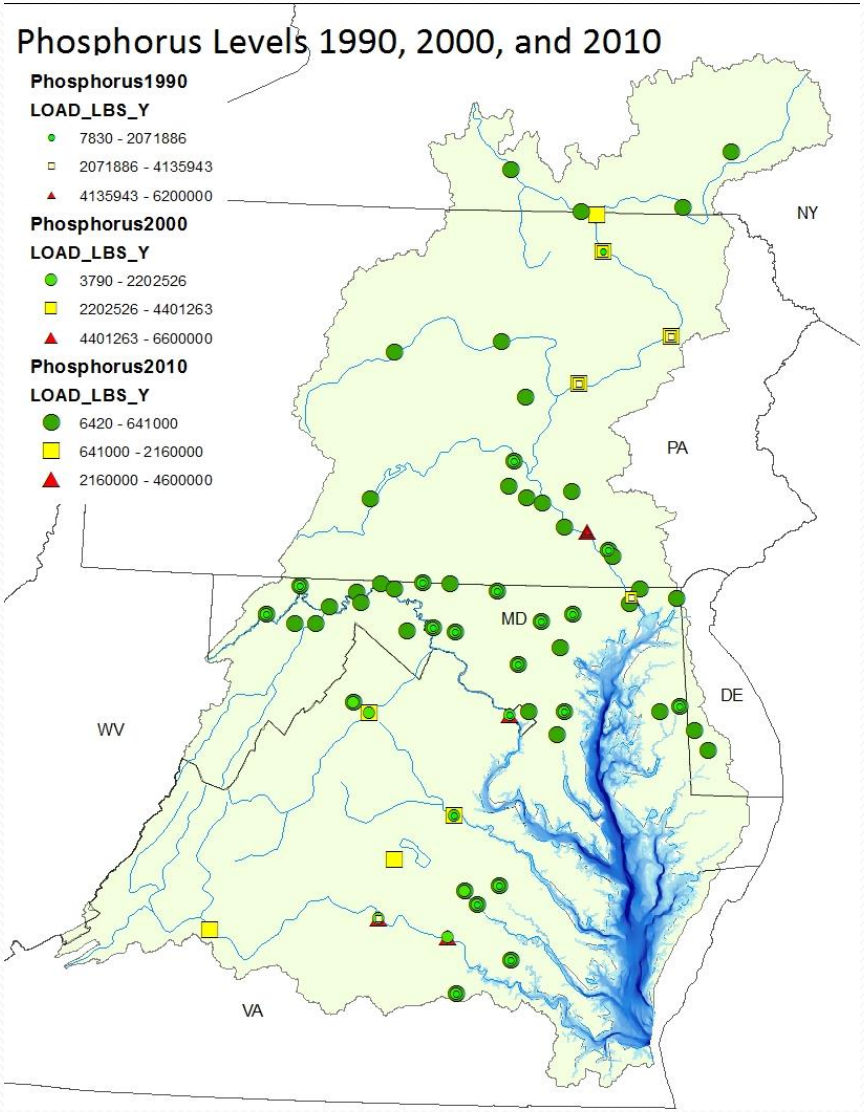


Nitrogen



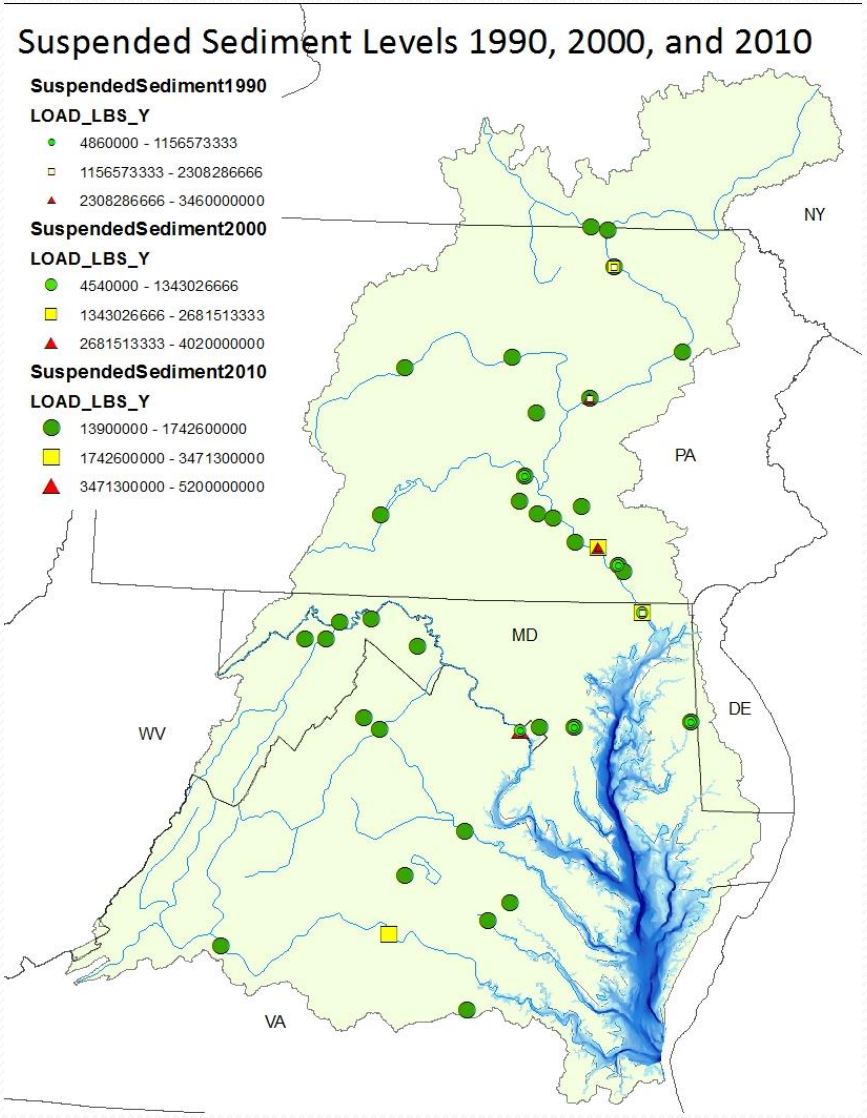
- ~600 million lbs reaches the Bay annually
- Land use changes
- Largest source is agriculture
- Fastest growing source is polluted runoff
- Urban/suburban vs agriculture & sewage treatment plants

Phosphorus

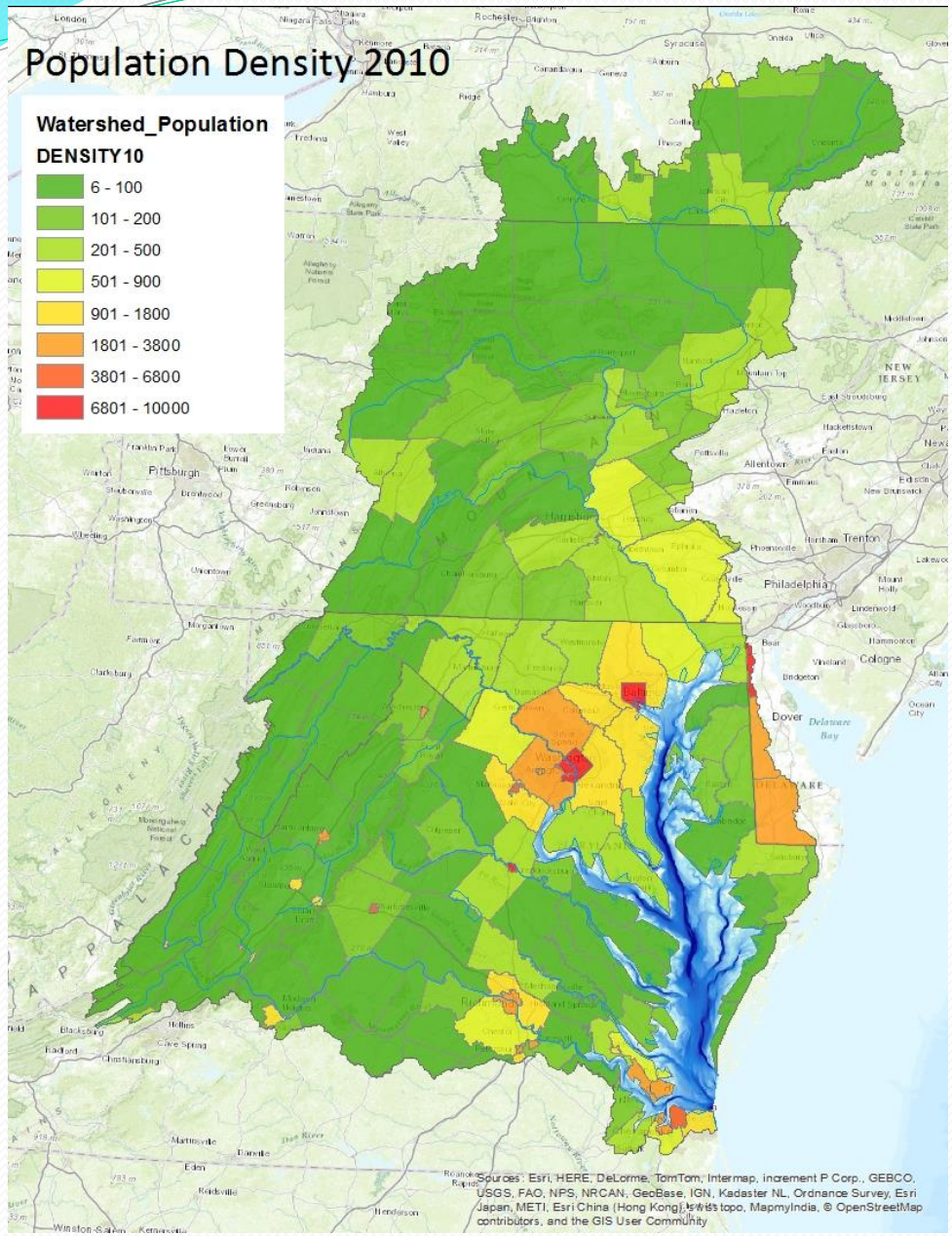


- Along with nitrogen, feed algal blooms which block sunlight
- Largest source is agriculture runoff
- Upgrading sewage treatment plants

Sedimentation



- Watershed sources
- Tidal sources
- Accumulation of sediment in the Bay
- Suspended sediments
- Nutrients and chemical contaminants can bind with sediments
- Loss of 100 acres of forest/day to development



Population Growth

- Almost 70% of watershed population live in Maryland & Virginia
- 30% of recent growth in Delaware and Virginia has been due to domestic and international migration

Anthropogenic impacts

- Increased impervious surfaces
- Increased use of pesticides and fertilizers
- Increased nutrient loads & accidental toxic pollutants
- Hardening of coastlines, docks, & boat traffic
- Hampering of restoration efforts

References & Resources

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Chesapeake Bay Program
A Watershed Partnership

United States Environmental Protection Agency

United States Census Bureau

National Oceanic and Atmospheric Administration
NOAA
U.S. Department of Commerce

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