Coastal Geomorphology: Change and Threats

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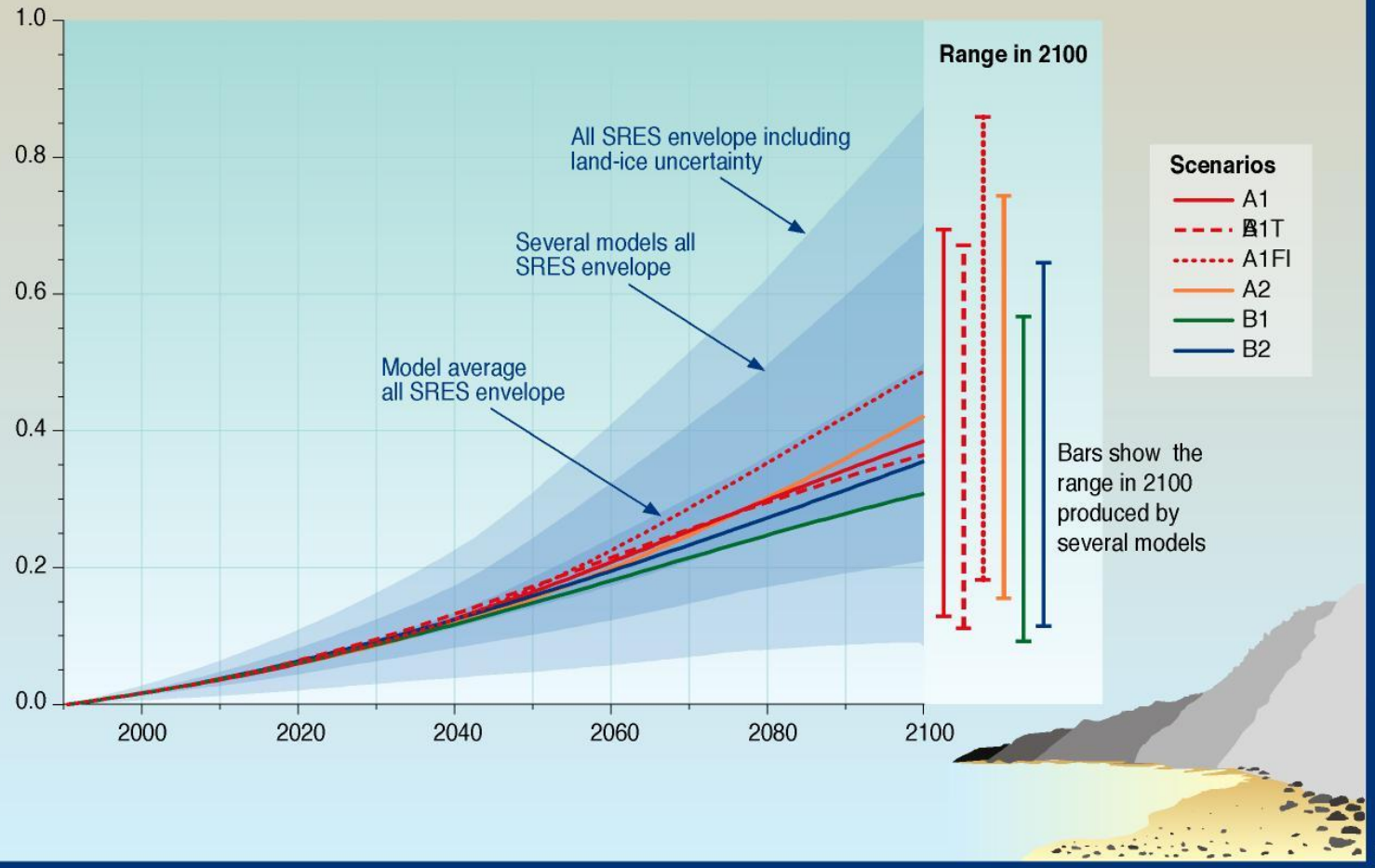
Global average sea level rise (1990 - 2100)
for the six SRES Scenarios



WG1 TS FIGURE 24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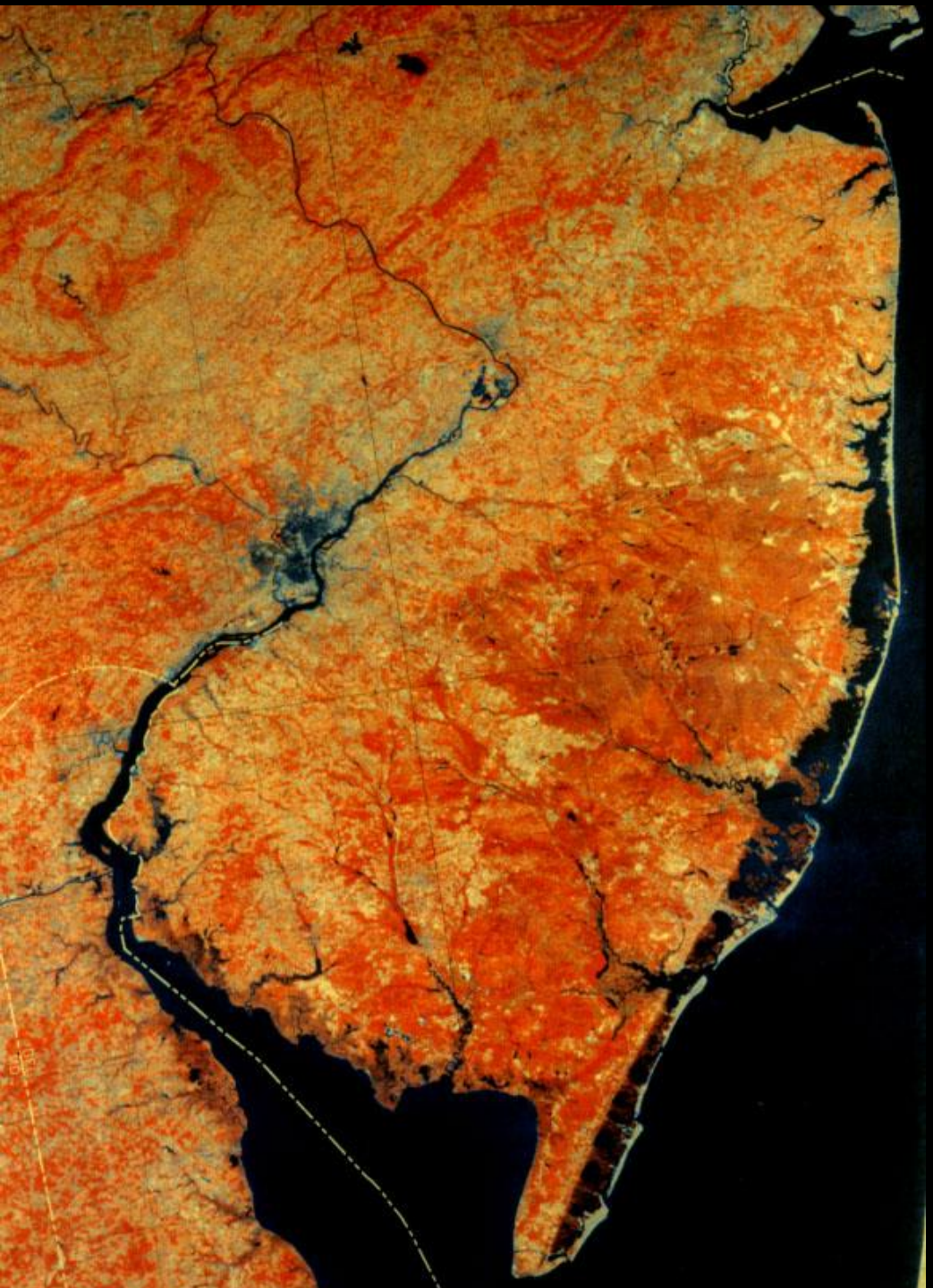

Coastal Diversity

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Barrier Islands and Headlands

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Coastal Watersheds

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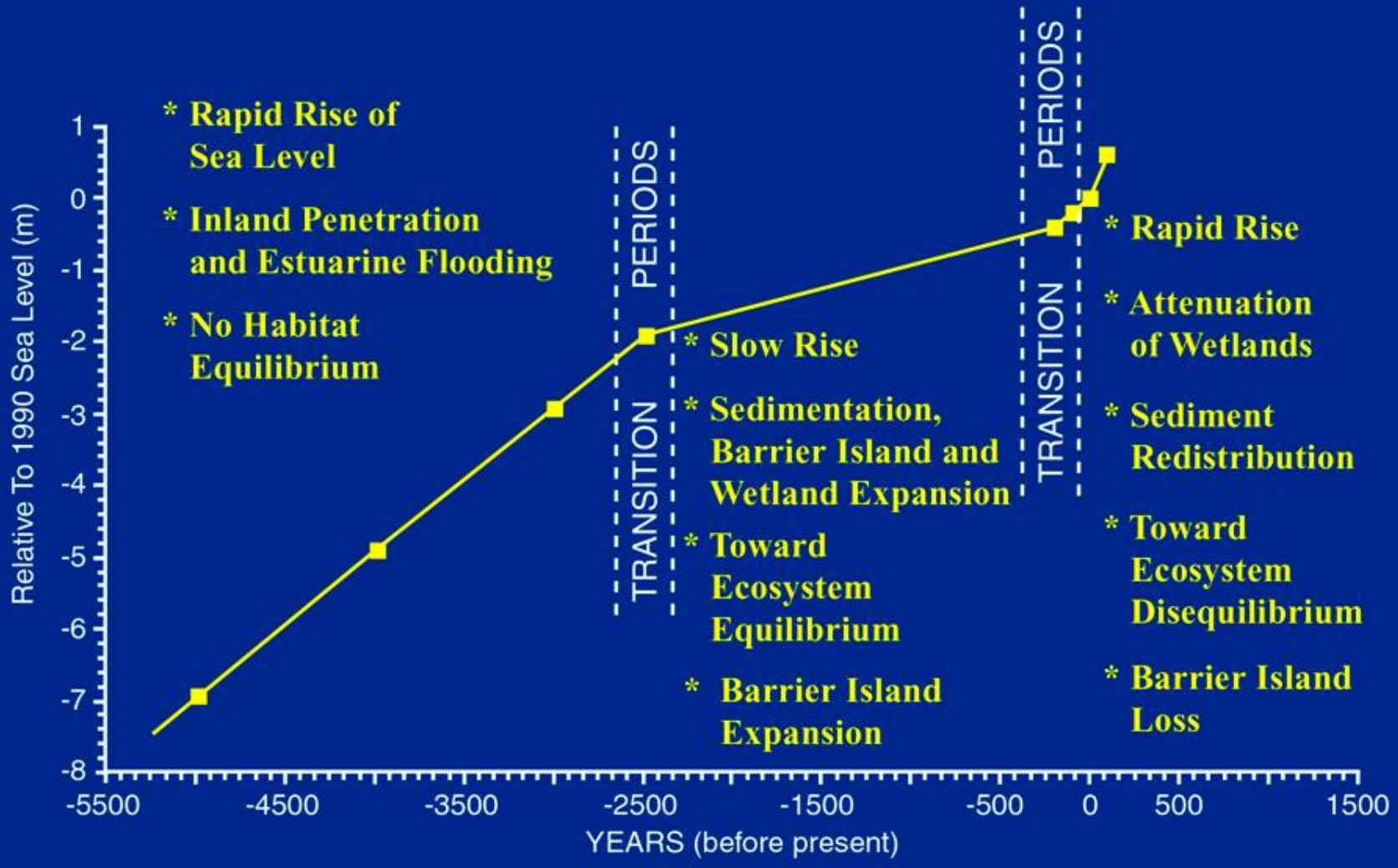
Recent Geological Context



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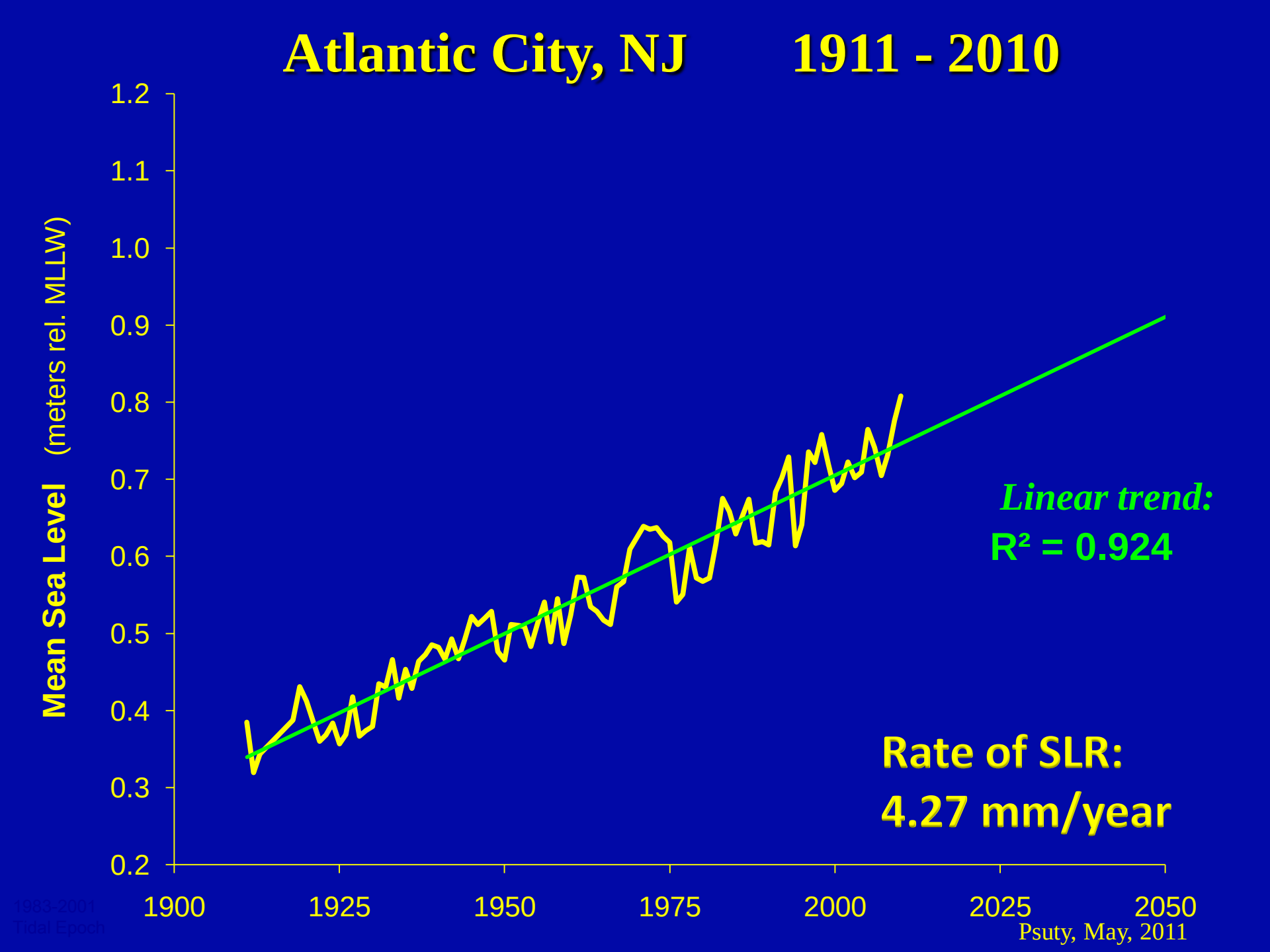
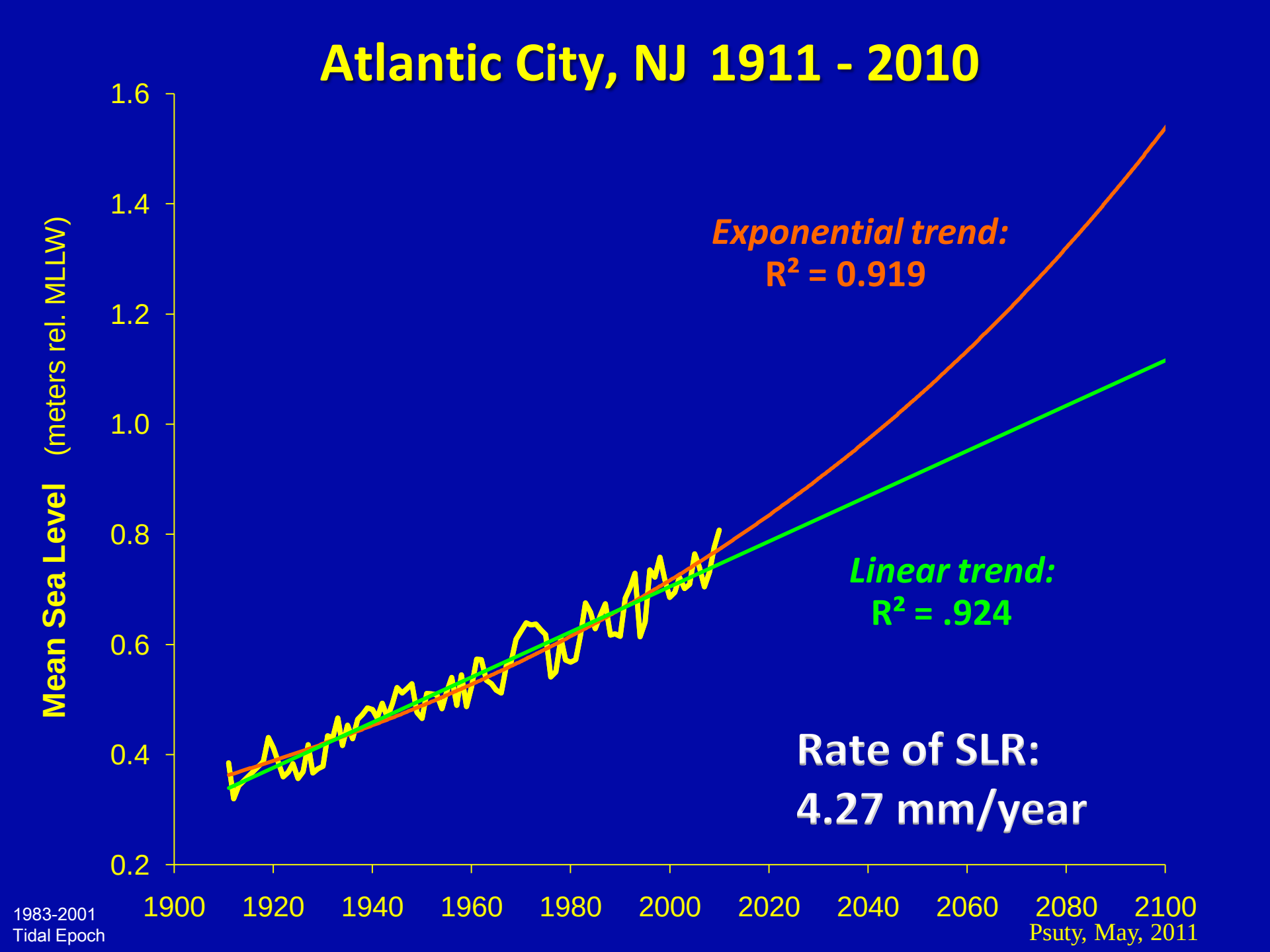
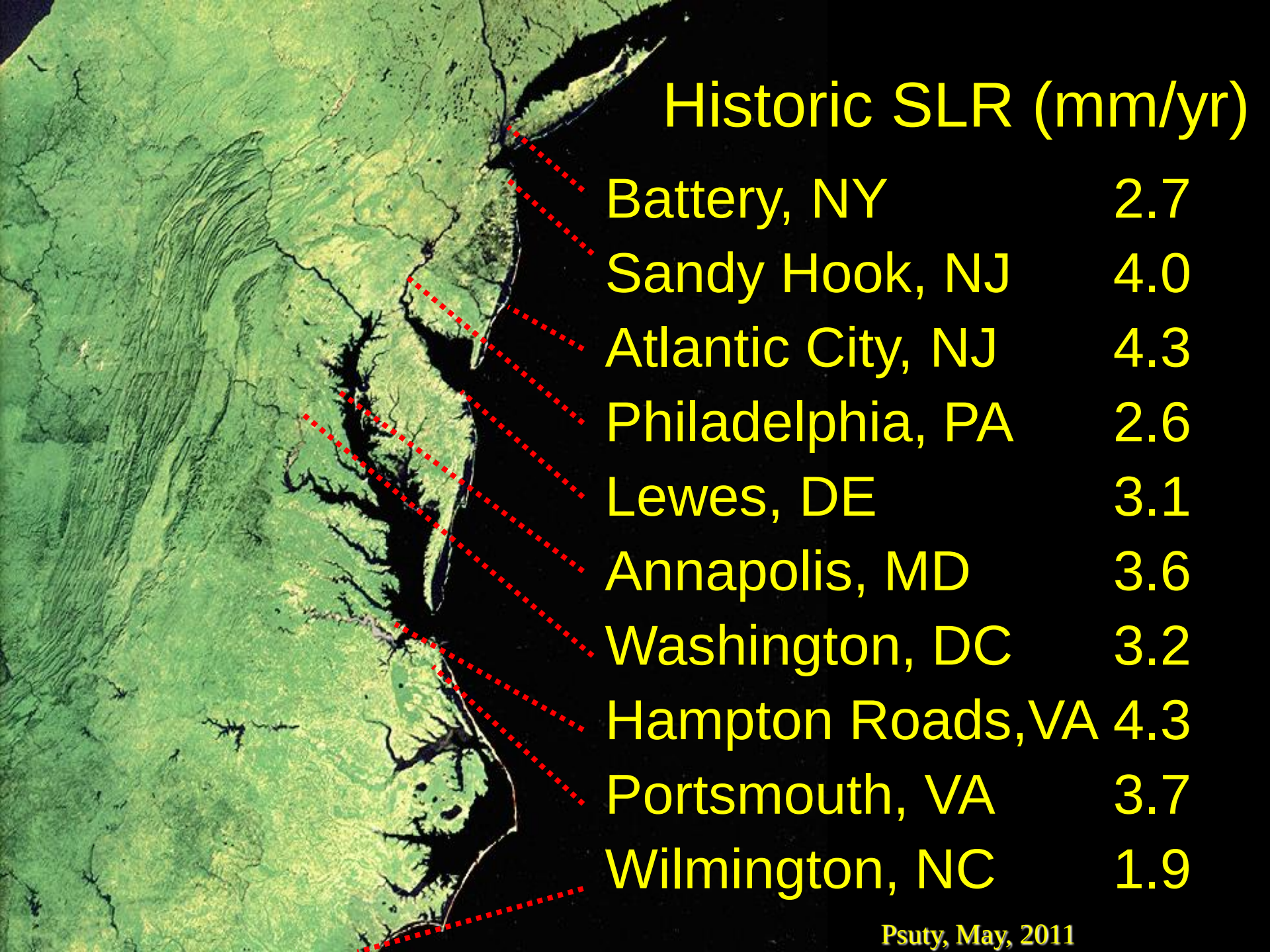
Atlantic City, NJ 1911 - 2010



Atlantic City, NJ 1911 - 2010




Historic SLR (mm/yr)
Battery, NY 2.7
Sandy Hook, NJ 4.0
Atlantic City, NJ 4.3
Philadelphia, PA 2.6
Lewes, DE 3.1
Annapolis, MD 3.6
Washington, DC 3.2
Hampton Roads,VA 4.3
Portsmouth, VA 3.7
Wilmington, NC 1.9
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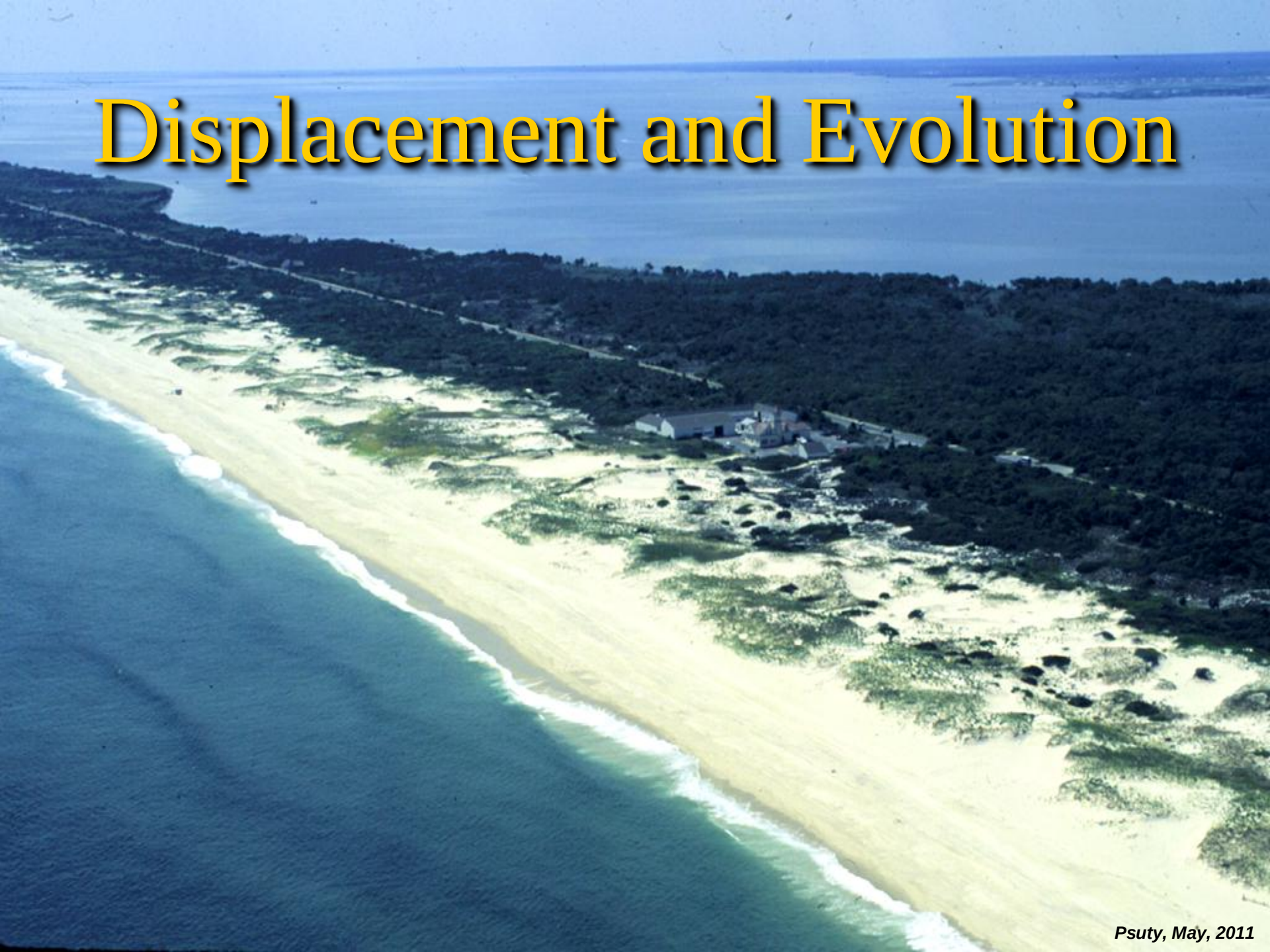
Scale Domain of Geomorphology

Process Geomorphology		Quaternary Geomorphology
Sediment Transport Rates	**SEDIMENT BUDGETS**	Environmental Reconstruction

TIME:	**Seconds**	**Hours**	**Days**	**Months**	**Years**	**Decades**	**Centuries**	**Millennia**
LENGTH:	**Millimeters**		**Meters**		**Kilometers**		**100s-1000s Kilometers**	

Displacement and Evolution



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Sand-Sharing Zone
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Beach and Dune Displacement

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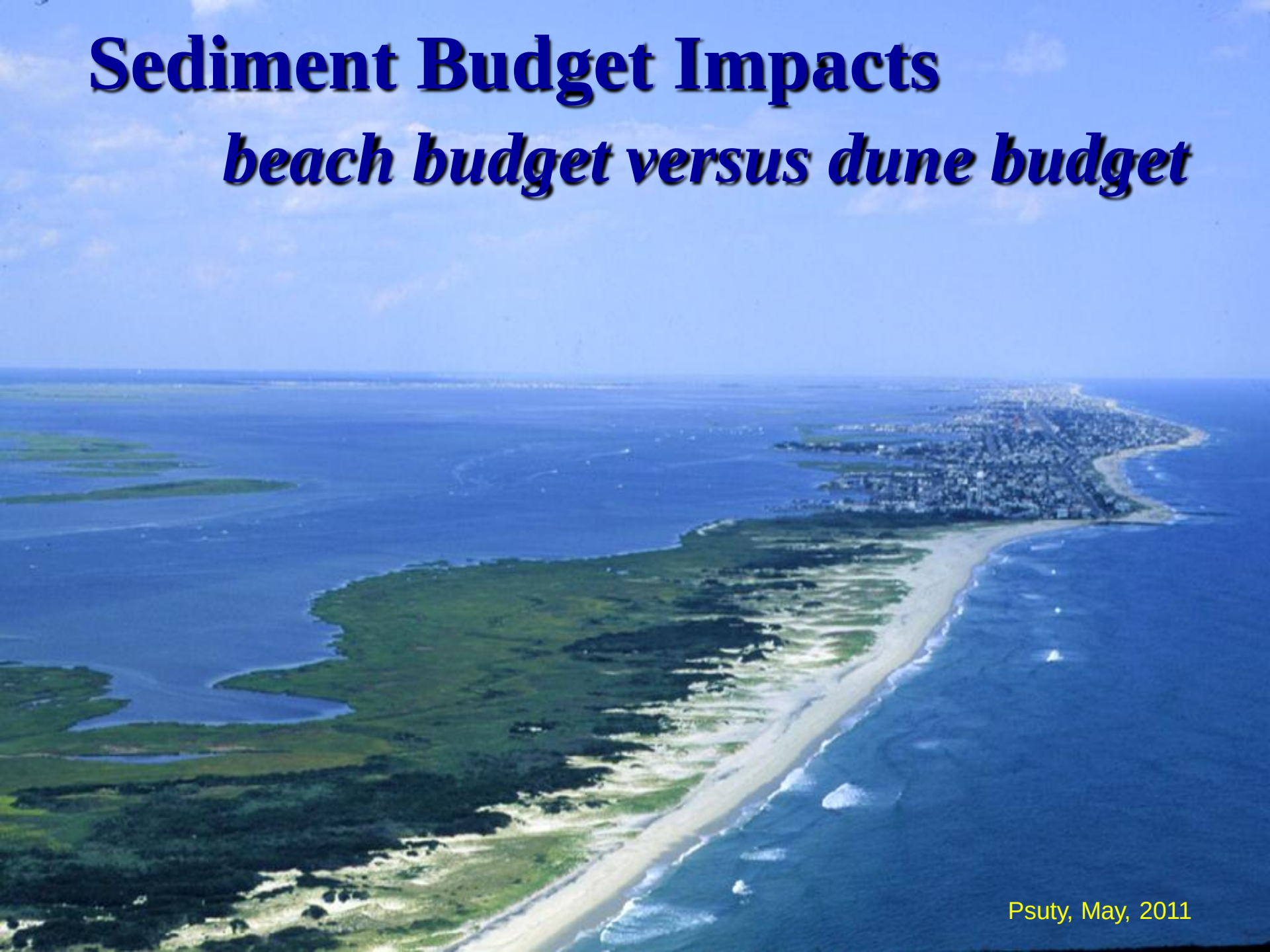
Sediment Budget Impacts

beach budget versus dune budget



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Negative Sediment Budget

Marsh edge transfer

Marsh deterioration

habitat loss


Low lying access
Clearance under bridges
Evacuation routes
Mean sea level
bayside vulnerability
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Static Land Use

Dynamic Coastal System

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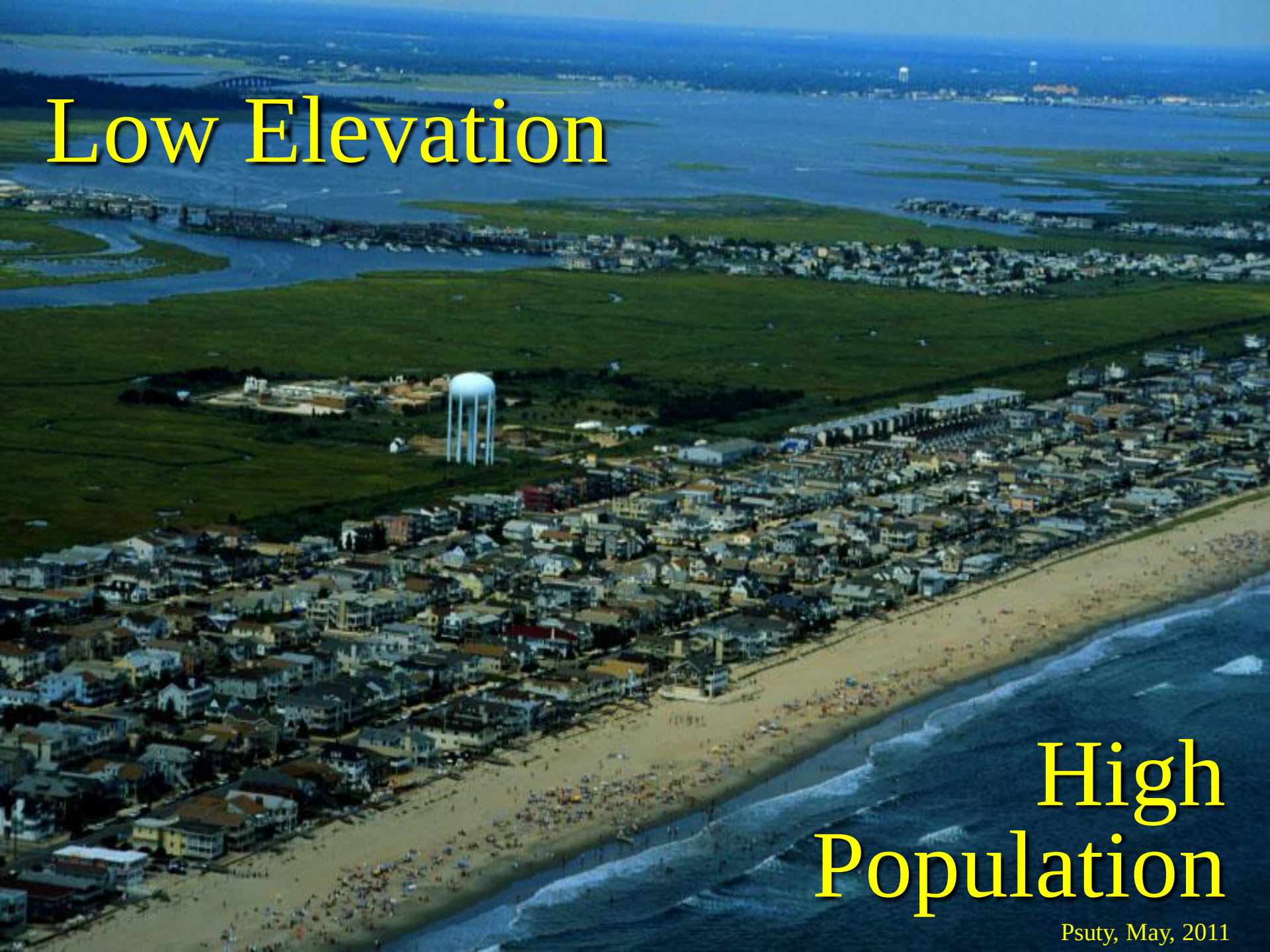
Low Elevation
High Population
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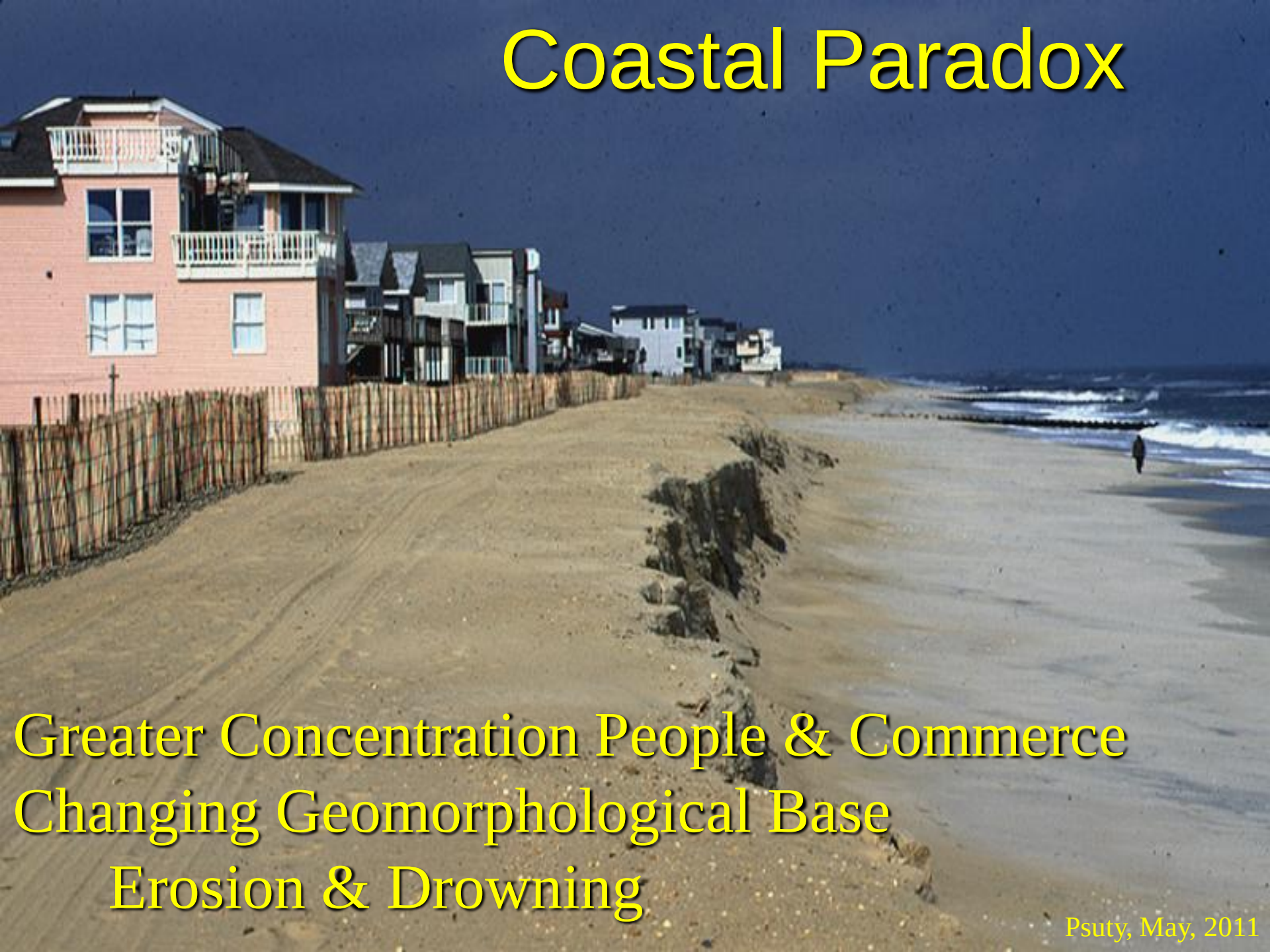
Coastal Paradox



Greater Concentration People & Commerce
Changing Geomorphological Base
Erosion & Drowning

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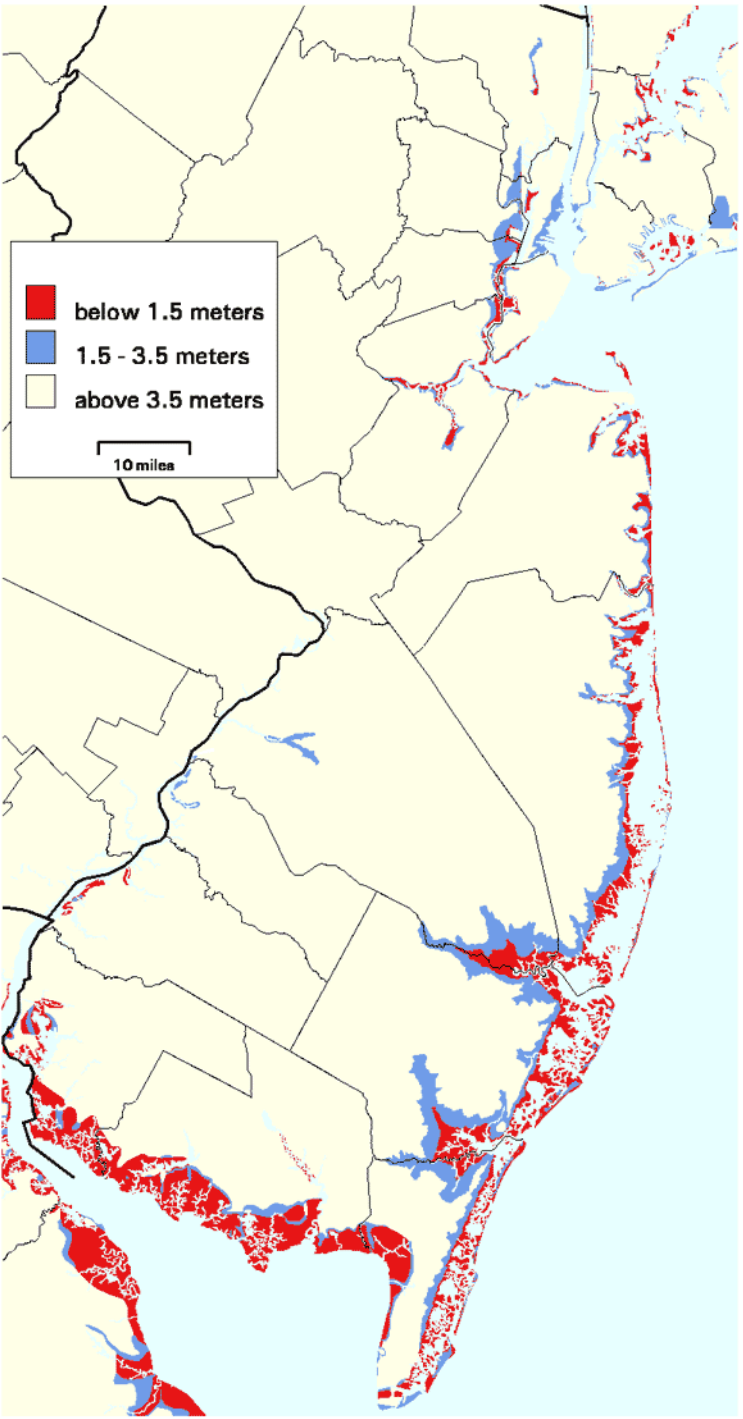

Sediment Budget

- Vectors of change
- Areas at risk

http://www.epa.gov/globalwarming/publications/impacts/sealevel/maps/maps.html

- Sea-Level Rise has been driving changes (negative sediment budget) and will continue to change the coastal environment.
- Knowledge of the magnitudes and directions of change are essential to decision-making.

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Sea-Level Rise in New Jersey

(are we getting wet, yet??)

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