New York

Verbatim Excerpts from the Latest EPA Report on the Effects of Sea-level Rise on the Mid-Atlantic States (page numbers for each passage in parentheses)

Highlights:

Many coastal areas in the United States will experience an increased frequency and magnitude of storm-surge flooding and coastal erosion due to storms over the next century, in response to sea-level rise. (537)

In the mid-Atlantic, between approximately 900,000 and 3,400,000 people (between 3 and 10 percent of the total population in the mid-Atlantic coastal region) live on parcels of land or city blocks with at least some land less than one meter above the monthly highest tides. (331)

Rising sea level, combined with the possibility of an increase in the number of hurricanes and other severe weather related incidents, could cause increased inundation and more frequent flooding of roads, railroads, and airports, and could have major consequences for port facilities and coastal shipping. (357)

Seawalls, bulkheads, dikes, sewers and drainage systems are designed based on the waves, water levels and rainfall experienced in the past. If conditions exceed what the designers expect disaster can result _ especially when sea level rises above the level of the land surface. (314)

Rising sea level can elevate the water table (ground water) to the point where septic systems no longer function properly. (520)

Some low-lying railroads, tunnels, ports, runways, and roads are already vulnerable to flooding and a rising sea level will only exacerbate the situation by causing more frequent and more serious disruption of transportation services. (354)

Short-term thinking often prevails. The costs of planning for hazards like sea-level rise are apparent today, while the benefits may not occur during the tenure of current elected officials. (495)

New York Metropolitan Area:

Given its large population, the effects of hurricanes and other major storms combined with higher sea levels could be particularly severe in the New York metropolitan area. With much of the area's transportation infrastructure at low elevation (most at 3 meters or less) even slight increases in the height of flooding could cause extensive damage and bring the thriving city to a relative standstill until the flood waters recede. (598-599)

Long Island:
Since nearly all of the Long Island Sound shoreline is densely populated and highly developed, the land may be armored in response to sea-level rise, raising the potential for beach loss. (588)

Shallow water habitats are a major ecological feature in and around the Peconic Estuary (east end of Long Island). Eelgrass beds provide food, shelter, and nursery habitats to diverse species, including worms, shrimp, scallops and other bivalves, crabs and fish. (589)

(Along Long Island's south shore) … numerous wildlife species could be affected by salt marsh loss. … Several species that are already showing significant declines, including clapper rail, sharp-tailed sparrow, seaside sparrow, willet and marsh wren. (590)

The back-barrier beaches of the South Shore also provide nesting sites for the endangered roseate tern and horseshoe crabs. (591)

Infrastructure Impacts:

Rising sea level, combined with the possibility of an increase in the number of hurricanes and other severe weather related incidents, could cause increased inundation and more frequent flooding of roads, railroads, and airports, and could have major consequences for port facilities and coastal shipping. (357)

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Sea level rise poses a risk to transportation in ensuring reliable and sustained transportation services. (354)

Some low-lying railroads, tunnels, ports, runways, and roads are already vulnerable to flooding and a rising sea level will only exacerbate the situation by causing more frequent and more serious disruption of transportation services. (354)

With a substantial acceleration of sea-level rise, traditional coastal engineering may not be economically or environmentally sustainable in some areas. (28)

Sea-level rise may also exacerbate pollution through inundation of upland sources of contamination such as landfills, industrial storage areas, or agricultural waste retention ponds. (240)

One impact of sea-level rise not generally mentioned is the decreased clearance under bridges. (355)

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Ecosystem Impacts:

Today, rising sea levels are submerging low-lying lands, eroding beaches, converting wetlands to open water, exacerbating coastal flooding, and increasing the salinity of estuaries and freshwater aquifers. (22)

Most coastal landforms in the U.S. will undergo large changes in shape and location if the rate of sea-level rise increases as predicted. (536)

Terrestrial and aquatic plants and animals that rely on coastal habitat are likely to be stressed and adversely affected as sea level rises. (26)

Sea-level rise will have profound effects by increasing flooding frequency and inundating low-lying coastal areas … coastal landforms such as barrier islands and wetlands may have thresholds or tipping points from sea-level rise and storms, leading to rapid and irreversible change. (39-40)

Flooding of low-lying regions by storm surges and spring tides is becoming more frequent. (60)

Wetland losses are occurring, fringe forests are dying and being converted to marsh, farm land and lawns are being converted to marsh, and some roads and urban centers in low elevation areas are more frequently flooded during spring high tides. (60)

Degradation and loss of tidal marshes will affect fish and shellfish production in both the marshes themselves and adjacent estuaries. (263)

Some barrier island coasts and wetlands may cross thresholds and undergo significant and irreversible changes. (537)

Many coastal areas in the United States will experience an increased frequency and magnitude of storm-surge flooding and coastal erosion due to storms over the next century, in response to sea-level rise. (537)

Erosion:

Nationally, coastal erosion will probably increase because of sea-level rise at rates higher than those that have been observed over the past century. (23)

Along the shores of the mid-Atlantic, which are comprised of headlands, barrier islands, and spits, it is virtually certain that erosion will dominate changes in shoreline position in response to sea-level rise and storms over the next century. (140)

More portions of the open coast of the United States will be subject to significant physical changes and erosion over the next century because the majority of coastlines consist of sandy beaches, which are highly mobile and in a continual state of change. (143)

If coastal erosion is gradual, one often sees a type of coastal blight in what would otherwise be a desirable community, with exposed septic tanks and abandoned homes standing on the beach, and piles of rocks or geotextile sand bags in front of homes that remain occupied. (312)

Increased shore erosion can further increase flood damages by removing protective dunes, beaches, and wetlands, thus leaving previously protected properties closer to the water's edge. (384)

Portions of the U.S. ocean coast are likely to undergo long-term overall erosion, at rates higher than those that have been observed over the past century. (540)

Preparedness:

The interdependence of decisions made by property-owners and federal, state and local governments creates an institutional inertia that currently impedes preparing for sea-level rise. (494)

Short-term thinking often prevails. The costs of planning for hazards like sea-level rise are apparent today, while the benefits may not occur during the tenure of current elected officials. (495)

About the Region:

Of the 10 largest metropolitan areas in the United States, three (New York, Washington D.C. and Philadelphia) are located in the coastal zone of the mid-Atlantic region. (334)

This region has approximately 1,100 kilometers (almost 700 miles) of shoreline along the Atlantic Ocean. Almost half of this coastline consists of ocean beach resorts with dense development and high property values. (304)

In the mid-Atlantic, between approximately 900,000 and 3,400,000 people (between 3 and 10 percent of the total population in the mid-Atlantic coastal region) live on parcels of land or city blocks with at least some land less than one meter above the monthly highest tides. (331)

In 2000, there were approximately 2.1 million seasonal or vacation homes in coastal counties. (333)

About Sea Level Rise:

How people respond to sea-level rise in the coastal zone will have potentially large economic and environmental costs. (19)

In 2007, the Intergovernmental Panel on Climate Change (IPCC) projected that global sea level will likely rise between 19 and 59 centimeters (7 and 23 inches) by the end of the century. (20-21)

(More recent research that accounts for rapid ice sheet melting that's been observed puts the numbers substantially higher. A comprehensive assessment report conducted by the U.S. Geological Survey and released last month by the White House estimates sea level rise at 50-140 centimeters or 1.64-4.59 feet by 2100. See page 24 at http://downloads.climatescience.gov/sap/sap3-4/sap3-4-final-report-all.pdf)

Sea-level rise is one of the impacts of climate change that will affect all coastal regions of the United States over the next century and beyond. (548)