Everglades National Park

I. Introduction
A. technically a river, flowing southwest at the rate of about a quarter mile/ day
B. largest subtropical wilderness in the U.S. with rare and endangered species
C. permanently protected for benefit of unique diversity of life it sustains

II. Human History
A. Native people before Spanish arrived in 1513
   1. 1000 BC - Calusa Indians - highly organized society
      a. architectural shell works, shell tools, carved wood, & long distance canoe trails
      b. by 1700s most had been decimated by disease brought by settlers
   2. white settlement forced immigrations of Creek southward for hunting and settling
      a. Seminole and Miccosukee were in the area as early as 1700s
B. Settlers and developers
   1. thought of the Everglades as potential farm land and communities
      a. by early 1900s, process of draining wetlands was underway
         1.) severely damaged the ecosystem and the species it supported
         2.) stimulated first of several south Florida land booms
         3.) railroads made the region more accessible and attractive to tourists
      b. 1920s - visitors/new residents in Fort Lauderdale, Miami, & Fort Myers
         1.) developers cut more canals, built new roads, removed mangroves from the shorelines and replaced them with palm trees
   2. 1948 - Congress authorized the Central and South Florida Project
      a. construction of elaborate system of roads, canals, levees, and water-control structures stretching throughout South Florida
      b. combined with increasing population pressures and changing land uses significantly degraded natural system

III. Geologic History
A. Paleozoic
   1. 250 MYA - collision of Africa with eastern coast of North America
   2. 200 MYA - rifting as plates separated
      a. ancient ocean rocks left behind as Piedmont Province
      b. sliver of Africa now lies beneath the sediments of the coastal Plain of Florida and offshore regions of Georgia and the Carolinas
B. Late Mesozoic and Early Cenozoic

1. 144 – 25 MYA – 3 miles of marine sedimentary rocks, mainly carbonates

2. 6 MYA – shallow sea covered the area
   a. sediments of silt and sand and particles of calcium deposited on the bottom of this sea gradually cemented into limestone
      1.) Tamiami Formation
         a.) highly permeable upper part forms lower part of Biscayne aquifer
         b.) low permeability of lower part confines Biscayne aquifer
         c.) fresh water from Big Cypress mixes with salt water from Gulf of Mexico to support a mangrove estuary – marine nursery

3. 1.3 MYA – Pleistocene (4 shorter ice ages with interglacial times)
   a. during ice age - sea levels were 300’ below present level
   b. during interglacial times – sea levels were 100’ above present level
      1.) CaCo3 settled out of water and coated bits of shell or sand in multiple layers
         a.) resulting spherical grains of limestone are called ooids.
      2.) longshore currents pushed ooids up into a long ridge – 20’- 40 above present coastal elevation
         a.) Atlantic Coastal Ridge runs from Mahogany Hammock to Miami
      3.) ooids later cemented into rock known as Miami Oolite
         a.) covers area east of Everglades National Park and Florida Bay
      4.) tiny moss animals called bryozoans flourished in quieter waters
         a.) as they died their calcium skeletons settled to the bottom
         b.) later cemented into rock known as the Miami Bryzoan Limestone
         c.) presently knob-like clusters encrusted with seaweed in Florida Bay

4. Flow of water in south Florida
   a. shallow, slow-moving sheet of water covered ~ 11,000 square miles
      1.) from Kissimmee River to Lake Okeechobee, southward over low-lying lands to estuaries of Biscayne Bay, Ten Thousand Islands, and Florida Bay
      2.) created mosaic of ponds, sloughs, sawgrass marshes, hardwood hammock, and forested uplands
   b. intricate system evolved into a finely balanced ecosystem that formed the biological infrastructure for southern half of the state

C. Present time

1. effects of changes in elevation
   a. Atlantic Coastal Ridge - pine forests & hardwood hammocks
b. wetter areas near end of the ridge - dwarf pond cypress  
c. south of the ridge - sawgrass prairies  
d. peat and muck soils  
e. narrow band of mangroves fringes the southeast coast  
f. shallow waters of Florida Bay - provide food supply for wading birds

IV. Comprehensive Everglades Restoration Plan  

A. 1995: Florida commission report  
1. related degradation of Everglades to lower quality of life in urban areas  
2. past environmental abuses brought state to a position to make a decision  
3. not acting to improve ecosystem would inevitably cause further and intolerable deterioration  
   a. harm local tourism by 12,000 jobs and $200 million annually  
   b. harm commercial fishing by 3,300 jobs and $52 million annually  
4. indicators of harm to ecosystem  
   a. 50% reduction in the original Everglades  
   b. diminished water storage  
   c. harmful timing of water releases from canals and pumping stations  
   d. 85% to 90% decrease in wading bird populations over the past 50 years  
   e. drastic water level changes in many bodies of water  
   f. hypersalinity  
   g. changes in marine and freshwater ecosystems  
   h. decline in water quality over the past 50 years the result of loss of wetlands that act as filters for polluted water  

5. What is to be done  
   a. 60 construction projects over 30 years to store water that was being flushed into the ocean, in reservoirs, underground aquifers, and abandoned quarries  
   b. add Stormwater Treatment Areas - filter water flowing into lower Everglades  
   c. regulate water released from pumping stations into local waterways, improve water released to Everglades National Park and Water Conservation Areas  
   d. remove barriers to sheetflow - raise Tamiami Trail and destroy Miami Canal  

1.) 2009 – construction began on mile-long (1.6 km) bridge to replace the Tamiami Trail, a road that borders Everglades National Park to the north and has blocked water from reaching the southern Everglades