

Connectivity among the Reaches of the Pearl River

Andrew Whitehurst
MMNS

Physical Features

- Every River can be summarized by its physical characteristics
 - Slope
 - Discharge
 - Amount and Particle Sizes of Sediments
- With a given slope and discharge a river can move a certain amount of alluvium of a given type.

Pearl Physical Characteristics

- 210 meter fall in 659 kilometers
 - Coastal plain stream with moderate gradient
 - An Alluvial Warmwater Stream
 - Transports sand, silt, some gravel bars
- Discharge: 373 cubic meters/ sec (mean ann.)
 - Discharge is 4th in rank of N. GOMEX rivers.
 - Mobile 1914 cu. m/sec
 - Apalachicola 759
 - Pascagoula 432
 - Pearl 373

Discharge

- Pearl Discharges to Lake Borgne and western Mississippi Sound
 - Moderates salinity in Borgne
 - Wind and tides push effects to Biloxi marsh complex of St. Bernard Parish, La.
 - Affects salinity in Pontchartrain via Rigolets and Chef Menteur

Relation to other Significant River Discharges to Pearl

- Bay of St. Louis mouth 18 miles E.
 - Jourdan and Wolf Rivers
- Major Pontchartrain discharges 40 miles W
- Pearl Basin: 18,400 sq. km
- Pontchartrain Basin: 10,700 sq. km
- Pearl Mean ann. Discharge is 38% greater than all Pontchartrain rivers combined
 - (Sikora & Kferve 1985)

Influence on Estuary

- Compared to river systems to the east and west, the Pearl River has the greatest influence on salinities of the Lake Borgne estuaries

Reaches of the Pearl

- Upper free flowing reach
- Impounded reach (Barnett Reservoir Dam)
 - Lotic to Lentic
- Urban reach (Tailwater)
 - Begins recovery - back to lotic,
- Lower free flowing reach, then to GOMEX
 - Pool's Bluff Sill
 - E./W. Pearl Diversion

Connectivity Interrupted for Fish Migration

- Pearl, unlike Pascagoula has main stem dam.
 - Diversion, Sill block some fish movement
- An amputated river for fish migration.
 - Gulf sturgeon, Ala. shad, American eel
 - Blockage absolute at dam.
- Continuity of habitats broken for diadromous (migratory) fish

Connectivity of River to Floodplain Habitats is Intact

- Even in the urban tailwater reach of the Pearl, lateral connectivity exists.
- Museum Slough at foot of LeFleur's Bluff
 - Catfish among the trees
 - Stomachs full of terrestrial organisms
 - Otters exploit fish in slough
 - Annual visits after high water
 - Wading birds glean what otters leave

Nutrients reach river via floodplain

- Allochthonous inputs of organic material
 - Leaves, decayed matter swept into river during winter, spring high waters
 - River functions like a long wet composting machine: breakdown into component nutrients: N, P compounds
 - Pathway for nitrogen and phosphorous compounds to reach primary producers
 - Algae, fungi, inverts, base of food chain for fish
 - Nutrients travel all reaches ending in estuary

Summary

- Pearl discharge vital to moderating/maintaining salinities in Borgne/E. Pontc. / Biloxi marsh complex
- Longitudinal Connectivity truncated
- Lateral Connectivity Intact
- Pearl at Museum is a good classroom
 - Annual floodplain functions on display