

Dr. Paul Montagna

A Brief History of Freshwater Inflow Policies and Studies



Abstract: Water development projects are constructed for human benefit, but always alter hydrology, thus altering environmental flow regimes, particularly for estuaries that are the receiving waters at the end of river courses. After the eight-year drought in the 1950s, which resulted in hypersaline estuaries, fish kills, loss of blue crabs and white shrimp, and invasions by stenohaline species, the Texas State Legislature passed a series of acts since 1975 requiring comprehensive

studies of the effects of freshwater inflows on bays and estuaries. On the policy side, management has moved from a species-based approach to an ecosystem-based approach. On the science side, many different tools and approaches have been developed to define inflow needs. We are now 10 years past the initial statewide environmental flow standards being established in 2011-2013, so we are at the beginning of a new era of adaptive management.

About the Speaker: Paul Montagna, Ph.D. is the Harte Research institute Chair for HydroEcology at Texas A&M University-Corpus Christi. He has been studying inflow needs of Texas bays and estuaries since 1986. He is currently the Editor-in-Chief for the journal *Estuaries and Coasts*.

David Buzan

Coastal Management Projects and Relationship to Freshwater Inflows



Abstract: Freese and Nichols, Inc. (FNI) is working on different projects for the Texas General Land Office involving construction of habitat and habitat protection features in estuarine environments. A recently completed project involved the siting and design of oyster reefs to be placed in the Galveston Bay system. Suitable salinities for oysters, changes in freshwater inflow, and tidal exchange were considered in identifying appropriate locations for construction of oyster habitat. Trinity Bay was considered but recent years of high freshwater inflow reduced oyster productivity in that system. West Bay was not considered because in recent decades

freshwater inflows have not been consistent enough to sustain healthy oyster reefs, decimated by dermo in higher salinity environments. East Bay was selected for oyster reef construction sites because of the relatively stable salinity regimes. However, the closure of Rollover Pass to tidal exchange has raised unanswered questions about the long-term salinity patterns in East Bay and their suitability for oysters.

A current project involves protecting and restoring the mouth of Carancahua Bay, a secondary bay of the Matagorda Bay system. Erosion and shoreline breaches along Redfish Lake and Salt Lake, within the Carancahua Bay system, have resulted in ecosystem change threatening marshes. Sea level rise, changes in sediment transport, and tidal prism will continue to impact this system. Questions arise whether or not there will be adequate sediment accretion to support existing marshes and prevent marsh drowning, and whether or not there be adequate freshwater inflow in the future to maintain this ecosystem?

About the Speaker: David Buzan is a Biologist with Freese and Nichols, Inc. in Austin who has worked on water quality and quantity issues in Texas since 1978.