

## Coastal Ecological Flows: 11/13/18 Meeting and Future Planning

Dear Dean, Stacey, and APNEP staff,

Bob Christian, Stephen Moysey (Director, ECU Water Resources Center), and I met in Greenville to discuss developing a program to evaluate and develop coastal ecological flows recommendations for the Albemarle-Pamlico Drainage basin. We thought the way forward would be to select two watersheds (one inner coastal plain; one outer coastal plain) for detailed pilot studies that focused on flow-ecology relationships, longer-term flow record analysis, and detailed water budgets to help develop a better understanding of the linkages between water use, meteorological conditions, and low flows and the ecological response to flow alteration (including flow, stage, and salinity aspects). Based on earlier discussions and the report findings we thought that Contentnea Creek (Inner CP); and the Chowan River and some of its tributaries near Windsor (Outer CP- tidal) might be good systems to select for further study based on pre-existing data, current monitoring, and for the outer CP sites, the work may tie in with ongoing work that Bob Christian and Stan Riggs (ECU; Land of Water) have been conducting on flows in Bertie Co. In some of the tidal or floodprone areas in the Outer Coastal Plain region, there may also be the opportunity to increase the availability of river stage information through the State Emergency Management Program that installs stage gages for flooding, it may also be possible to tie in conductivity or salinity gages to those to fill in gaps in salinity monitoring.

During the discussion, we also thought an outreach component would be helpful to educate students and stakeholders on the balance between economic benefits of water use and the ecosystem services provided by instream flows. An outreach component could include educational materials and workshops on the importance of ecological flows; student participation, and citizen science components (mapping/monitoring salinity, flow, headwater drying, etc.). From the data report provided earlier, it was clear that substantial efforts have been made in Virginia and in other states with USGS involvement, the materials (provided in the appendices) and the current USGS efforts in the Cape Fear region may provide valuable information that can help guide coastal plain ecological flow recommendations in the Albemarle-Pamlico Drainage Basin. To develop pilot studies within the A-P drainage basin, the first steps would be to pull together pre-existing data for pilot study from the specific watersheds identified (possibly including water flux data, water stage data, ecological data, salinity data, water use data, presence of dams, wastewater inputs, etc.); design the pilot study and define the objectives; determine data gaps for those watersheds and what/where instrumentation is needed; and seek funding and support for the effort(s). APNEP can help by defining their goals specific for the region or watersheds selected and assigning staff that can spearhead the effort. The effort would require APNEP buy-in, technical and logistical support, and an effort to determine expertise needed and stakeholders who can/should be involved. DEQ involvement will be crucial to provide guidance on how applicable their basinwide hydrological models for the river basins in the Albemarle-Pamlico basin are and if they can help predict the places, times, and frequencies at which ecological flows may be adversely affected in coastal North Carolina. Therefore, future work on ecological flows in the Albemarle-Pamlico drainage basin should aim to complement the past and potential future efforts by NC DEQ. ECU can help with potential efforts to improve saltwater intrusion monitoring, student participation, citizen science, involving the Water Resources Center and interested faculty with water/ecological expertise. As noted in the last meeting, Bob and I have agreed to co-lead the team. We believe to be effective the team should also include APNEP and DEQ staff with job responsibilities that include developing the coastal ecological flows program and we should aim to have regularly scheduled meetings and have access to funding, data, and resources to support the effort. We are looking forward to working together to move this program forward.

Sincerely,

Michael O'Driscoll, ECU- Dept. of Coastal Studies

Bob Christian, ECU- Dept. of Biology (Emeritus)

Stephen Moysey, ECU- Dept. of Geological Sciences, Director, Water Resources Center