

APNEP Flows Workgroup Kickoff Meeting

7 April 2015

East Carolina University, Greenville, NC

Workgroup Members Attending: Eban Bean (East Carolina University), Bob Christian (East Carolina University, retired), Rhonda Evans (USEPA Region 4, participating by telephone), Mike O'Driscoll (East Carolina University), Mike Piehler (University of North Carolina), Judy Ratcliffe (NC Natural Heritage Program), Fred Tarver (NC Division of Water Resources)

APNEP Staff Attending: Dean Carpenter, Jim Hawhee.

Dean began the meeting at 10:11 and asked for introductions from workgroup members and staff.

Dean provided an introduction to APNEP via PowerPoint, which will be posted on the Flows Workgroup website (<http://portal.ncdenr.org/web/apnep/flows>). This included an overview of APNEP's history, ecosystem-based management approach, Comprehensive Conservation and Management Plan, and actions relevant to the workgroup.

Group discussion of whether "basinwide management plans" refers (or should refer) to DWR's planning process. Dean noted that a linkage to DWR planning was the original intent but that it is open to the workgroup on the best approach. N.C. Environmental Management Commission (EMC) guidance complicates the inclusion of ecological flows in DWR documents.

Mike Piehler noted the uniqueness of streams originating in the coastal plain and the inability of DWR's Science Advisory Board (SAB) to address coastal streams. The group discussed whether the focus should be on large river systems or the smaller coastal streams.

The group agreed that CCMP action A3.3 (establishment of ecological flows) should be done well first. Efforts should be able to be incorporated into basinwide planning documents at a later date, but perhaps not immediately.

Mike O'Driscoll asked about progress with Chesapeake Bay. Dean indicated he will seek out their progress on flows issues (action item).

Workgroup members discussed the flexibility of the actions and how they were worded. Dean and Jim noted that APNEP's approach will allow adaptive management and adjustments to CCMP actions as the workgroup progresses.

Judy asked about the interface with this workgroup and monitoring workgroup(s). Dean discussed the integration of both APNEP's STAC and monitoring teams with the flows workgroup.

Mike O'Driscoll noted that with regard to a monitoring strategy, there are huge gaps in the coastal plain regarding monitoring, both large coastal streams and smaller streams. Identifying these monitoring gaps is necessary but would require significant resources to address.

Can APNEP be a data repository or provide resources to develop one? Mike O'Driscoll asked if USGS should be engaged given their monitoring efforts. USGS doesn't monitor east of the fall line because of (bidirectional) flow.

The absence of USGS and WRC staff was noted, with the group suggesting their presence is integral to the real world vetting of academic information.

Regarding membership, the group agreed that another three to six partners might be a reasonable number.

Rhonda- while higher level policy types may not be in the workgroup, especially with regard to technical aspects, opportunities for intermittent policy feedback would be useful. A phased approach between flows analysis (early) and flows implementation (later) may be warranted and helpful.

Break for lunch 11:30. Reconvene 12:30.

Jim provided a brief overview of APNEP's website and the Flows workgroup website, including the listserv and Google Drive access. Jim will subscribe workgroup members to the mailing list (action item).

Fred Tarver provided a historical overview of NC-DWR Ecological Flows Science Advisory Board (EFSAB), formed in response to North Carolina legislation to establish flow requirements. Flow for planning purposes for the entire state helped mitigate the need for site-specific planning studies. The EFSAB produced a [data product](#) identifying gaps and providing recommendations.

Recommendation of 85% flow-by was put out for public comment. After EMC concluded that this was quasi-rulemaking, ecological flows are not included in DWR modeling.

General expectation is that 80-90% flow-by (from current conditions) might address many coastal issues.

There was some examination of looking at conditions from the 1960's as a flow baseline. RTI was using the model "Waterfall" to examine historical conditions.

Predevelopment flow in the coastal plain might be lower than today's flow due to ditching and draining in the interim. Also, community water from an aquifer and septic tanks may also be contributors.

Is part of APNEP's charge to go upstream? Possible that local estuarine system condition could overwhelm upstream impacts. Land use projections (additional impervious surface in the Triangle) add additional challenges.

Are needs and work of the SAB appropriate for APNEP upstream of the reference gauges? If so, can focus on coastal downstream areas.

Only way to factor in climate change impacts is going to be with modeling, so some modeling is likely appropriate. RTI's "Waterfall" is advantageous over DWR's model "Oasis" for incorporating climate modeling. However, coastal area is still unknown using "Waterfall". So the group is mostly geared toward research to better understand the system.

Bob Christian provided a refresher presentation from the EFSAB (to be linked on the workgroup's website). The group discussed linking stream typology and potential "essential factor" determination to consider for ecological flows. In addition to discharge and habitat, downstream salinity, and overbank flow, discussion of overbank incision and seasonality were also discussed. Three general conditions were medium gradient, low gradient, and tidal.

Bass, herring, and shad (keystone species) have some flow requirements that have been identified. Bald cypress also provides an ecological indicator.

Sea-level rise appears to be impacting flows on a scale relevant to management (decadal scales) based on some work in the New River by Scott Ensign.

One difference from the EFSAB's work: APNEP would have an interest in flows for saline areas.

The Tar River has a 100-year data record. What about wet-dry cycles (30-year time)?

EFSAB didn't discuss interactions between water quality and water flow.

The group could potentially identify hotspots or watersheds that are potentially affected. Connectivity due to tides and climate change may or may not be protected.

Regarding data gaps, Blount's Creek is a potential place to do a baseline study to look at river changes over time. These would include changes in minimum and maximum flow, looking at extremes. Which species are more vulnerable?

Mike Piehler proposed ecosystem services of coastal stream flows analysis. Weyerhaeuser has a five-year record on forested tracts. Mike also has some with time horizon data. Changing evapotranspiration.

A key aspect for minimum flows is connectivity to surficial or deeper aquifer systems. Monitoring is lacking in this regard. Connection with a deeper system would make systems less vulnerable. Available tools can provide depth to the confining unit.

Water budget for medium, low, and wind/tidal driven flows? Latter is the hardest.

The group had some discussion of whether this work should be focused on supporting potential regulatory initiatives. The focus in the short term is identifying what a healthy system looks like, identifying a reasonable balance and diversity of ecosystem services.

Flashiness and minimum flows were discussed as potential metrics.

Identifying whether stream system or watershed is a major player in overall ecosystem health. Related to Blount's Creek. Rather than a comprehensive approach to the watershed, work on a smaller study scale and developing some modeling.

Bob proposes pulling together prior study data, conduct preliminary analysis, characterization of flows. Develop a list of where things have been instrumented. How do gages predict flows further down the

watershed? Use these to work within a potential impact area. Find out what we do know. Need more than a graduate student level understanding of these concepts. Perhaps also leverage studies in Virginia and South Carolina.

Mike Piehler agreed to work with APNEP staff to draft a scope of work on behalf of the workgroup.

Monitoring of stage, temperature, conductivity, and DO was discussed, which could be reasonably priced but wouldn't be real time. This is a potential add-on effort.

It was noted that ACOE flood data shows how big streams used to be, but it can be hard to get their data.

Other partners to invite: USGS (candidates include Gene Robbins, Tom Cuffney, Scott Ator), WRC(?), Virginia(?)