**Middle Chattahoochee Watershed Meeting**

**Status Report on GIS Mapping Watershed Prioritization Study, HAB Study, & Source Water Protection Planning/Water Quality Studies**

*August 29, 2018*

***Attending:***

William Kent and Beth Bickerstaff, Columbus Water Works; Billy Turner, Troy University Center for Water Resources; Scott Thackston, Georgia Forestry Commission; Dawson Ingram, Georgia Power; Jamen Blair, Fort Smith Water and Sewer; Tracie Hadaway, Troup County Planning; Susan Wilde, UGA Warnell School of Forestry & Natural Resources; Duncan Elkins, UGA River Basin Center; Dale Dickens, Alabama Forestry Commission; Hannah Bradford, Chattahoochee River Keeper; Jessica Brown, Georgia Sea Grant; Frank Greene, Georgia Tree Farm Program; Christine McKay & Bryan Hummel, US EPA Region 4; Kitty Weisman, SE Partnership for Forests & Water

***Duncan Elkins, UGA River Basin Center – GIS Watershed Prioritization Study Update***

* Duncan presented landsat data for the Middle Chattahoochee. There is 78 percent natural land cover, which is pretty good but that is changing rapidly. As a comparison, Savannah River stakeholders decided to maintain 70 percent forest cover for drinking water source protection. According to the Southern Forests Futures Report (USFS) and Duncan’s research, the southeast and the Middle Chattahoochee watershed are losing forests, which are turning into “altered land use categories.” The watershed was 57 percent forested in 2011.
* Upstream forests predict lower treatment costs (Ernst et al 2004).
* One issue is to figure out how to deal with large reservoirs in the study: should the analysis stop at the reservoirs?
* Duncan may use Land/Fire database to correct for some of his data/analysis, and also hoping for landsat 2016 data to be released soon for more up to date data.
* Lands that affect downstream water quality - the study model is the Savannah River study, and he is also using a model developed by UMass Amherst (Wae Lee Zang). According to these models, seven factors affect surface runoff: land use, proximity to streams, proximity to ponds/wetlands, soil permeability, soil erodibility, slope, and floodplain. These factors are weighted at 3 points apiece for a total score of 21. Conservation priority index = 3 points for forest cover, etc.
* The map Duncan referred to in his presentation didn’t show a lot of green areas (areas with a high conservation priority index)
* The study uses 30 m – 90 m buffer around tributaries, and places a conservation priority area around river/stream confluences
* Northwest, southwest and central areas of the study area have some high conservation priority scores.
* Spatial averages show areas for stewardship/restoration that score pretty well. Note that the term “restoration” refers to both stewardship (including conservation) as well as restoration. Ideally we would score areas for stewardship/conservation/restoration.
* Question – do altered categories include hard surfaces/developed? The answer is yes.
* Question – what are the project’s geographic boundaries? Duncan and his team are using the USGS map and overlaying that with the state basin planning boundary for the Middle Chattahoochee watershed and the Columbus Water Works source water protection area (which includes the SWP area for six utilities on the Alabama side of the river).
* *Questions for the Group:*
  + Do these seem like the right areas? – Duncan will send data to William so he can get a better idea (conservation vs. restoration). Stewardship encompasses conservation, restoration, BMP’s
  + Other weightings we should try?
  + Other data we should consider? Landsat to be released Dec 28, soil classification/erosion potential – William can plug historical water quality data into Duncan’s map/model
  + What about dams and intakes?
* Duncan used three primary datasets: Trust for Public Lands, EPA, and University of Missouri Forest Retention dataset. He is also referring to the SA-LCC Conservation Blueprint, TNC Longleaf Priority Areas.
* Question – any data for Urbanization Potential?
* Question – any data for Urban Growth – Climate Adaptation?
* Any additional data he identifies later can be incorporated into the model.
* Question – can we delineate contributing areas near intakes? This is a good idea to implement in the future.
* Billy Turner Question – forest cover and treatment costs – does this apply to Middle Chattahoochee? Should we try to localize that to Mid Chatt a little better? His belief is that water quality issues affect a wide variety of issues not just water treatment. The drinking water utilities in this basin use alum-based water treatment.
* Duncan – there is data (Jeff Powell work in AL – BMP’s) – showing scour basins – decreased treatment costs; sediments are accompanied by other things like nutrients, other chemicals, etc.
* William Kent comment -regression slide is interesting; he wants to show this to Steve Davis.
* 78 percent natural area cover is actually really great compared to other basins but the Southern Forest Futures Report shows this will change in next 20 years which will impact all water uses/users.
* Tracie H – A lot of the 78 percent natural area cover is in the south where there won’t be much change in terms of development; the main changes will be in the north part of Duncan’s maps.
* Follow up idea: Each county has growth potential maps which we can use to refine our priorities in the north part of the map.
* Follow up idea: Have the county planners, regional commissions meet with our group to discuss how they can help our effort re: green infrastructure, zoning, permitting related to our priority areas.
* APA is doing a big push on water quality and water planning
* Billy – consider segmenting the map into three segments; LaGrange water supplies, north of Columbus (Euphalla), then Columbus bottom part of the map.
* Scott- Duncan’s data is by pixel not parcel (yet). How do we turn the map/analysis into parcels? Duncan says next steps would be to take an aerial average like in Savannah study. Or combine pixels. Duncan thinks he will have enough funding to integrate parcel data.
* Duncan will refine basin/map to just include the priority area we identified (Columbus SWP area) - West Point Dam down to Columbus.
* Billy Turner asked about including demographics into Duncan’s study.

***Susan Wilde Presentation on Harmful Algal Blooms***

* Chlorophyll peak is not at the surface of the water, it’s actually below the water’s surface. So you might have a dense algal accumulation just out of sight and not know it.
* There are surface algal mats and sub-surface algal mats.
* Follow Up Idea – to map water intakes on the maps to see where risk levels are with respect to the algal blooms; depth and location of water intakes in relation to algal blooms
* Spikes in algae indicators – some algal species prefer lower light; we can find out if there are toxins associated with them. Also would be good to overlay high nutrient areas.
* Would be good to know if there is a subsurface flow that might be faster in some areas.
* Follow Up Idea - William says no doppler radar at Goat Rock but it would be helpful Susan says.
* Last August – blooms of hydrilla and microcystis – many blooms right below fertilized private lands (lawns) .
* Idea – city work with landowners re: fertilizing – maybe Chattahoochee River Warden and River Keeper – citizen science/outreach.
* Question – what causes algal blooms? Fertilizing lawns, wind, sub-surface water flows, sub-surface sediment, light, temperature, weather.
* Idea – match up data with time of day and weather.
* Idea – consider roads as potential contributor of nutrients? Road might be a conduit due to stormwater inflow.
* Phycocyanin – has particular blue green pigment and gives you relative biomass.
* Susan says high nutrients, esp. phosphorus promotes harmful algal blooms!
* A lot of the algal blooms may not show up on a satellite image because they are subsurface.
* Idea – we may want to keep track of areas where there is a probability of subsurface algal blooms.
* Billy – is hydrilla surfacing a lot slower this year?
* Idea – we may want to keep track of areas where there is a probability of subsurface algal blooms.
* Billy’s conference Oct 22nd -23rd – Billy will send announcement and Kitty will send to everyone.
* Susan – high rainfall and lots of flow and turbidity isn’t conducive to hydrilla forming but after some time there might be more hydrilla when everything settles down
* Toxic cyanobacteria likes to grow on hydrilla – Susan can’t find it which is great! Susan is working on figuring out why and what makes that cyanobacteria tick.

***William Kent – Columbus Water Works SWP Plan Update and WQ Study***

* Source Water Assessments already completed for this area – now in process of updates to the Middle Chattahoochee/City of Columbus Source Water Protection Plan. Not much has changed over time which is great. No silver bullet – no change so how do we maintain what we have?
* Biggest land use change in this area is the high and medium intensity development focused in West Point area (caused by Kia plant). A lot of shrub and scrub growth in this area (maybe post deforestation?).
* Brainstorming – what to do in the future? Public education would be a good place to start.
* Target landowners around Columbus – individual landowners.
* Conservation easements – one of the approaches the City want to seriously consider for priority areas.
* 100 foot buffers as possibility for increasing protection around surface waters (would need collaboration with county planners).
* Also working with Susan Wilde and Matt (with Auburn University) and others on evaluating/analyzing HAB’s, sediment cores, and nutrient data. All that info will be pulled together and ready for presentation at some point in the future.
* Columbus and areas south are not a huge growth area – but Tracie says Troup county/Opelika is experiencing exponential growth – so areas just north of Columbus are experiencing rapid growth
* Idea – overlay Duncan’s study with growth potential data in our priority area on the map (see above) to identify areas we want to focus on for stewardship. Can we also overlay Southern Forest Futures data on forest conversion predicted/expected?
* Billy – give some thought about how to present the overall picture.

***Follow Up Ideas for Duncan’s GIS model/study:***

* For the GIS model/study - consider segmenting the map into three segments; LaGrange water supplies, north of Columbus (Euphalla), then Columbus bottom part of the map.
* Explore ways to incorporate demographics into the study/model
* Each county has growth potential maps which we can use to refine our priorities in the north part of the map.
* Duncan will send data to William so he can get a better idea (conservation vs. restoration). Stewardship encompasses conservation, restoration, BMP’s. William can plug historical water quality data into Duncan’s map/model.
* Overlay Duncan’s study with growth potential data in our priority area on the map to identify areas we want to focus on for stewardship. Also explore possible overlay of Southern Forest Futures data on forest conversion predicted/expected?
* Have the county planners, regional commissions meet with our group to discuss how they can help our effort re: green infrastructure, zoning, permitting, demographics related to our priority areas.

***Follow Up Ideas for Susan’s HAB study/work:***

* Map water intakes on the maps to see where risk levels are with respect to the algal blooms; depth and location of water intakes in relation to algal blooms
* William Kent says there is no doppler radar at Goat Rock, but Susan says it would be helpful to have that data. William will look into cost and feasibility of doppler radar at Goat Rock.
* Overlay high nutrient areas onto Susan’s map.
* Find out if there are toxins associated with algal species that prefer lower light.
* Match up HAB data with time of day and weather
* Consider roads as potential contributor of nutrients? Road might be a conduit due to stormwater inflow.
* Keep track of areas where there is a probability of subsurface algal blooms.
* Need to work with/educate landowners re: lawn fertilizing issue as cause of algal blooms; maybe City of Columbus together with Chattahoochee River Warden and River Keeper can get a citizen science/outreach program started.

***Other Meeting Follow Up:***

* Kitty will put Duncan and Susan’s presentations in PDF format & send to the group
* Billy will send Kitty information about the Troy University Center For Water Resource Economics Conference Oct 22nd -23rd and Kitty will forward to Mid Chatt partners.
* Kitty will schedule a follow-up meeting for after the holidays to review the status of these three studies.
* LuAnn Creighton at TPL previously indicated to Kitty that she is willing to serve as the lead entity on a Healthy Watersheds Consortium Grant Program proposal. Kitty will schedule a smaller group meeting to figure out whether to apply in the next round.