Apalachicola-Chattahoochee-Flint Stakeholders: Working Together to Share a Common Resource

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Abstract

The Apalachicola-Chattahoochee-Flint watershed begins in Georgia, with the headwaters of the Chattahoochee near Unicoi and the headwaters of the Flint near Atlanta Hartsfield Airport. These rivers flow south to join at Lake Seminole, forming the Apalachicola, which flows south through Florida towards the Apalachicola Bay in the Gulf of Mexico. With over 48 inches of average annual rainfall, the basin has historically had significant water resources to support many uses. To provide increased water management opportunities, four major federal reservoirs were constructed on the Chattahoochee, beginning in the 1950s. With the rapid population growth in the basin, particularly in the last two decades, as well as the implementation of agricultural irrigation beginning in the 1970s, combined with several significant drought events, stress on available water resources has been observed.

Water use in the basin has been litigated for more than two decades. Recognizing that litigation and politics have been unable to resolve the issues, a grassroots effort was launched by the individuals and groups most impacted by the situation – the stakeholders themselves. The ACF Stakeholders brought together a diverse group representing all water use sectors, organized by geographical basin caucuses. The ACF Stakeholders was incorporated as a 501(c)3 nonprofit in late 2009, and has since begun working together to achieve a common goal: the development of a sustainable water management plan. The ACFS's mission is to recommend equitable water-sharing solutions among stakeholders that balance economic, ecological and social values while ensuring sustainability for current and future generations. The ACFS has generated private investment of greater than $1,000,000 for the development of this historic plan through scientific modeling and a shared vision process. The workplan for this effort has been developed, and work on the Sustainable Water Management Plan, including identification of performance indicators for computer modeling of the basin, compilation of the latest water use and other input data, and documentation of water management alternatives, is underway.

This stakeholder driven planning process is a unique example of empowerment of impacted water users seeking to develop consensus around water management priorities. The ACFS' democratic, collaborative approach is distinctly different from other efforts in the watershed, and it offers an unprecedented opportunity to reach a long-term solution. This paper will present the progress to date and some of the challenges of multi-discipline planning aimed at developing consensus solutions in a complex environment, particularly given the endangered species issues in the Apalachicola River, in the Apalachicola-Chattahoochee-Flint basin.

Background

The Apalachicola-Chattahoochee-Flint Stakeholders began as a small group of concerned community leaders meeting informally in 2008. By the time ACFS incorporated a year later, it had grown to involve individuals and interest groups from four defined watershed basin caucuses.

Figure 1 - ACF Basin and Basin Caucus Overview Map

(1) Upper Chattahoochee

Defined as the waters entering the ACF Basin north of the USGS Franklin Gage at Franklin, Georgia, this sub-basin includes Lake Lanier and much of the greater Atlanta metropolitan area, which has experienced rapid population gain in the past two decades. In addition to the homeowners and boaters interested in maintaining water levels on Lake Lanier, thousands of residents enjoy recreational opportunities in the Chattahoochee National Recreation Area. Sub-basin residents also require substantial water supply needs. Gwinnett County is particularly

impacted because Lake Lanier is the only source of drinking water for a countywide population of 800,000.

(2) Middle and Lower Chattahoochee
Extending south of the Franklin Gage to the confluence of the Chattahoochee and Flint rivers at the Jim Woodruff Lock and Dam (JWLD), this sub-basin is distinguished by a variety of interests including growing municipalities, waste water management facilities, power plants, industrial manufacturers, and historically and culturally significant river towns. Four of the five major ACFS reservoirs managed by the U.S. Army Corps of Engineers lie within this sub-basin and are important for recreation, flood control and navigation interests.

(3) Apalachicola
South of the JWLD, the Apalachicola River drains into the Apalachicola Bay creating the river system and estuary with the highest biodiversity of any in North America – one of thirty places in the world designated by UNESCO as a "Man in the Biosphere Reserve." International conservation organizations have also designated it as a "Biological Hotspot" and "Biogem" for its global ecological importance. In addition to preserving this unique environment, sub-basin representatives are interested in maintaining a vibrant seafood industry that has supported communities for generations.

(4) Flint
Starting in East Point, Georgia, the Flint River springs up from under the runways of Hartsfield-Jackson Airport and through the developed suburbs south of Atlanta before it winds through the rural countryside of central and southern Georgia. It flows naturally unimpeded until it reaches the Lake Blackshear reservoir near Warwick, then on to Lake Seminole near Bainbridge where it merges with the Chattahoochee to form the Apalachicola. This sub-basin is characterized by the Southeast's most productive agricultural land, supporting farming operations that contribute $50 billion to the gross national economy.

ACFS now has a membership of almost 100 individuals and groups. Annual membership dues range from $25 for a non-voting member to $2,500 for members that represent a public jurisdiction with more than 100,000 residents or industry members with more than 500 employees. Each of the four sub-basins has the opportunity to appoint 14 stakeholder representatives to serve on the 56-member ACFS Governing Board. These stakeholder interests include:

(1) Navigation
(2) Recreation
(3) Water Quality
(4) Water Supply
(5) Farm and Urban Agriculture
(6) Industry and Manufacturing
(7) Seafood Industry
(8) Hydro Power
(9) Thermal Power
(10) Local Government
(11) Environmental and Conservation
(12) Business and/or Economic Development
(13) Historic and Cultural
(14) Other

"The ACFS, due to its organization and make-up, brings together the most knowledgeable, diverse group representing all water interests in the ACF watershed. A positive outcome from the ACFS has the best chance to be a workable solution for the 20-year-old water dispute."

Billy Turner, Former Columbus Water Works Director, ACFS Chair, Middle and Lower Chattahoochee Sub-basin

Each of the four sub-basin caucuses appoints two members to the ACFS Executive Committee, serving as the organization's Chair, Vice Chair, Secretary, Treasurer and four executives-at-

large. The Governing Board and Executive Committee are tasked with addressing issues that benefit the entire ACF Basin and recommending positions supported by all stakeholders. The organization is hard at work developing a unified voice, incorporating stakeholder input to build a consensus-based, basin-wide vision. The group understands that plans must be developed to benefit every user – and any solution short of that is not sustainable. The Executive Committee and the Governing Board are assisted in their deliberations and consensus building by an administrator and a nationally recognized facilitator.

ACFS leaders believe that, while it may be challenging to reach consensus at times, positions that represent a consensus view will have a much greater impact. State and federal agencies have a well-established history of listening to significant constituent voices, and ACFS looks forward to building goodwill and political support for its initiatives going forward. The ACFS's democratic, collaborative approach is distinctly different from any other effort within the tri-state area, and it offers an unprecedented opportunity to reach a long-term solution to the long-standing problem of water allocation.

Figure 2 - ACFS Technical Oversight and Coordination Working Group at the "Unimpaired Inflow" Workshop in Columbus, Georgia

Beginnings of an Action Plan

In March 2011 at the ACFS Governing Board meeting in Apalachicola, Florida, the Board approved a 2011 Annual Plan and a Five-Year Action Planning Program. These strategic documents established the top priorities for the organization to address as it works to develop a sustainable water resource management plan for the ACF basin. The group began to develop a scope of work for consultant help in developing a plan. This scope of work included hydrologic modeling to investigate and help the group understand the impact of potential recommendations and to assist in identifying management practices that could alter the current operations to better satisfy the conflicting needs stakeholders have for water resources in the basin.

The ACFS worked on the consultant selection and contracting tasks through late October 2011; the group ultimately choose two consulting teams to support the effort: Black & Veatch for the sustainable water management plan and Atkins for the Instream Flow Assessment. The instream flow assessment is an integral part of the development of a sustainable water management plan to address the environmental aspects of water management in the basin. Work on these tasks began in November 2011 and is continuing.

Sustainable Water Management Planning

The scope of work developed by the ACFS outlined a framework for development of the sustainable water management plan through eight tasks:

1. Detailed Work Plan and Milestones and Sustainable Water Management Plan Outline
2. Problem Definition, Clarification of Needs and Interests, and Definition of Performance Indicators/Metrics
3. Tailoring of a Collaboratively Developed Model Based on Interest-Based Performance Indicators/Metrics
4. Data and Information Gathering
5. Development of Water Management Alternatives
6. Conduct Iterative Modeling to Evaluate Alternatives Against the Performance Indicators/Metrics
7. Seek Consensus on One or More Management Alternatives
8. Report and Study Dissemination

The initial desire was to develop the sustainable water management plan in a one-year time frame. However, the need to generate funds for the work, as well as the identification of additional work items, and the significant need for additional meetings and discussions of the group as the work progressed have all acted to lengthen the execution time for this effort. Figure 3 illustrates the eight tasks and project timeline.

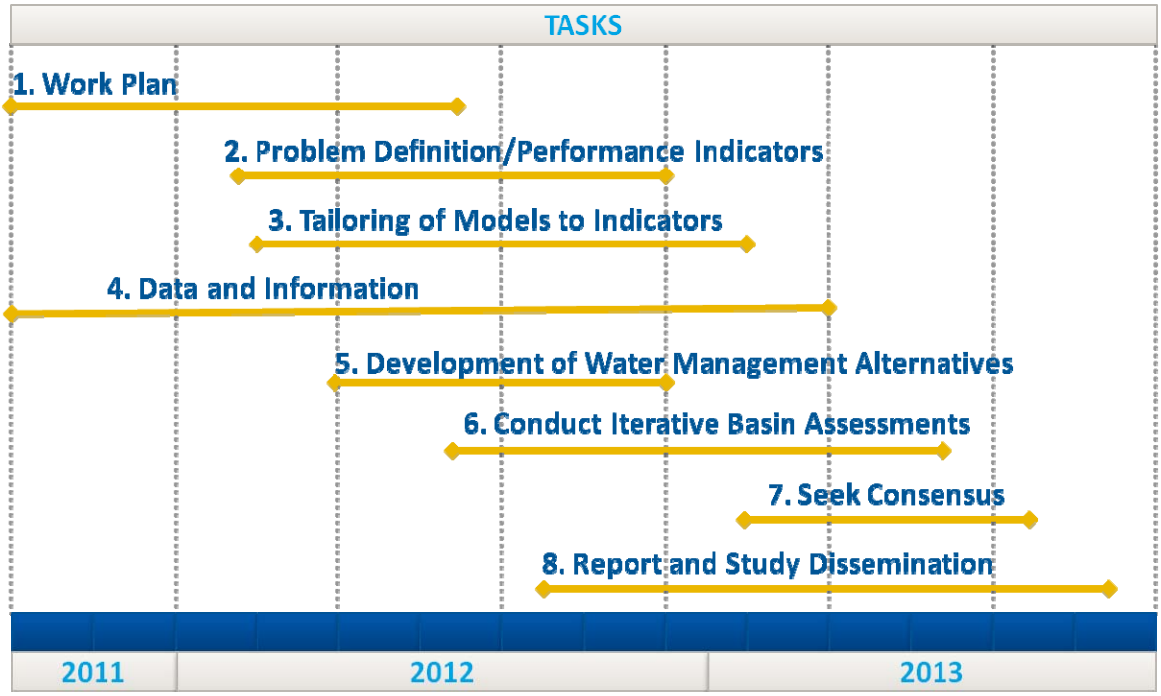

Figure 3 - Overall Summary Schedule

Work and Findings Completed to Date

Task 1

The sustainable water management plan effort began with the first task, the development of a detailed work plan. This work plan detailed each of the eight tasks and defined specific deliverables. While not listed as a separate task, the workplan included the data review and instream flow assessment activities assigned to Atkins as part of Task 4, Data and Information Gathering.

A schedule for the project was developed in Microsoft Project format to graphically describe the sequence, length and interrelationship between tasks. Major milestones were identified, and regular meetings of the ACFS Governing Board were also included in the schedule so that the group could understand the kinds of activities, and therefore the discussion and feedback opportunities, that would be involved at each Governing Board meeting.

The workplan also included the proposed budget for the project broken down by task and the initial draft of the Sustainable Water Management Plan Outline to allow the group to visualize what the plan deliverable would ultimately look like.

As the workplan was being developed, the project team recommended the formation of a Technical Oversight and Coordination Work Group (TOCWG) as a smaller group to represent the Governing Board in the ongoing work on the plan. The TOCWG was structured similarly to the Governing Board, with two representatives and a backup from each of the basin caucuses. Representatives were chosen for their technical expertise and their representation of varied interest groups. This ensured that the geographic and stakeholder diversity in the Governing Board was carried through to this technical committee. This group has been assisted by a facilitator knowledgeable in regional water issues. This committee and a description of the interactions of this committee and the project team were included in the second draft of the work plan.

The workplan went through several iterations, with many discussions at the TOCWG, Executive Committee, and Governing Board levels. As subsequent tasks were performed, additional work efforts that the ACFS decided to recommend were identified. Later versions of the workplan included a section on “Recommended Additional Work Efforts” to capture this input; the latest version of the workplan that has been approved is dated September 4, 2012.

<u>Task 4</u>

Task 4 included several elements, including a literature review of environmental studies and information and an instream flow assessment, a review of the latest Unimpaired Inflow dataset that was used by the US Army Corps of Engineers (USACE) in their system modeling, and a compilation of the latest information on water withdrawals and demands in the ACF basin.

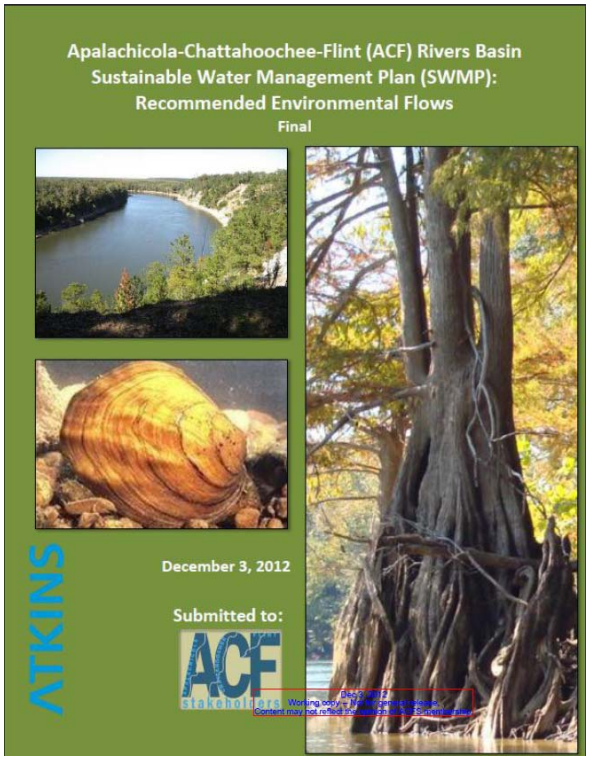

Figure 4 - Instream Flow Assessment

The literature review of environmental studies was performed first, and coincided with the development of the workplan. This task deliverable was a searchable spreadsheet database of pertinent environmental studies. The instream flow assessment was performed for the Apalachicola based on a review of previous environmental studies, and included the development of recommendations for flows for the overall system based on the presumption that floodplain connectivity should be within 15 percent of “natural” flow regime to protect habitat. These floodplain connectivity levels were converted to corresponding monthly median and mean flows. This approach is still

under consideration by the ACFS.

The unimpaired inflow dataset is a model input, a data series based on USGS flow gage data, modified by calculation to remove specific human effects, including reservoir construction (and resulting evaporation), reservoir release operations, and withdrawals and returns. The existing unimpaired inflow dataset was developed by the USACE and has been the source of many comments and criticisms. The methods and results of this development process were critically reviewed, and compared to alternative methods, such as the update/extension performed by Georgia Environmental Protection Division. A report detailing the comparisons, describing the method development, and suggesting improvements to the dataset development was produced. The ACFS considered the recommendations of this task, and while recognizing that future improvements to the dataset are desirable, directed the project team to move ahead with the effort based on the USACE dataset. This will provide greater consistency between the modeling results prepared for the sustainable water management plan and previous USACE modeling work, and eliminate the schedule impacts and funding requirements to accommodate this additional work. It is expected that the final sustainable water management plan will include a recommendation that this dataset be improved in the future.

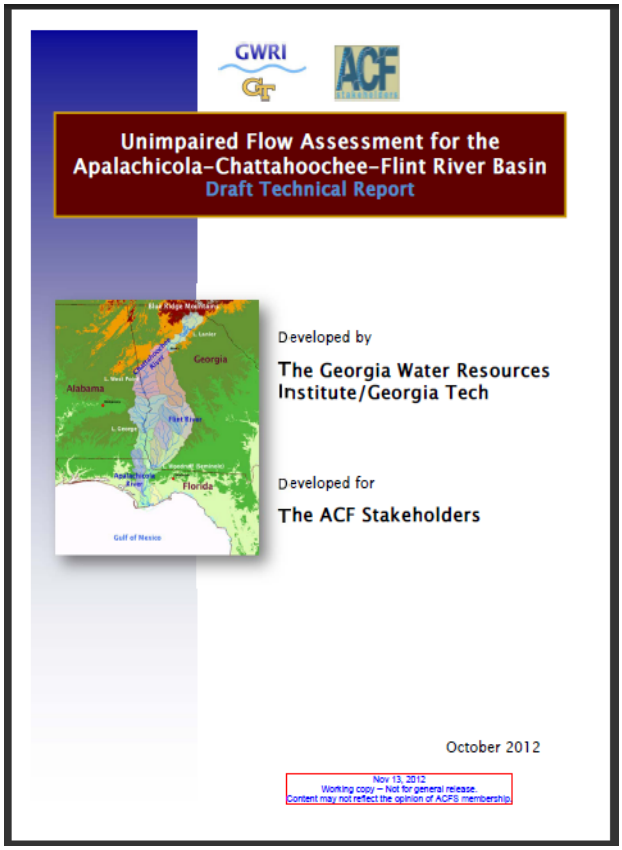

Figure 5 - Unimpaired Flow Assessment

The water withdrawals and returns are another model input. This task was performed by contacting the state agencies in Alabama, Florida, and Georgia to procure the latest permit information, estimates of current use, and estimates of future water uses. Because of permitting differences between the three states, the information sources, years of record, and quality of information varied. For example, Florida requires agricultural withdrawals to submit monthly withdrawal information; Georgia requires agricultural withdrawal permits, and is working to finish installation of meters on withdrawals that are currently being read annually. Future projection years also varied between the states; Alabama provided feedback that no projections were available, and Florida and Georgia had projections for different years.

This information was reviewed, and withdrawal and return data was compiled. Where information was missing, the best available information was used. A “current” water demands and returns dataset was calculated, as well as projected withdrawals and returns through 2050. These datasets were provided to USACE, USGS, state agencies, and stakeholders for review and input. A finding surprising to some stakeholders was that agricultural withdrawals and the surface water impacts of groundwater withdrawals in southwest Georgia (primarily for agriculture) combine to be the largest component of annual average water use.

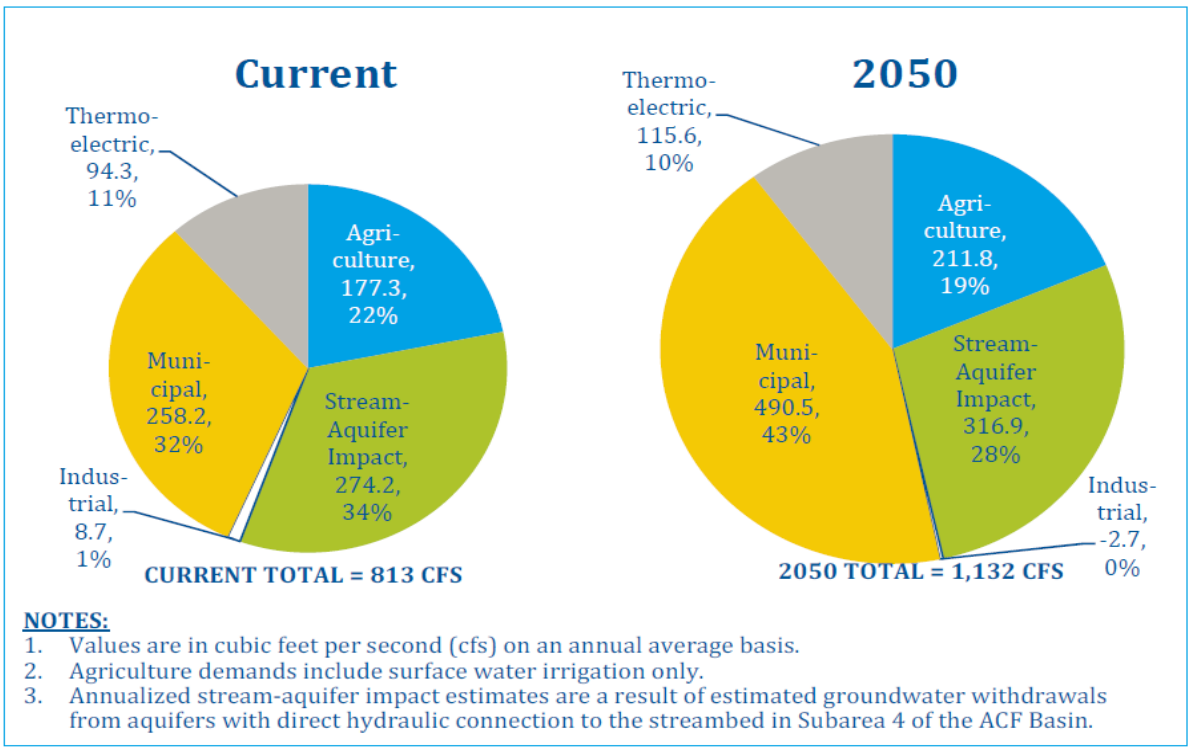

Figure 6 - Annual Average Basin Consumptive Demands

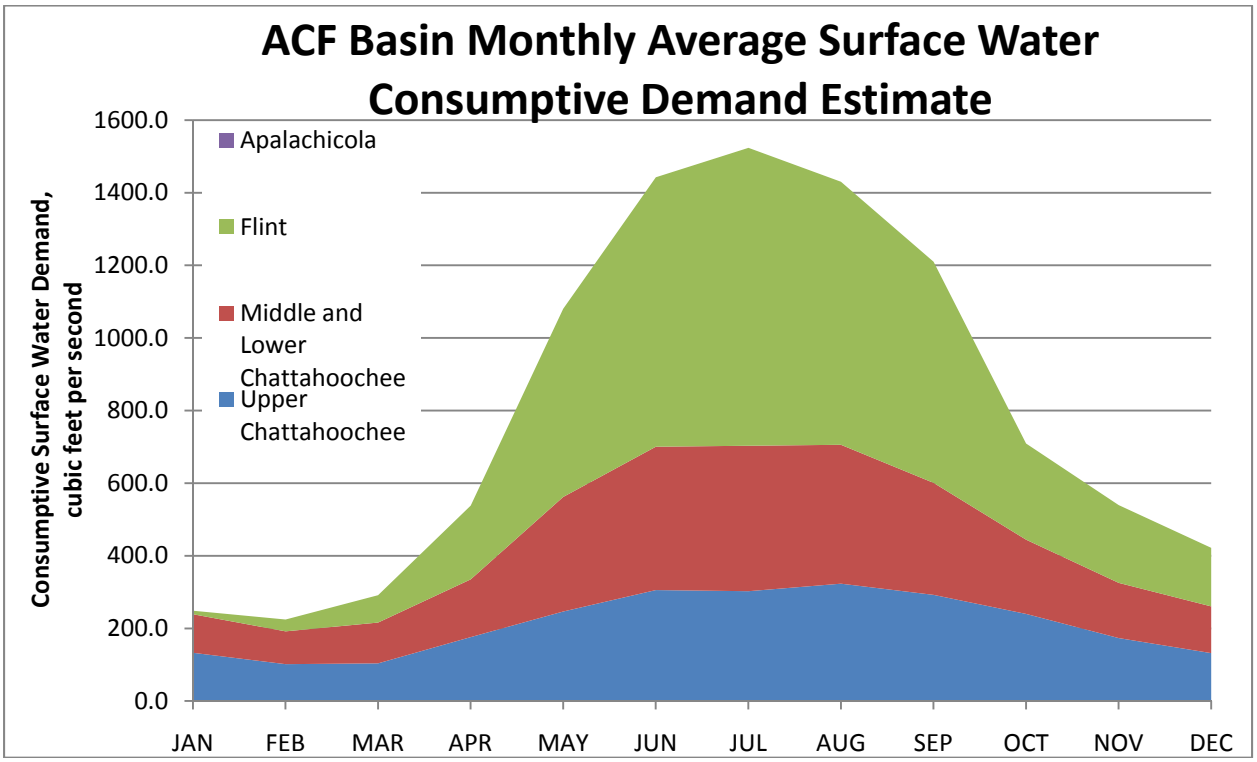

Figure 7 - Monthly Average Basin Consumptive Demands

Task 2

The project team pursued a matrix approach to defining performance metrics; through multiple basin caucus and TOCWG meetings, the desires of stakeholders for each of the 14 defined

stakeholder interest groups, for each of the modeling nodes, was discussed. Desires of the stakeholders were captured in the matrix, and the project team worked to help express desires in numeric terms that could be incorporated in the model or which the model results could be formatted to provide information on. For example, desirable water flows into the Apalachicola Bay from an oyster perspective were identified; high flows above flood level at the Blountstown gage is a trigger for a shutdown of oyster harvesting, so this level was converted into a corresponding flow reading. The model run output will then be used to calculate the percentage of time that flows are managed below this level, and this metric can be used to highlight differences between different water management alternatives in various model runs.

Not all stakeholder interests are able to be modeled numerically within the sustainable water management plan effort. For example, there are a number of hourly or instantaneous flow desires of various stakeholders, including recreation, hydropower, and environment interests. The system modeling being performed is at a larger time resolution, so this input was gathered and documented for consideration in the narrative recommendations of the sustainable water management plan. It is expected that the sustainable water management plan will include a recommendation for future numeric modeling to address finer timescale operations.

Node / Gage/Metric	Lanier/Level	Lanier Outflow/ Flow	Buford Gage / Flow	Norcross / Flow	Morgan Falls	Peachtree Creek / Flow
Navigation	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Recreation	Percent of Time Lanier Level is <1061, UC Caucus Metric 10 - Percent of Weeks March through Nov < Corps Identified Recreation Impact Levels	Linked to Water Supply and Hydropower	Percent of time >1500 cfs into Bull Sluice Lake (Atlanta Rowing Club); hourly variability is a concern	Percent of time level > elevation 864 (Atlanta Rowing Club Input)	% of time flow between 1000 and 1250 cfs for recreation (National Park Service)	Percent of Time Lanier Level is <1061, UC Caucus Metric 10 - Percent of Weeks March through Nov < Corps Identified Recreation Impact Levels
Water Quality	Concerns with lake level and water quality; generally better water quality with higher lake levels	GA DNR hatchery desired release = 550 cfs to keep nursery intake covered, DO, temp	No Specific Criteria Identified	No Specific Criteria Identified	750 cfs or greater throughout the year; releases to meet this flow with current discharge limits generally protective of DO and temperature	Concerns with lake level and water quality; generally better water quality with higher lake levels
Water Supply	UC Caucus Metrics 1-9	UC Basin Caucus Metric 11 - Number of Days with Shortages of Withdrawals	UC Basin Caucus Metric 11 - Number of Days with Shortages of Withdrawals	UC Basin Caucus Metric 11 - Number of Days with Shortages of Withdrawals	UC Basin Caucus Metric 12 - Percent of Days Below 750 cfs	UC Caucus Metrics 1-9
Farm Agriculture	No Specific Criteria Identified	No Specific Criteria Identified	No Specific Criteria Identified	No Specific Criteria Identified	No Specific Criteria Identified	No Specific Criteria Identified

Figure 8 – Example Stakeholder Metrics by Node

Task 3

Task 3 has been recently completed. Performance metrics identified by the ACFS have been set up to automate calculation in many cases, and to streamline manual calculations in other instances. Additional performance metrics are identified by the group through the future tasks may be programmed for automation or may simply be calculated manually for specific runs.

Task 5

The project team has begun work collecting water management alternatives that the ACFS desire to be considered as alternates to current operations. Online and hardcopy feedback on alternatives have been solicited from all four basin caucuses, and the information collected to date has been summarized in a draft technical memorandum. Alternative operation or scenario suggestions are being categorized into changes in water withdrawals, returns, storage, and reservoir operations; these are the types of changes that can be affected on the system through modifications. The TOCWG's next task will be to screen the wide variety of alternatives into the specific choices for the limited modeling effort. Many of the alternatives can be modeled singly or in various combinations. The final plan is expected to contain a portfolio of water management strategy recommendations, and these can be modeled together. However, as in any modeling effort, making one change at a time allows reviewers to understand the ramifications of individual recommendations better. Since the modeling budget is limited, balancing the number of alternatives with the desire to model individual changes will be challenging.

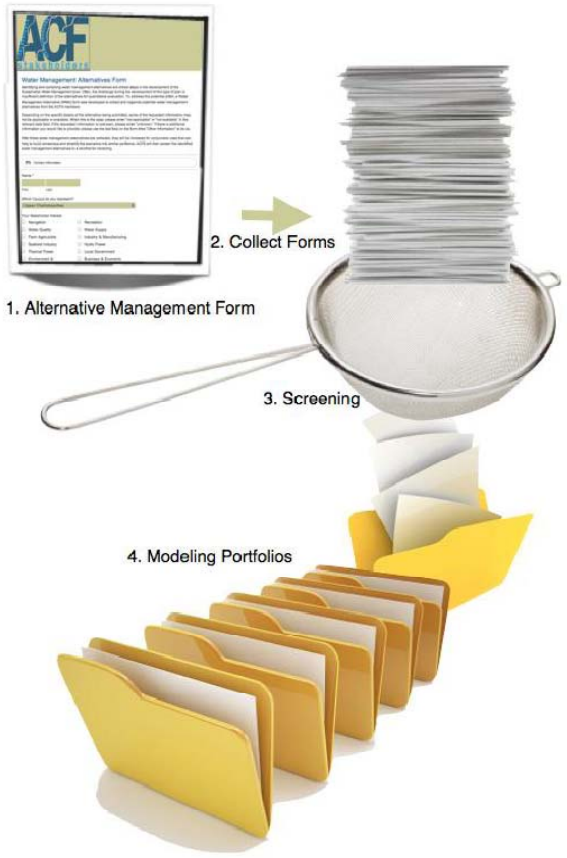

Figure 9 - Management Alternatives Screening Process

Task 6

The project team has already completed the baseline modeling. An approach including a series of four runs was utilized to allow comparisons and increase understanding of the relative magnitudes of various effects. The first run was of the unimpaired inflow series with no reservoirs or consumptive demands. The second run added in the effects of reservoir construction to illustrate evaporative effects. The third run added in the current reservoir operational rules, and the fourth run added in the "current" consumptive demand estimate. As the modeling was underway, additional runs were added to answer three additional questions about the range of evaporation, how the operational revisions as modeled by the USACE in its Remand Report compared to existing Revised Interim Operating Procedures (current operations, designated as the RIOP), and finally, how the statistical answers derived from modeling these conditions over the entire period of record change during the very dry years in the period of record.

The results of the modeling have been presented to the TOCWG, and review is underway. Many of the results document expected results; ie the impact of system regulation are evident, and are numerically greater upstream in the watershed, diminishing significantly downstream in the watershed. Another finding surprising to some is that the differences between alternatives may not be as easy to distinguish, particularly under average conditions; therefore, reviewing results under dry to very dry conditions may be necessary to distinguish significant differences between runs. Additional understandings are expected as the group continues to review the results, and in particular as suggested water management alternatives are compared to these baseline results in the future.

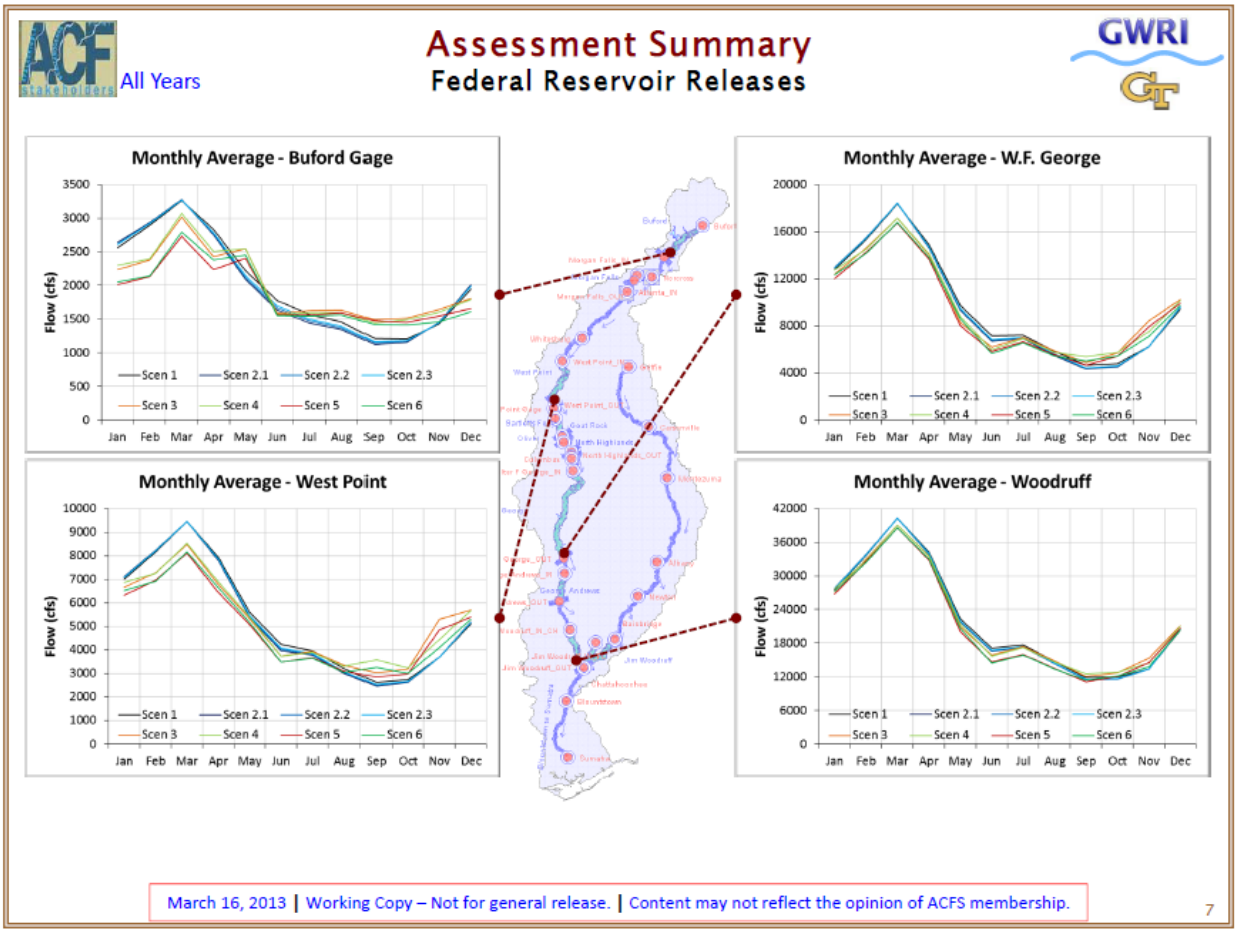

Figure 10 - Baseline Assessment Model Run Comparisons Example

This task also includes modeling, in three iterations, water management alternatives. The purpose of this modeling is to develop numeric comparison of flows and levels under alternative management strategies to allow comparison to baseline conditions. This work is currently being planned.

Task 7 and 8

The ACFS has not yet begun work on tasks 7 and 8, which will be executed in parallel with modeling of the water management alternatives.

Summary

The group objective of consensus and the task by task execution approach that the group has pursued, in part necessitated by the availability of funding, have both impacted the project schedule. Initially desired to be completed within a one year timeframe to allow the recommendation of a plan to the USACE for consideration in their update of the basin operating plan, the plan execution is optimistically projected to be at least two years. However, the ACFS, and the TOCWG in particular, are benefiting from the working relationships being forged through the many conference calls, workshops, and meetings. These relationships are necessary to build the trust between stakeholders who represent competing interests to allow them to strive for agreement as much as possible and to clarify and articulate differences that remain for continued future progress.

The ACFS has made great progress on accomplishing the goals of the Sustainable Water Management Planning effort; however, much hard work remains. Developing consensus among the members given the intentional inclusion of diverse stakeholder interests will continue to be a difficult task, but this concerted effort to reach agreement is what makes the group a powerful voice of reason against the backdrop of decades of litigation. The ACFS continues to persevere in the development of a truly sustainable water management plan that will include recommendations for improved water management to the USACE, the three states, and water users in the basin.