



Surface Water Quantity Models

Kickoff Meeting Agenda

September 10, 2014

1. Introductions

2. Project Overview

- a. Scope review
- b. Intended Model Uses
- c. Priority of Basins and Schedule
- d. Critical Success Factors

3. Stakeholder Meetings and Approach

- a. Proposed Approach
 - i. Meeting 1 – Project Introduction and Data Needs
 - ii. Meeting 2 – Confirm\Refine Data and Address Critical Issues/Gaps
- b. Vision for Overall Stakeholder Process

4. Approach to Developing Unimpaired Flows

5. Simplified Water Allocation Model (SWAM)

- a. Model Overview
- b. Demonstration and Examples
- c. Web Accessibility Options

6. Other – Questions, Comments, Closing Remarks

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1. Introductions

Attendees Included:

<i>From CDM Smith:</i>	<i>From DNR:</i>	<i>From DHEC:</i>
John Boyer	Ken Rentiers	David Wilson
Kirk Westphal	Joe Gellici	David Baize
Tim Cox	Andy Wachob	Chuck Gorman
Dave Collins	Scott Harder	Rob Devlin
Fred Yandle	Bill Clendenin	
Bernadette Kolb		
Stuart Timmons		
Elizabeth O'Sell		

2. Project Overview

Modeling Objectives and Model Uses

CDM Smith reviewed the model uses, as stated in the solicitation. These included:

1. Evaluate surface-water availability in support of the new Surface Water Withdrawal, Permitting, Use, and Reporting Act;
2. Predict future surface-water availability using projected demands;
3. Develop regional water-supply plans;
4. Test the effectiveness of new water-management strategies or new operating rules; and
5. Evaluate the impacts of future withdrawals on instream flow needs and minimum instream flows as defined by regulation.

DHEC and DNR staff expanded on these stated uses through a discussion of the following additional potential model uses:

- Comparing managed flows to natural flows when evaluating rivers.
- Performing Current Situation Analysis: Probabalistic analysis of current conditions and how they are likely to change within 6 or 12 months (for example) by running 1-year sequences of historic hydrology and resetting initial storage/flow conditions with each run. This is not currently a model feature; however, CDM Smith has programmed this in similar models in the same programming language (VBA).
- Porting near-term hydrologic flow forecasts (from NOAA) into model. This can be done, but is not automated.

- Developing contingency plans for new industrial users – for example, determining how often they would need to use alternate sources due to new streamflow regulations.

Critical Success Factors

CDM Smith staff, during an earlier an internal Project Quality Meeting, identified the following critical success factors for the project:

- Data Collection
We must develop an efficient data management plan that is appropriate to the model scale that clearly defines period of record, identifies critical data, and documents the sources of data collected.
- Internal Communications/Staff
We must develop and follow an established internal communication approach with a dedicated team of appropriate skills and staff mix to ensure consistency in execution and continually address all Critical Success Factors.
- Unimpaired Flows
We must achieve agreement on a consistent methodology to develop unimpaired flows, and also agreement on the results
- Modeling Plan/Pilot Model
We must use the piloting task and modeling plan to develop a sound, clear and transferable approach template and gain client confidence and consensus.
- Stakeholders
We must understand our role and work with the client and facilitator to help build understanding and agreement on technical approach and model development.
- Technical Models
We must clearly define and achieve model requirements to meet the overriding objectives and stated future uses of the models, with a focus on model robustness, usability, transferability, defensibility and flexibility.
- Quality
We must follow CDM Smith’s Quality Management Procedures (QMP), which include careful review and quality control of the products to ensure the highest quality before releasing to the client and public.
- Scope/Schedule/Budget
We must thoroughly understand project scope and schedule, including deliverable dates, and adjust accordingly during project execution to control variances.

In response to the question, “*What will make this project successful?*”, DHEC and DNR attendees offered the following measures of success:

- The project will be successful if the models are useful in demonstrating and communicating results to non-technical decision makers and all water users.
- The project will be successful if stakeholders buy in to the process.

- The project will be successful if model users are able to trace impacts of water management throughout the entire basin and determine how much water is available at any given point.
- The project will be successful if the models are capable of producing reliable information for all users, including environmental groups, and not just decision makers.
- The project will be successful if the models can demonstrate the effects of withdrawals in a basin for purpose of making scientific permit decisions.
- The project will be successful if the models are user friendly and transportable from person to person, especially new staff who may not participate in the model development process.
- The project will be successful if the models are scientifically defensible and receive universal buy-in.

Data Collection

- South Carolina Farm Bureau and USDA may be consulted regarding historical ag/irrigation data; however, it was noted that surveys of ag water use typically only receive a 25% response.
- It was suggested that most ag/irrigation use has been from groundwater sources and that surface water use for ag/irrigation may be minor (except in certain basins).
- DHEC offered to send a letter to permitted water users making them aware that CDM Smith will be contacting them to obtain historical water use and other data.
- DHEC noted that there are currently 197 registered M&I users in the state and 40 registered agricultural users in the state.
- Noel Hurley with the USGS was identified as a useful contact regarding USGS gage data.
- NCDENR DWR (Tom Fransen) can be contacted regarding NC basin models and the UIF datasets. The Catawba-Wateree Working Group can be contacted for the Catawba-Wateree CHEOPS model and its UIF dataset.

Model Order and Schedule

- Because the Broad feeds into the Saluda, unimpaired flows for the Broad will need to be developed simultaneous with the Saluda.
- The following order was agreed to for model initiation and completion. 1. Saluda; 2. Edisto; 3. Broad; 4. Pee Dee; 5. Catawba; 6. Santee; 7. Savannah; and 8. Salkehatchie. It was recognized that this order may be altered depending on future issues and factors.
- NCDENR DWR can be consulted regarding the schedule for completion of North Carolina basins which feed into the Pee Dee.

Other General Items

- Water users have drought contingency plans which specify an alternative source of water. Once instream flow is below the regulatory threshold (20%, 30%, or 40% of a

threshold value, depending on month), users are required to switch to alternative water source.

- Potential industrial water users may want to use the model to evaluate permitability.
- The ACOE has specified four drought levels, each with multiple rules, for the Savannah River system. Flow out of Lake Thurmond controls the amount available to the lower Savannah.
- If there are tributaries that may not be able to support 100,000 gallons per day, it still may be useful to have them explicitly represented in the model. Explicit inclusion of tributaries in the model (as opposed to implicit inclusion in larger mainstem reaches) should be based on the current and future potential of the tributary to support withdrawals.
- Water is being used as an economic driver in the South Carolina.
- 2012 streamflow regulations would apply to new users, but not necessarily to existing users. These can be easily prioritized as such in the model.
- “Future forecasting” for scenario development refers primarily to long-term planning for growing demand.

3. Stakeholder Meetings and Approach

DHEC and DNR Directors have expressed their desire for the model development process and team to focus exclusively on technical issues, and for the stakeholder interaction to be managed by an independent, expert firm.. As such, DNR and DHEC are currently seeking a qualified contractor to organize and facilitate stakeholder engagement, and build trust. The contractor will shadow the modeling contractor as the work progresses and organize stakeholder engagement at appropriate times. CDM Smith’s scope of work covers participation in up to two stakeholder meetings per river basin. Once the contractor is selected, CDM Smith will meet the contractor, DHEC and DNR to discuss and help develop the stakeholder involvement program, and identify appropriate roles and responsibilities for the two firms.

4. Approach to Developing Unimpaired Flows

Kirk Westphal reviewed a process flow diagram depicting the draft approach to developing unimpaired flows. DNR and DHEC staff added the following:

- There is a desire to show a historical progression of water use compared to available flows, especially in the Edisto. This will be possible once the unimpaired flow (UIF) datasets are developed.
- Characterizing UIFs through the 50’s drought of record is important. Developing UIFs back as far as possible is important since recent years have been colored by several droughts (this is useful for helping to “unbias” results away from frequent drought conditions in the past 15-20 years)
- It was noted that the method for developing UIFs in Georgia added back in runoff to a reservoir (via estimates), for the time period prior to when the reservoir existed.

- CDM Smith should note where USGS flow gages that currently do not exist, or no longer exist, would be useful to support modeling.
- DNR and DHEC desire inclusion of hydrologic records going back as far as possible to facilitate statistical interpretation of historic hydrologic conditions. Gap filling should extend through longest gaged period. Also, permits are based on mean annual flow (at any point, presumably not unimpaired), and the longer the period of record at any point, the more representative this number can be.

5. Simplified Water Allocation Model (SWAM)

Tim Cox provided an overview of SWAM, demonstrating both the completed Arkansas River Basin model and an early (partial) representation of the Saluda River Basin model. The following potential enhancements were noted:

- Adding USGS gages as output nodes with a unique graphical icon.
- Consider adding statistical feature for current situation analysis (as previously described).

DNR requested a copy of SWAM to begin experimenting with flexibility and learning to navigate.

6. Other – Questions, Comments, Closing Remarks and Action Items

- John Boyer/CDM Smith will send out an invite for a recurring monthly status update call with the DNR and DHEC staff. Status should include screen sharing, when applicable.
- John Boyer/CDM Smith will provide a sample monthly invoice to Joe Gellici/DNR. The monthly invoice should be submitted to DNR at least seven days prior to the monthly status call.
- DHEC will prepare and distribute a letter to permitted water users making them aware that CDM Smith will be contacting them to obtain historical water use and other data.
- CDM Smith will provide a copy of SWAM to DNR so that they begin navigating and understanding the tool.