



Surface Water Availability Assessment in South Carolina Legislative Quarterly Report, November 2014

Background

South Carolina currently has limited scientific information about the future demands on and availability of our water supply. As a result, the General Assembly allocated \$1.5M to complement South Carolina's new surface water permitting program administered by SC Department of Health and Environmental Control (DHEC), and to gather the information necessary to update the State Water Plan developed by SC Department of Natural Resources (DNR). The two agencies are in the process of gathering data on South Carolina's eight basins: Broad, Catawba, Edisto, Pee Dee, Salkehatchie, Saluda, Santee, and Savannah.





Scientific Process for Measurement and Legislative Reporting

The availability assessment will develop a computer-generated model of each of the eight basins to evaluate existing water availability. These analyses will be used to inform the resource agencies and stakeholders if there are areas of the State where there is a “gap” or concern about the amount of water needed to meet our increasing demands over the next 50 years.

The funds appropriated above to the DNR for the State River Basin Study Project must be used for water data collection to provide scientific information on water resources in the state's eight major river basins. The DNR shall, in cooperation with DHEC, submit to the Senate Finance Committee, the House Ways and Means Committee, the Senate Agriculture and Natural Resources Committee, and the House Agriculture, Natural Resources and Environmental Affairs Committee, a report on the project's timeline, findings, and expenditure of funds on a quarterly basis. Additionally, this information will be posted electronically on DNR and DHEC websites.

Summary of Activities During the Past Quarter

On July 11, 2014 a selection panel selected CDM Smith, Inc. as the modeling contractor for the project. A Notice to Proceed, marking the official start date, was granted on August 15, 2014. The project is scheduled to be completed by August 15, 2016.

CDM Smith's *Simplified Water Allocation Model (SWAM)* will be used for the project. The Saluda River basin will serve as the pilot study area and will be the first basin model developed. This model is scheduled to be completed by the end of June 2015. Data collection has commenced for the Saluda and for the other seven basins. A modeling plan was developed by CDM Smith and reviewed by DNR and DHEC. It is posted on the DNR Hydrology webpage. Progress reports are being presented by CDM Smith at monthly conference calls made to DNR and DHEC, and written monthly progress reports are being posted on the DNR Hydrology webpage. In addition to the monthly progress reports, CDM Smith is required to prepare quarterly progress reports, the first of which is provided below. Financial statements can be found at the end of this report.

South Carolina Surface Water Quantity Models Quarterly Progress Report No. 1

August 15 to November 15, 2014

Introduction

The South Carolina Departments of Natural Resources (DNR) and Health and Environmental Control (DHEC) have contracted with CDM Smith to develop surface water quantity models in the eight major river basins in South Carolina. Per the requirements of the contract, CDM Smith will prepare and submit Quarterly Progress Reports summarizing work completed on each basin model. This first Quarterly Progress Report covers the project's initial three month period from August 15, 2014 to November 15, 2014.

The Quarterly Progress Report provides a bulleted summary of activities and accomplishments; identifies upcoming work and deliverables; highlights issues that have the potential to impact scope, schedule or costs; and provides the current project schedule. Activities and accomplishments are presented for the following categories: (1) project planning and management; (2) data collection; (3) data analysis and modeling; and (4) stakeholder involvement.

Activities and Accomplishments

Project Planning and Management

- An introductory meeting between CDM Smith, DNR and DHEC staff was held on August 7th. The purpose of the introductory meeting was to begin project planning activities, including establishing a kickoff meeting agenda, data, and location.
 - A Project Kickoff Meeting attended by the CDM Smith project team, DNR, and DHEC was held in CDM Smith's Columbia office on September 10th. The Kickoff Meeting covered the following topics:
 - modeling objectives and model uses;
 - project critical success factors;
 - data collection and data sources;
 - a preliminary order and schedule for modeling each basin;
 - the proposed methodology for developing unimpaired flows (UIFs); and
 - a demonstration of the Simplified Water Allocation Model (SWAM).
- Kickoff meeting notes and presentation slides were circulated to all meeting attendees on September 23rd.
- A draft Modeling Plan was submitted to DNR/DHEC on October 14th. Following receipt of DNR/DHEC comments, a final Modeling Plan was submitted on November 14th.

- Monthly Progress calls attended by CDM Smith and DNR/DHEC project staff were held on October 6th and November 3rd.

Data Collection

- The following DHEC-provided data and related information were reviewed and organized:
 - Monthly water use records for permitted M&I, hydropower, and agricultural users
 - Non-active (or non-permitted) historical water use records
 - Monthly NPDES discharges
 - GIS shapefiles with active and former withdrawal and active discharge locations
- USGS discharge data for active and former gages statewide were downloaded and organized.
- Statewide GIS files (hydrography, basins, county/municipal limits) from DHEC, DNR, USC, and other sources were obtained and organized.
- CDM Smith began contacting registered water users in the Saluda basin to confirm reported withdrawal amounts, sources, and discharge amounts; collect pre-reporting withdrawal amounts (or estimates); and confirm other operational parameters.
- A step-wise approach to estimating historical agricultural irrigation withdrawal amounts was prepared. The approach was reviewed with DNR and DHEC staff.

Data Analysis and Modeling

Saluda (Pilot Basin Model)

- Several UIF methodologies were reviewed and a process diagram outlining the proposed methodology was developed. CDM Smith began development of a draft methodology document for developing UIFs in the Saluda basin.
- A timeline of historical gaged flows was developed.
- A preliminary SWAM model schematic and framework was developed, primarily for demonstration purposes during the kickoff meeting. The framework will be finalized once data collection is completed in the basin.
- SWAM model enhancements to incorporate daily time step were initiated.

Edisto

- A timeline of USGS discharge data for active and former gages was developed.

Broad

- A timeline of USGS discharge data for active and former gages was developed.

Pee Dee

- A timeline of USGS discharge data for active and former gages was developed.

Catawba

- A timeline of USGS discharge data for active and former gages was developed.

Santee

- A timeline of USGS discharge data for active and former gages was developed.

Savannah

- A timeline of USGS discharge data for active and former gages was developed.

Salkehatchie

- A timeline of USGS discharge data for active and former gages was developed.

Stakeholder Involvement

- John Boyer, CDM Smith's Project Manager attended the South Carolina Water Resources Conference and co-delivered a presentation with Ken Rentiers of DNR. The presentation reviewed the project schedule and provided an overview of SWAM.
- As previously noted, CDM Smith began contacting registered water users in the Saluda basin to confirm and collect pertinent information about their water withdrawals.

Summary of Upcoming Work

Over the next quarter, the project team will:

- Continue with data collection with the focus on contacting permitted users in the Saluda, Edisto, Broad, and Pee Dee river basins to obtain historical water use and related data.
- Following the proposed step-wise approach, develop historical agricultural water withdrawal estimates for all basins. Minor adjustments to the approach may be made, as deemed necessary.
- Continue development of methodology to prepare the UIF dataset for the Saluda Basin (due December 1st)
- Finalize incorporation of the daily time step and development of the Saluda Basin model framework (due January 15th).
- Prepare for and participate in a Panel Discussion along with DNR and DHEC staff at the South Carolina Rural Water Association's Decision Makers Summit on February 27th, 2015.
- Assist in developing and executing a stakeholder involvement plan with the DNR-procured project stakeholder facilitator.

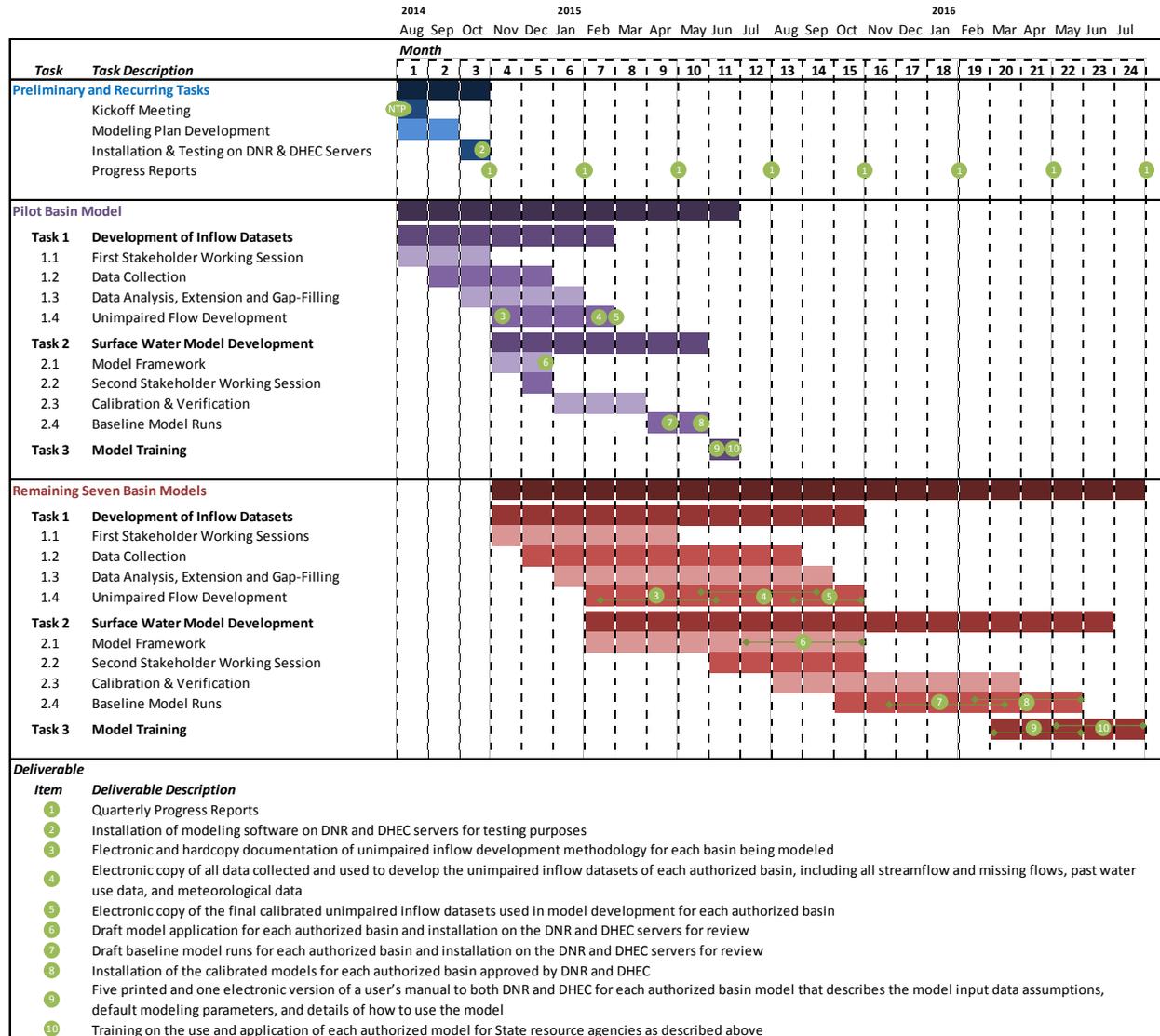
Issues Impacting Scope, Schedule, or Project Cost

No issues were identified during the previous quarter which might impact schedule. During the project kickoff meeting, and based on DNR and DHEC review of the draft Modeling Plan, several potential out-of-scope model enhancements were identified. These include:

- A “Current Situation Analysis” for quasi-real time operational support. This functionality would provide a probabilistic analysis of current conditions at any future point in time and how conditions are likely to change within 6 or 12 months based on projected use and management patterns.
- The ability to use near-term hydrologic flow forecasts (for example, 60-day streamflow forecasts from NOAA) for month-to-month operational planning.
- Use of HEC DSSVue for and DSS files for results display and analysis.

CDM Smith will solicit input from stakeholders and future model users, and discuss the expected level of effort with DNR and DHEC, so that decisions can be made about prioritizing and implementing these possible future enhancements as the project moves forward.

Project Schedule





CDM Smith Invoice Number 1

Invoice Date: September 23, 2014
 For Services Between: August 15, 2014 and September 13, 2014

River Basin	Contract Amount	This Invoice	Total Invoiced	Amount Remaining	Percent Complete
Saluda	\$155,926.00	\$7,984.00	\$7,984.00	\$147,942.00	5%
Edisto ¹	\$226,034.00	\$26,000.00	\$26,000.00	\$200,034.00	12%
Broad	\$132,960.00	\$-	\$-	\$132,960.00	0%
Pee Dee	\$189,865.00	\$-	\$-	\$189,865.00	0%
Catawba	\$141,639.00	\$-	\$-	\$141,639.00	0%
Santee	\$128,775.00	\$-	\$-	\$128,775.00	0%
Savannah	\$154,637.00	\$-	\$-	\$154,637.00	0%
Salkehatchie	\$128,775.00	\$-	\$-	\$128,775.00	0%
Total	\$1,258,611.00	\$33,984.00	\$33,984.00	\$1,224,627.00	3%

¹ Project startup-activities including the kickoff meeting, modeling plan, model enhancement and other activities were included under the Edisto Basin budget. The Edisto was originally identified as the pilot basin for modeling.

CDM Smith Invoice Number 2

Invoice Date: October 28, 2014
 For Services Between: September 14, 2014 and October 18, 2014

River Basin	Contract Amount	This Invoice	Total Invoiced	Amount Remaining	Percent Complete
Saluda	\$155,926	\$12,913	\$20,897	\$135,029	13%
Edisto ¹	\$226,034	\$12,550	\$38,550	\$187,484	17%
Broad	\$132,960	\$-	\$-	\$132,960	0%
Pee Dee	\$189,865	\$-	\$-	\$189,865	0%
Catawba	\$141,639	\$-	\$-	\$141,639	0%
Santee	\$128,775	\$-	\$-	\$128,775	0%
Savannah	\$154,637	\$-	\$-	\$154,637	0%
Salkehatchie	\$128,775	\$-	\$-	\$128,775	0%
Total	\$1,258,611	\$25,463	\$59,447	\$1,199,164	5%

¹ Project startup-activities including the kickoff meeting, modeling plan, model enhancement and other activities were included under the Edisto Basin budget. The Edisto was originally identified as the pilot basin for modeling.