



FEMA

SOUTH CAROLINA DEPARTMENT OF NATURAL RESOURCES COOPERATING TECHNICAL PARTNERS MAPPING ACTIVITY STATEMENT

Mapping Activity Statement No. FY10.15

In accordance with the Cooperating Technical Partners (CTP) Partnership Agreement dated September 20, 1999 between south Carolina Department of natural Resources (SCDNR) and the Federal Emergency Management Agency (FEMA), Mapping Activity Statement (MAS) No. FY10.15 is as follows:

SECTION 1—OBJECTIVE AND SCOPE

The objective of the Flood Map Project documented in this MAS is for the acquisition of terrain data (LiDAR) for to development of a Digital Flood Insurance Rate Map (DFIRM) and Flood Insurance Study (FIS) report for Kershaw, Saluda and Sumter Counties, South Carolina. All processes and deliverables shall be completed in accordance to the Federal Emergency Management Agency's (FEMA's) *Guidelines and Specifications for Flood Hazard Mapping Partners (G&S)* and effective Procedure Memoranda (PMs). These documents can be found on FEMA's website at http://www.fema.gov/plan/prevent/fhm/gs_main.shtm and http://www.fema.gov/plan/prevent/fhm/gs_memos.shtm.

The DFIRM and FIS report will be produced under a separate MAS in the FEMA Countywide format in the North American Vertical Datum of 1988 (NAVD88). (Refer to PM 41 for exceptions.)

This Flood Map Project will be completed by the following Mapping Partners:

- SCDNR;
- AECOM Water (Mapping and QA/QC Subcontractor); and
- URS Corporation (Mapping and QA/QC Subcontractor).

The Mapping Partner shall notify FEMA and all applicable parties of all meetings with community officials at least two weeks prior to the meeting (with as much notice as possible). FEMA and/or its contractor may or may not attend the community meetings.

The Mapping Partner shall maintain an archive of all data submitted. (All supporting data must be retained for three years from the date a funding recipient submits its final expenditure report to FEMA.)

The activities for this Flood Map Project, including any required Quality Control Requirements as outlined in PM 42, and the Mapping Partners that will complete them are summarized in Table 1.2, Flood Mapping Project Activities. The sections of this MAS that follow the table below describe the specific mapping activities, responsible Mapping Partner(s), FEMA standards that must be met, and resultant map deliverables.

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The SCDNR or its mapping contractor is responsible for the implementation of an independent Quality Assurance/Quality Control (QA/QC) plan for all assigned activities. The SCDNR or its mapping subcontractor will submit a Summary Report that describes and provides the results of all automated or manual QA/QC review steps. The report should include the process for all assigned activities.

Independent QC review activities may be performed by the CTP's or FEMA's contractor at the discretion of FEMA. If the CTP will be utilizing its staff or contractor to do the QC review, this should be identified during scoping. The CTP will need to submit its QC plan to the Regional Project Officer for approval. Please note FEMA will also be performing periodic audits and overall study/project management to ensure study quality. The CTP will be responsible for addressing any and all comments resulting from independent QC, including re-submittal of deliverables as needed to pass technical review.

Metadata is required for all activities. Mapping Partners are required to comply with Appendix N (Data Capture Standards, or DCS) and Appendix M (TSDN) of Guidelines and Specifications for Flood Hazard Mapping Partners to completely document the work performed. On July 9, 2008, FEMA provisionally released a revised version of the DCS. FEMA recommends that the new DCS be implemented, in lieu of the current DCS (Appendix N), on any project where it is expected to save time and/or money. The ultimate goal of the new DCS is to consolidate the DCS deliverables and the TSDN to reduce the overlapping requirements for Mapping Partners. Because the newly released revised DCS is not yet complete and the necessary MIP changes have not yet been implemented, in order to ensure that FEMA retains complete documentation of studies, FEMA requires that all FEMA-contracted studies must comply with either the existing or the revised DCS and a complete TSDN be submitted as a final deliverable by the effective date of the project (in addition to uploads to the MIP). Mapping Partners are required to certify their TSDNs by signing the certification of project page to ensure that TSDNs submitted represent the final version of all required documentation or that all MIP uploads represent a complete set of required documentation. The submittal of the TSDN requirement will continue until the revised DCS is finalized.

The MIP shall be updated for status reporting of each of the data development activities within the Manage Data Development task, not less than every thirty days, when the activity is complete, and also include leverage data. The MIP project will be set up when full funding for the DFIRM production of the identified counties in this MAS is available and will include this topographic data collection task. Similarly the Manage Preliminary Map Production and Manage Post Preliminary Processing tasks shall be updated monthly when the producer is performing work on a task in those modules. The "Manage" tasks will be open and accepting updates for up to 90 days after the completion of the last producer task in each module. The MIP shall also be populated with appropriate leverage information regarding who paid for the data provided and the amount of data used by the Flood Map Project.

Topographic Data Development

Responsible Mapping Partner: SCDNR

Scope: SCDNR shall obtain additional topographic data of the overbank areas of the flooding sources in Kershaw, Saluda and Sumter Counties. These data will be for hydrologic analysis, hydraulic analysis, floodplain boundary delineation and/or testing of floodplain boundary standard compliance. New terrain data is needed to update the current effective floodplain that was mapped with outdated USGS DEM in the previous maps updates perpetuating the mapping of invalid studies on outdated terrain in populated areas and area of current and future development. The date of the current terrain is USGS DEMs and the original USGS topographic contour maps dated from 1953 to 1988. The majority of the available USGS DEM data in South Carolina is unusable for floodplain mapping work. To use the USGS topographic data will need to revert to the original topographic maps for contour data to use in floodplain mapping. This data will support approximate floodplain modeling and mapping but will not support detailed and limited detail study modeling and mapping. The accuracy of the USGS 7.5-minute quadrangle topographic map is 90% of all points tested must be within one-half a contour interval. The contour interval for the USGS topographic maps is approximately 10 feet. The terrain data to be acquired is to meet the requirement of a RSME of 15 cm in open terrain and 30 cm RSME overall.

For this activity, SCDNR or its mapping subcontractor also shall generate the data collected under this Topographic Data Development task and via field surveys to create a digital elevation model for the subject flooding sources. In addition, SCDNR or its mapping subcontractor shall address all concerns or questions regarding the topographic data development and processing that are raised by SCDNR or its mapping subcontractor during the independent QA/QC review. SCDNR or its mapping subcontractor should confirm with the FEMA Project Officer the automated appropriate data model(s) (i.e. contours, Digital Elevation Models (DEMs), TIN, mass points and breaklines) for the intended use of the data.

For this activity, SCDNR or its mapping subcontractor also shall develop topographic maps and/or DEMs for the flooding sources in Kershaw, Saluda and Sumter Counties, which are the current effective and potential floodplains in the respective counties, using the data collected under this Topographic Data Development process and via field surveys. In addition, SCDNR or its mapping subcontractor shall address all concerns or questions regarding the topographic data development that are raised by SCDNR or its topographic data development QA/QC subcontractor during the independent QC review, or during the PM 42 defined Validation Process.

LiDAR will be collected for the three counties identified in this scope. If it is shown that it is cost effective to fly the entire county boundaries as opposed to just the stream corridors, then this will be allowed. FEMA funds will only be expended on the processing of the data necessary for floodplain development. Areas outside the flooding boundaries will not be processed unless there is local or state match for that work.

Table 1.1 Summary of Current Topographic Data

County	Description	Source
Kershaw	USGS 7.5-minute quadrangle topographic map with 10 feet contour intervals (1953-1988) and Orthophoto Maps with contour interval of 4 feet (1997)	USGS with an accuracy of one-half a contour interval and NOVA Digital Systems, Inc. (Kershaw County)
Saluda	USGS 7.5-minute quadrangle topographic map with 10 feet contour intervals (1953-1988)	USGS with an accuracy of one-half a contour interval
Sumter	USGS 7.5-minute quadrangle topographic map with 10 feet contour interval (1953-1988)	USGS with an accuracy of one-half a contour interval

Standards: All Topographic Data Development work shall be performed in accordance with the standards specified in Section 5 - Standards.

Deliverables: In accordance with the G&S, SCDNR or its mapping subcontractor shall make the following products available to FEMA by uploading the digital data to the MIP and submitting in Technical Support Data Notebook (TSDN) format so that SCDNR or its QA/QC subcontractor can access it for an independent QA/QC review in accordance with the schedule outlined in Section 6 - Schedule. A metadata file complying with the NFIP Metadata Profiles Specifications, must accompany the uploaded G&S compliant digital data. Additionally, the TSDN format described in the G&S must be delivered in accordance with Section 2 – Technical and Administrative Support Data Submittal.

Where paper documentation is required by State Law for Professional certifications, you may submit the paper in addition to a scanned version of the paper for the digital record.

- Digital contour data;
- Report summarizing methodology and results;
- Mass points and breaklines data;
- Gridded digital elevation model data
- TIN data
- Checkpoint analyses to assess the accuracy of data, including Root Mean Square Error calculations to support vertical accuracy;
- Identification of data voids and methods used to supplement data voids;
- National Geodetic Survey data sheets for Network Control Points used to control remote-sensing and ground surveys;
- Other supporting files consistent with the DCS in the G&S; and

- A Summary Report that describes and provides the results of all automated or manual QA/QC review steps taken during the preparation of the DFIRM as outlined in the approved QA/QC Plan.

Independent QA/QC Review of Topographic Data

Responsible Mapping Partner: SCDNR

Scope: SCDNR or its mapping subcontractor shall perform an impartial review of the mapping data generated by SCDNR or its topographic data development subcontractor under Topographic Data Development to ensure that these data are consistent with FEMA standards and standard engineering practice, and are sufficient to prepare the DFIRM. The CTP and contractor for the CTP, if applicable must ensure that independent QA/QC is performed and that organizational conflict of interest issues do not exist with respect to independent QA/QC processes. FEMA may audit or assist in these activities if deemed to be necessary by the Regional Project Officer.

Please note FEMA will also be performing periodic audits and overall study/project management to ensure study quality. The CTP will be responsible for addressing any and all comments resulting from independent QC, including re-submittal of deliverables as needed to pass technical review.

Standards: All Topographic Data Development work shall be reviewed in accordance with the standards specified in Section 5 - Standards.

Deliverables: In accordance with the G&S, SCDNR or its mapping subcontractor shall make the following products available to FEMA by uploading the digital data to the MIP. Additionally, the TSDN format described in the G&S must be delivered in accordance with Section 2 – Technical and Administrative Support Data Submittal.

This submittal will occur in accordance with the schedule outlined in Section 6 - Schedule.

- A Summary Report that describes the findings of the independent QA/QC review; and
- Recommendations to resolve any problems that are identified during the independent QA/QC review.
- Completed, organized, and archived case files and flood elevation dockets.

SECTION 2—TECHNICAL AND ADMINISTRATIVE SUPPORT DATA SUBMITTAL

The Project Team members for this Flood Map Project that have responsibilities for activities included in this MAS shall comply with the data submittal requirements summarized below.

All supporting documentation for the activities in this MAS/SOW shall be submitted in the TSDN format in accordance with the FEMA G&S. Table 2.1 Mapping Activities and Applicable TSDN Sections indicates the sections of the TSDN that apply to each mapping activity.

If any issues arise that could affect the completion of an activity within the proposed scope or budget, the responsible Mapping Partner shall complete a Special Problem Report (SPR) as soon as possible after the issue is identified and submitted to FEMA. The SPR is to describe the issue and propose possible resolutions. (For additional information on SPRs, refer to the G&S.)

Table 2.1- Mapping Activities and Applicable TSDN Sections

TSDN Section	Mapping Activities													
	Scoping	Field Survey	Topo Data	QA/QC of Topo	Base Map	Hydrology Coastal	QA/QC of Hydrology Coastal	Hydraulic Analysis	QA/QC of Hydraulics	Floodplain Mapping (and re-delineation)	QA/QC of FP Mapping	DFIRM Database	Preliminary Map Products	Post Preliminary
General Documentation														
Special Problem Reports	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Telephone Conversation Reports	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Meeting Minutes/ Reports	X	X	X	X	X	X	X	X	X	X	X	X	X	X
General Correspondence	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Engineering Analyses														
Hydrologic Analyses		X			X	X	X	X	X	X	X			
Hydraulic Analyses		X			X	X	X	X	X	X	X			
Key to Cross-Section Labeling		X			X	X	X	X	X	X	X			
Key to Transect Labeling		X			X	X	X	X	X	X	X			
Draft FIS Report					X	X	X	X	X					
Mapping Information	X		X	X	X					X	X	X	X	X
Miscellaneous Reference Information	X	X	X	X	X	X	X	X	X	X	X	X	X	X

SECTION 3—PERIOD OF PERFORMANCE

The mapping activities outlined in this MAS will be completed as specified in the Agreement Articles of the Cooperative Agreement. The Mapping Activities may be terminated at the option of FEMA or SCDNR in accordance with the provisions of the Partnership Agreement dated September 20, 1999. If these mapping activities are terminated, all products produced to date must be returned and updated into the MIP and the remaining funds from uncompleted activities, provided by FEMA for this MAS, will be returned to FEMA.

SECTION 4—FUNDING/LEVERAGE

Based on the availability of the funds in the Regional account, FEMA is providing funding, in the amount of _____ to SCDNR for the completion of this Flood Map Project. SCDNR shall provide any additional resources required to complete the assigned activities for this Flood Map Project. During the scoping process, additional needs may be identified. Activities associated with any additional needs would be performed based on availability of additional funds. The leverage listed below includes in-kind services and blue book values for acquired information (i.e. base map data, hydrologic and hydraulic analyses, etc.). These values should also be reported in the MIP by the appropriate task owner. The current Blue Book is dated January 2009 and can be downloaded from FEMA's Information Resource Library at <http://www.fema.gov/library/index.jsp>. SCDNR shall complete Table 4.1 Contribution and Leverage

Table 4.1 Contribution and Leverage

Project Task	FEMA Contribution	Partner Contribution	% Partner Leverage	Total Project Cost
Topographic Data Development for Kershaw, Saluda and Sumter Counties				
TOTAL FUNDING AMOUNTS				

Leverage dollars or units shall be entered as applicable within the Manage Data Development task in the MIP workflow.

SECTION 5—STANDARDS

The standards relevant to this MAS are provided in Tables 5-1 Applicable Standards for Project Activities and 5-2 Project Activities and Applicable Portions of FEMA Guidelines and Specifications. Information on the correct volume and appendix of the G&S to be referenced for each mapping activity are summarized in Table 5-2 for convenience. However, all mapping partners working on a Flood Map Project are responsible for complying with all appropriate requirements in FEMA's G&S including the Final Draft Guidelines for Coastal Flood Hazard Analysis and Mapping for the Pacific Coast of the United States and Atlantic Ocean and Gulf of Mexico Coastal Guidelines Update Final Draft, collectively referred to as "Coastal Guidelines Updates"; and related PMs published by FEMA as of the date of this agreement.

These guidelines may be downloaded from the FEMA Flood Hazard Mapping website at http://www.fema.gov/plan/prevent/fhm/dl_cgs.shtm. The Geospatial Data Coordination Policy and the Geospatial Data Coordination Implementation Guide are located at <https://hazards.fema.gov> under "Tools & Links."

Table 5-1. Applicable Standards for Project Activities

Applicable Standards	Topo Data	QA/QC Topo Data
	<i>Guidelines and Specifications for Flood Hazard Mapping Partners and Procedure Memorandums</i>	X
FEMA's Geospatial Data Coordination Policy	X	
FEMA's Geospatial Data Coordination Implementation Guide	X	
Engineer Manual 1110-2-1003, <i>Hydrographic Surveys</i> (USACE), January 1, 2002		

Applicable Standards	Topo Data	QA/QC Topo Data
	"Numerical Models Accepted by FEMA for NFIP Usage," Updated April 2003 NFIP Metadata Profile Specifications <i>Document Control Procedures Manual</i> <i>44 Code of Federal Regulations Parts 65, 66 and 67</i>	X

Table 5-2. Project Activities and Applicable Portions of FEMA Guidelines and Specifications

Activity Description	Applicable Volume, Section/Subsection, and Appendix
Field Survey	Volume 1 Appendices A, B, C, F, and M
Topographic Data Development and Independent QA/QC Review of Topographic Data	Volume 1, Appendices A and M

SECTION 6— SCHEDULE

The activities documented in this MAS shall be completed in accordance with Table 6.1 Mapping Activities Schedule. If changes to this schedule are required, the responsible Mapping Partner shall coordinate with FEMA and the other Mapping Partners in a timely manner. Please also identify to whom the products associated with each task are to be submitted to (i.e. the MIP, FEMA Regional Office, etc.).

Table 6.1 Mapping Activities Schedule

ACTIVITIES	RESPONSIBLE PARTNER(S)	START DATE	END DATE	COST
Topographic Data Development	SCDNR	NTP	270 days after NTP	
Independent QA/QC Review of Topographic Data	SCDNR	210 days after NTP	270 days after NTP	\$
TOTAL COST				

SCDNR shall provide to the MIP workflow tasks with schedule and cost information within 45 days once funds are awarded.

SECTION 7—CERTIFICATIONS

Data Capture Standards

- DCS Certification Form** FEMA-funded data development tasks must be certified using the DCS Certification form provided in revised version of Appendix M. A PDF of the form with the signature, data, and seal affixed to the form must be submitted digitally. This form must be signed by a registered Professional Engineer (or Surveyor if appropriate) from the firm contracted to perform the work, or by the responsible official of a government agency. A digital version of this form is available at www.fema.gov.
- Field Surveys and Topographic Data Development**
 A Registered Professional Engineer or Licensed Land Surveyor shall provide an accuracy statement for field surveys and/or topographic data used and shall certify these data meet the accuracy statement provided. Data accuracy should be stated used the Federal Geographic Data Committee National Standards for Spatial Data Accuracy, but the American Society for Photogrammetry and Remote Sensing accuracy reporting standards are acceptable.

SECTION 8—TECHNICAL ASSISTANCE AND RESOURCES

Project Team members may obtain copies of FEMA-issued LOMCs, archived engineering backup data, and data collected as part of the Mapping Needs Assessment Process from FEMA and/or your Regional Project Officer.

General technical and programmatic information, such as FEMA 265 and the Quick-2 computer program, can be downloaded from the FEMA website at http://www.fema.gov/plan/prevent/fhm/frm_soft.shtm. Specific technical and programmatic support may be provided through FEMA and/or its contractor; such assistance should be requested through the FEMA Project Officer specified in Section 12 – Points of Contact.

Project Team members also may consult with the FEMA Regional Project Officer to request support in the areas of selection of data sources, digital data accuracy standards, assessment of vertical data accuracy, data collection methods or subcontractors, and GIS-based engineering and modeling training.

Assistance with the MIP may be requested at miphelp@mapmodteam.com.

SECTION 9—CONTRACTORS (CTP)

SCDNR intends to use the services of AECOM Water, URS Corporation and United States Geological Survey (USGS) as a contractor for this Flood Map Project. SCDNR shall ensure that the procurement for all contractors used for this Flood Map Project complies with the requirements of 44 CFR 13.36.

Part 13 may be downloaded in PDF or text format from the United States Government Printing Office website at http://www.access.gpo.gov/nara/cfr/waisidx_04/44cfr13_04.html.

SECTION 10—REPORTING

Financial Reporting: Because funding has been provided to SCDNR by FEMA, financial reporting requirements for SCDNR will be in accordance with Cooperative Agreement Articles. SCDNR shall also refer to 44 CFR 13.41.

SCDNR shall provide financial reports to the FEMA Regional Project Officer and Assistance Officer in accordance with the terms of the signed Cooperative Agreement for this MAS.

Status Reporting: Status reports will be submitted on a quarterly basis in accordance with the financial reporting submittals. SCDNR shall refer to 44 CFR 13.4 to obtain minimum requirements for status reporting. The Project Officer, as needed, may request additional information on status.

SCDNR may meet with FEMA and/or its contractor up to bi-weekly, or more frequently if needed, to review the progress of the project in addition to the quarterly financial and status submittals. These meetings will alternate between FEMA's Regional Office, the SCDNR office, and conference calls, as necessary.

Earned Value Reporting: The MIP Workflow is designed to track the Earned Value of mapping projects. This information is automatically calculated by the MIP, using the Actual cost and schedule of work performed, or “actuals” and comparing them to the expected cost and schedule of work performed, or “baseline”.

Once the FEMA Regional office has funded a project FEMA will complete the “Obligate Project Funds” screen in the MIP. This step establishes the baseline for the project in the MIP, using the cost and schedule information for each task as outlined in this document and agreed to at the completion of the scoping process.

The MIP study workflow allows SCDNR to report on the status of these projects at a task level. The cost and schedule information, updated by the SCDNR for each contracted task, is compared to the baseline established for those tasks. This information is rolled up to a project level and monitored by the FEMA Region to assess progress and Earned Value.

Earned Value reporting involves the reporting of cost, schedule and performance (physical percent complete) in the MIP by SCDNR.

Once the baseline has been established in the MIP, the SCDNR shall input the performance and actual cost to date for each contracted task for each project. This must be completed at minimum every thirty days and at the completion of the task. When a task is completed, including all QA/QC activities in this MAS plus the Quality Control Reviews established in PM 42. The SCDNR shall enter 100% complete, enter the actual completion cost, and the actual completion date within the Manage Data Development, Manage Preliminary Map Production, or Manage Post Preliminary Processing, as applicable.

The Project Officer, as needed, may request additional information on status on an ad hoc basis.

Section 11—PROJECT COORDINATION

Throughout the project, all members of the Project Team will coordinate, as necessary, to ensure the products meet the technical and format specifications required and contain accurate, up-to-date information. Coordination activities shall include:

- Meetings, teleconferences, and video conferences with FEMA and other Project Team members monthly;
- Telephone conversations with FEMA and other Project Team members on a scheduled basis monthly and an ad hoc basis, as required;
- Updates to the MIP and other FEMA status information systems in accordance with requirements in Volumes 1 and 3 of G&S; and
- E-mail, facsimile transmissions, and letters, as required.

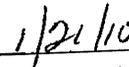
SECTION 12—POINTS OF CONTACT (CTP)

The points of contact for this Flood Map Project are Laura Algeo, the FEMA Regional Project Officer; Lisa Jones, the Project Manager for SCDNR; or subsequent personnel of comparable experience who are appointed to fulfill these responsibilities. When necessary, any additional FEMA assistance should be requested through the FEMA Regional Project Officer.

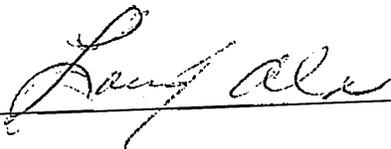
Each party has caused this MAS to be executed by its duly authorized representative.



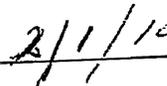
Lisa Jones
Director, Flood Mitigation Program
South Carolina Department of Natural Resources



Date



Laura Algeo
Regional Project Officer
Federal Emergency Management Agency, Region IV



Date

