Meta-Analysis: Remote Sensing Job Tasks
From 3 DACUM Job Analyses for Remote Sensing Specialists
March, 2012

Category	Task Group	Actual Tasks	Duty Category	DACUM Panel**
MANAGE DATA				
	Order data			
		Order data *	Acquire Data	MIL
		Order data (parameters: capture, task, archival, ancillary) *	E Acquire Data	DEN
		Contract image acquisition with remote sensing data providers	Acquire Data	SAC
	Upload/download data			
		Upload files *	Disseminate Results	MIL
		Ingest data *	Produce Data	DEN
		Download data *	Acquire Data	MIL
		Download / decompress files	Acquire Data	SAC
		Download data *	Acquire Data	MIL
		Import data	Manage Data	MIL
		Import image / data	Prepare Data	SAC
	Backup & restore data			
		Create backup (fail-over) *	Manage Data	DEN
		Archive data *	Manage Data	DEN
		Backup / Restore data to / from local archive *	Manage Data	MIL
		Backup / restore data to / from off-site archive	Manage Systems	MIL
	Create & edit metadata			
		Create metadata structure	Manage Data	MIL
		Compile metadata	Develop End Products	SAC
		Populate metadata *	Generate Products	DEN
	Create templates			
		Create templates (databases, data attributes, work flow)	Develop Project Plan	DEN
	Create data storage structure			
		Create data / file structure	Acquire Data	SAC
		Create geospatial database(s)	Manage Data	DEN
		Setup file structure	Manage Data	DEN
		Create data storage structure (geodatabase, working directory, top	Manage Data	MIL
		Setup project environment	Produce Data	DEN
	Maintain/Organize data			
		Maintain geospatial database(s) *	Manage Data	DEN
		Maintain image library *	Manage Data	DEN
		Organize data (rename, index volumes) *	Manage Data	MIL
		Organize & archive validation data	Validate & Ground – Truth Data	SAC
		Resolve data issues	Acquire Data	MIL
	Convert/reformat data			
		Convert data format (raster/vector) *	Manage Data	MIL
		Convert rasters to vectors	Prepare Data	SAC
		Convert vectors to rasters	Prepare Data	SAC
		Output LAS (Lidar) files	Process Data	MIL
		Convert waveform data to points (LIDAR)	Process Data	MIL
		Reformat image / data type	Prepare Data	SAC
		Format data (compression, interleave) *	Produce Data	DEN
		Reformat data *	Manage Data	MIL
		Export data (multiple formats)	Develop End Products	SAC
		Migrate data to new environment	Manage Data	DEN
	Scan Data			
		Scan data *	Acquire Data	MIL
	Assign data access			
		Assign access permissions	Manage Data	MIL
		Stage data access	Manage Data	MIL
		Administer security protocols	Manage hardware and software	DEN

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	Generate scripts & queries			
		Develop batch processing scripts	Extract Information	SAC
		Implement scripts (write, customize)	Process Data	MIL
		Create and run definition queries	Generate Products	DEN
		Automate production (scripting, models, programming)	Generate Products	DEN
	Research data sources			
		Conduct background research	Project Planning	MIL
		Identify data sources (needed & available)	Project Planning	MIL
		Research data sources *	Develop Project Plan	DEN
	Inventory available data			
		Inventory available imagery using web resources	Manage Projects	SAC
		Inventory local knowledge of study area	Validate & Ground – Truth Data	SAC
		Query hardcopy resources (archives) *	Acquire Data	MIL
		Query on-line resources (archives, private…) *	Acquire Data	MIL
		Search web-based image providers	Acquire Data	SAC
	Select appropriate data			
		Select appropriate data	Acquire Data	SAC
		Select appropriate data type based on platform/resolution (spectra	Manage Projects	SAC
		Select appropriate output format	Acquire Data	SAC
		Select data type(s) based on scope of work	Acquire Data	MIL
	Assess data quality			
		Perform quality control on data acquired	E Acquire Data	DEN
		Perform image quality assessment	Assure Quality	DEN
CREATE AND EDIT DATA				
	Create & edit vector data			
		Perform vector editing /clean up (build topology) *	Generate Products	DEN
		Generalize vector data (smooth) *	Process Data	MIL
		Perform heads-up digitizing	Extract Information	SAC
		Digitize / vectorize data *	Process Data	MIL
	Create maps			
		Create Site Maps *	Acquire Data	MIL
		Design maps	Develop End Products	SAC
		Create cartographic maps *	Disseminate Results	MIL
		Create site suitability maps	Analyze Data	MIL
	Create animations & fly-throughs			
		Create animations	Develop End Products	SAC
		Create video fly through	Analyze Data	MIL
		Create 3D / stereo images *	Integrate Data	MIL
		Create fly-throughs	Generate Products	DEN
MANAGE PROJECTS				
	Write proposals			
		Write proposals	Manage Programs	DEN
		Write funding proposals	Manage Projects	SAC
		Write proposals & grant applic. to secure funding	Project Planning	MIL
	Prepare project plan			
		Prepare quality plan	Project Planning	MIL
		Devise contingency plan (data, resources,gaps)	Project Planning	MIL
	Prepare budget			
		Prepare budget	Project Planning	MIL
		Develop project budget (resources, $, time, people)	Develop Project Plan	DEN
		Create project budget (staffing, cost factor, timeline, site visit)	Manage Projects	SAC

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	Clarify project scope & objectives			
		Clarify project scope / objectives with client	Manage Projects	SAC
		Document project scope / objectives	Manage Projects	SAC
		Identify project deliverables	Project Planning	MIL
		Define area & time period of interest	Manage Projects	SAC
		Determine area of interest	Develop Project Plan	DEN
		Identify study area	Project Planning	MIL
		Determine data specifications (goals, collection requirements & par	Develop Project Plan	DEN
		Evaluate data request feasibility	Develop Project Plan	DEN
		Prepare project scope & methodology	Project Planning	MIL
	Define project methodology & timeline			
		Define methodology & workflow (classification scheme)	Manage Projects	SAC
		Document procedures	Manage Programs	DEN
		Prepare schedule / timeline	Project Planning	MIL
		Track project milestones (funding, costs)	Manage Projects	MIL
	Allocate project resources			
		Identify needed resources (software, servers, personnel, equipmen	Project Planning	MIL
		Coordinate project resources (staff, software, hardware)	Manage Projects	MIL
		Coordinate with IT and R&D personnel (internal & external)	Manage Systems	MIL
		Allocate resources (time/people /$)	Manage Programs	DEN
	Evaluate project personnel			
		Select project personnel	Manage Projects	MIL
		Assign tasks to personnel	Manage Projects	MIL
		Participate in review panels (on-line & in-person)	Pursue Professional Development & Outreach	SAC
		Contribute to the hiring procedures	Manage Programs	DEN
		Evaluate employees	Manage Programs	DEN
		Evaluate staff performance (safety, interns)	Manage Projects	MIL
	Monitor project status			
		Monitor project status	Develop Project Plan	DEN
		Monitor project environment (troubleshoot, versioning)	Produce Data	DEN
		Monitor schedule and budget	Manage Projects	SAC
		Evaluate environmental conditions	Manage Projects	SAC
		Evaluate project	Develop Project Plan	DEN
		Verify project completeness	Assure Quality	DEN
	Streamline workflow			
		Streamline workflow (Increase efficiency)	Develop Project Plan	DEN
		Troubleshoot problems	Manage Projects	MIL
		Identify & implement process improvements	Manage Projects	MIL
	Communicate with client(s)			
		Coordinate with client	Project Planning	MIL
		Interact with client	Manage Programs	DEN
		Conduct kick- off meeting /orientation	Manage Projects	MIL
		Conduct project meetings	Manage Projects	MIL
		Verify customer satisfaction (client meetings)	Assure Quality	DEN
	Contribute to company's strategic plan			
		Contribute to company's strategic plan	Manage Programs	DEN

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IMAGE PROCESSING					
	Image classification				
		Determine classification scheme	Extract Information	SAC	+
		Evaluate & modify spectral signatures based on separability for clas	Extract Information	SAC	*
		Define spectral signatures for classification	Extract Information	SAC	*
		Convert unsupervised classes for spectral signatures for hybrid clas	Extract Information	SAC	+
		Create raster training sets	Analyze Data	MIL	*
		Classify data	Analyze Data	MIL	*
		Conduct decision tree classification	Extract Information	SAC	+
		Conduct sub-pixel classification (spectral mixture analysis)	Extract Information	SAC	+
		Perform neural network classification	Extract Information	SAC	+
		Perform supervised classification (single or multi-date image)	Extract Information	SAC	*
		Perform unsupervised classification (single or multi-date image)	Extract Information	SAC	*
		Assess classification accuracy	Assure Quality	DEN	+
		Evaluate classification accuracy (user, producers, overall / kappa)	Assess Accuracy	SAC	*
		Assess attribution accuracy *	Assure Quality	DEN	*
		Compare classification accuracy with standards	Assess Accuracy	SAC	*
		Compare validation data with classification	Assess Accuracy	SAC	*
		Create confusion matrix (contingency table)	Assess Accuracy	SAC	*
		Refine classification (change inputs, iterate)	Extract Information	SAC	*
		Reduce noise in classification	Develop End Products	SAC	*
		Recode / reclassify image	Develop End Products	SAC	*
	Image management (Subset, clip, crop, mask)				
		Assemble spatial extent (mosaic, subset, tiling, mask)	Produce Data	DEN	*
		Extract areas of interest (clip, subset, crop) *	Process Data	MIL	*
		Subset image / data	Prepare Data	SAC	*
		Mask unnecessary features	Prepare Data	SAC	*
	Mosaic/coregister images				
		Mosaic image / data	Prepare Data	SAC	*
		Create mosaics *	Process Data	MIL	*
		Conduct seam line generation and editing for mosaicking *	Produce Data	DEN	*
		Co-register data (vertical registration) *	Produce Data	DEN	*
	Sample/Resample image data			0	
		Resample image / data	Prepare Data	SAC	*
		Resample image data *	Process Data	MIL	*
		Conduct data sampling	Analyze Data	MIL	*
	Radiometric claibration				
		Perform atmospheric correction	Prepare Data	SAC	*
		Perform radiometric correction	Prepare Data	SAC	*
		Correct image defects	Prepare Data	SAC	*
		Calibrate date (radiometric & geometric, atmospheric correction)	Produce Data	DEN	*
	Image Enhancement				
		Perform image enhancement (pan sharpening, tonal balance, atmo	Process Data	MIL	*
		Identify appropriate band combinations for display	Prepare Data	SAC	*
		Enhance image contrast	Prepare Data	SAC	*
		Enhance image for visual interpretation	Produce Data	DEN	*
		Filter image (edge enhancement, smoothing)	Extract Information	SAC	*
	Visual interpretation				
		Conduct visual interpretation	Extract Information	SAC	
		Conduct visual interpretation	Generate Products	DEN	
	Georeference data				
		Georeference image / data	Prepare Data	SAC	*
		Georeference data (GNSS, INS) *	Produce Data	DEN	*
	Reproject\transform data				
		Perform projection/datum transformation	Prepare Data	SAC	*
		Reproject & transform data *	Process Data	MIL	*
		Transform images (PCA, vegetation indices, band ratios)	Extract Information	SAC	

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ANALYZE DATA					
	Proximity analysis				
		Perform proximity analysis	Analyze Data	MIL	*
	Quantative analysis				
		Conduct quantitative analysis on active sensor data	Generate Products	DEN	
		Conduct quantitative analysis on passive sensor data	Generate Products	DEN	
		Quantify features	Analyze Data	MIL	
		Quantify results (class statistics, landscape metrics)	Develop End Products	SAC	
		Tabulate area attributes *	Integrate Data	MIL	*
		Summarize values in a grid (aggregate) *	Integrate Data	MIL	*
	Change detection				
		Perform time series analysis	Extract Information	SAC	+
		Perform change detection	Generate Products	DEN	*
		Conduct change detection *	Analyze Data	MIL	*
		Create a difference image (math tools)	Process Data	MIL	
	Statistical analysis				
		Conduct trend analysis	Analyze Data	MIL	
		Perform regression analysis	Assess Accuracy	SAC	+
		Perform geostatistical analysis	Generate Products	DEN	+
	Feature extration\image segmentation				
		Perform vector (feature) extraction *	Generate Products	DEN	*
		Extract features *	Analyze Data	MIL	*
		Perform object-based image analysis	Extract Information	SAC	
		Perform image segmentation	Extract Information	SAC	+
		Conduct image subtraction (single bands or image transforms)	Extract Information	SAC	*
		Create ratio images (NDWI, NDVI, MSI, LAI, EVI, snow, tassel cap tra	Analyze Data	MIL	+
	Conduct resource and scenario analysis				
		Conduct cultural resource analysis	Analyze Data	MIL	+
		Conduct wetlands analysis	Analyze Data	MIL	+
		Conduct line of sight analysis *	Analyze Data	MIL	*
		Conduct emergency response analysis	Analyze Data	MIL	+
		Conduct fracture trace & lithology analysis	Analyze Data	MIL	+
		Perform mensuration *	Generate Products	DEN	*
	Quality Assurance & Quality Control				
		Design validation sampling plan / methods	Validate & Ground – Truth Data	SAC	+
		Conduct accuracy assessment	Analyze Data	MIL	*
		Assess absolute accuracy and precision	Assure Quality	DEN	*
		Assess positional accuracy (RMS)	Prepare Data	SAC	*
		Assess relative accuracy and precision	Assure Quality	DEN	*
		Verify results of analysis using ground truth	Analyze Data	MIL	+
		Compare image geometry with ground control to assure spatial acc	Assess Accuracy	SAC	*
		Validate analysis results	Analyze Data	MIL	*
		Enforce topology	Assure Quality	DEN	*
		Perform error trapping (systematic errors)	Assure Quality	DEN	*
	Model Surfaces				
		Model land surface characteristics	Analyze Data	MIL	+
		Develop a predictive planning model (urban sustainability model)	Analyze Data	MIL	+
		Perform 3D modeling	Generate Products	DEN	*
		Create surface models (TINs, DSMs, DTMs)	Generate Products	DEN	*
	Integrate data				
		Build mashups	Generate Products	DEN	*
		Display maps and data on raster dataset *	Integrate Data	MIL	*
		Combine image /data layers	Prepare Data	SAC	*
		Integrate non-spatial data *	Generate Products	DEN	*
		Link / hyperlink data *	Integrate Data	MIL	*

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PHOTOGRAMMETRY					
	Create photogrammetric data				
		Perform stereo compilation*	Generate Products	DEN	*
		Derive topographic products	Generate Products	DEN	*
		Edit DEMs	Produce Data	DEN	*
	Orthorectify data				
		Peform ortho-rectification *	Produce Data	DEN	*
		Orthorectify /rectify data (raster, vector, geocorrect)	Process Data	MIL	*
		Ortho-rectify image / data	Prepare Data	SAC	*
	Plan Field Mission: Photgrammetric Data				
		Establish horizontal and vertical control (AGPS, INS, GCPs, tie points)	E Acquire Data	DEN	*
		Obtain clearances (flight, ground permissions, customs)	Acquire Data	MIL	+
LIDAR					
	Create LIDAR based products				
		Perform point cloud classification (automated macro filtering) *	Produce Data	DEN	*
		Remove noise from raster / LIDAR data (spikes, bands, speckles) *	Process Data	MIL	*
		Create intensity image (LiDAR)	Produce Data	DEN	*
COLLECT FIELD DATA					
	Plan field missions				
		Develop field logistics (people, equipment, permissions)	Validate & Ground – Truth Data	SAC	*
		Adjust GNSS ground control network	Process Data	MIL	*
		Verify sensor calibration	Analyze Data	MIL	+
		Configure field equipment (GPS, magnetometer, sensor installation)	Manage Systems	MIL	*
		Calibrate Sensors	Manage Systems	MIL	+
		Create airborne trajectory	Process Data	MIL	*
		Create coverage index *	Acquire Data	MIL	*
		Establish control networks	Acquire Data	MIL	+
		Create sampling strategy	Project Planning	MIL	+
	Collect ground control points				
		Collect ground control points for imagery registration	Validate & Ground – Truth Data	SAC	
		Conduct field campaigns *	Acquire Data	MIL	
		Conduct Flight surveys	Acquire Data	MIL	+
		Collect ground reference data *	E Acquire Data	DEN	
		Conduct ground truthing *	Acquire Data	MIL	
		Conduct rapid in-situ reconnaissance	Validate & Ground – Truth Data	SAC	
		Collect spectral signatures for imagery classification.	Validate & Ground – Truth Data	SAC	
		Collect training & accuracy data (field or sensor based)	Validate & Ground – Truth Data	SAC	
MAINTAIN HARDWARE AND SOFTWARE					
	Maintain hardware				
		Maintain field hardware (GNSS, sensors, planes)	Manage hardware and software	DEN	
		Maintain computer hardware	Manage hardware and software	DEN	
	Maintain software & services				
		Maintain software (licensing, install, update)	Manage hardware and software	DEN	
		Install/update software (configure license server, field equipment)	Manage Systems	MIL	
		Decommission services (website, links, hardware, files)	Manage hardware and software	DEN	
		Allocate server space	Manage Systems	MIL	

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SOFT SKILLS				
	Write reports			
		Create scientific reports	Develop End Products	SAC
		Prepare progress reports	Manage Projects	MIL
		Prepare written reports/ documentation	Disseminate Results	MIL
	Create charts			
		Create charts	Develop End Products	SAC
	Create tables			
		Create tables	Develop End Products	SAC
	Prepare exhibits			
		Prepare exhibits (graphics, tables, charts, imagery, annotation)	Disseminate Results	MIL
	Prepare & give presentations			
		Develop presentation graphics (graphs, power point) *	Generate Products	DEN
		Give presentations at professional events (community colleges)	Professional Development	MIL
		Conduct presentations	Pursue Professional Development & Outreach	SAC
		Prepare presentations	Develop End Products	SAC
		Perform public speaking *	Develop Professionally	DEN
		Present findings face to face	Disseminate Results	MIL
	Compile deliverables			
		Respond to data requests *	Manage Data	DEN
		Prepare deliverables (compile) *	Disseminate Products	DEN
		Deliver Media (hard drive, DVD) *	Disseminate Products	DEN
		Inform client of delivery	Disseminate Products	DEN
	Post/Publish/Print digital data			
		Share data (web-FTP)	Develop End Products	SAC
		Ensure adequate security for product dissemination	Disseminate Products	DEN
		Post deliverables to website or map service (wiki, cloud) *	Disseminate Products	DEN
		Post deliverables to FTP and server *	Disseminate Products	DEN
		Publish metadata *	Disseminate Results	MIL
		Print large format maps	Develop End Products	SAC
		Publish final papers	Disseminate Results	MIL
		Publish journal articles	Pursue Professional Development & Outreach	SAC
		Present findings virtually	Disseminate Results	MIL
DEVELOP PROFESSIONALLY				
	Acquire professional certification			
		Acquire professional certification	Professional Development	MIL
		Pursue professional certification *	Develop Professionally	DEN
		Acquire professional certifications	Pursue Professional Development & Outreach	SAC
	Pursue advance degrees & certificates			
		Pursue advance degrees / certificates *	Professional Development	MIL
		Pursue advanced degree *	Develop Professionally	DEN
		Pursue advanced degrees	Pursue Professional Development & Outreach	SAC
	Attend training & workshops			
		Attend on-line courses (podcast / webinars)	Pursue Professional Development & Outreach	SAC
		Attend training (classroom, on-line, on-the-job, job shadow) *	Develop Professionally	DEN
		Attend training *	Professional Development	MIL
		Develop personal skills & qualifications *	Professional Development	MIL
	Participate in conferences, seminars and workshops			
		Participate in workshops	Pursue Professional Development & Outreach	SAC
		Attend professional events *	Professional Development	MIL
		Participate in conferences, seminars and workshops *	Develop Professionally	DEN
		Participate in conferences	Pursue Professional Development & Outreach	SAC
	Read professional literature			
		Read technical articles	Pursue Professional Development & Outreach	SAC
		Research fields of application	Pursue Professional Development & Outreach	SAC
		Read professional literature	Professional Development	MIL
		Research technology *	Develop Project Plan	DEN

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	Prepare & conduct training			
		Produce training materials	Pursue Professional Development & Outreach	SAC
		Conduct training (external/ internal)	Professional Development	MIL
		Train client on product	Disseminate Products	DEN
		Conduct training (job shadow) *	Develop Professionally	DEN
	Contribute to publications			
		Contribute to publications *	Develop Professionally	DEN
	Mentor others			
		Participate in mentoring program *	Develop Professionally	DEN
		Mentor others	Pursue Professional Development & Outreach	SAC
	Network professionally			
		Interact with co-workers *	Manage Programs	DEN
		Network with other Professionals *	Develop Professionally	DEN
	Participate in professional outreach			
		Provide professional outreach *	Develop Professionally	DEN
		Conduct community outreach	Pursue Professional Development & Outreach	SAC
		Conduct workshops	Pursue Professional Development & Outreach	SAC
		Produce outreach materials (brochures etc.)	Pursue Professional Development & Outreach	SAC
	Inventory personal skills			
		Inventory personnel skills	Manage Projects	MIL

*Entry-level task, + Advanced-level task

**Panels: DEN = Denver 2011, SAC = San Jose 2009, MIL = Milwaukee 2011

By: John Johnson, National GeoTech Center, 2012