

Duties		Tasks													
A	Plan Projects (E)	A1 Clarify audience/ scope of work	A2 Prepare project feasibility studies	A3 Coordinate resources (budget, time, people)		A4 Develop & create data structure (naming, conventions)		A5 Create spatial database (SQL, Geodatabase)		A6 Define data attributes	A7 Evaluate project progress				
B	Acquire Data (E)	B1 Coordinate acquisition logistics (permissions, legal, GPS mission planning)		B2 Obtain outside data (legal docs)	B3 Connect to real time data sources	B4 Upload project parameters	B5 Create data dictionary	B6 Assemble fieldwork equipment	B7 Calibrate control network	B8 Collect GPS observations	B9 Record field notes (photo, site surveys, inspections, samples)		B10 Scan documents	B11 Export raw data	
C	Process Data (E)	C1 Validate data integrity (sampling, projections)	C2 Post process data (LIDAR field notes, GPS, Imagery)		C3 Convert datums and projections	C4 Georeference information (PDF, video, images)		C5 Digitize data	C6 COGO data	C7 Geocode data	C8 Populate data attributes	C9 Create map layer	C10 Create metadata	C11 Create base map	C12 Create raster mosaic
C	Process Data con't		C13 Create cache	C14 Backup & archive data											
D	Analyze Data (A/E)	D1 Edit/update data attributes (data attribute tables)		D2 Edit/update geometry	D3 Join data (SQL)	D4 Relate Data	D5 Build network data set	D6 Build models (model builder, add-ins automate)		D7 Execute models	D8 Write programming scripts (python automate, C#)		D9 Execute programming scripts	D10 Create query statements (SQL, joins, relates)	
D	Analyze Data con't		D11 Conduct surface analysis (slope, contour, TINs)		D12 Conduct cost analysis	D13 Conduct network analysis	D14 Conduct raster analysis	D15 Conduct statistical analysis	D16 Conduct spatial analysis						
E	Administer Server (A)	E1 Configure servers	E2 Configure user permissions	E3 Develop GIS website	E4 Publish web services	E5 Maintain GIS website	E6 Troubleshoot server	E7 Update server							
F	Produce Deliverables (E)	F1 Export final data (DTMs, raster vector, tables, CAD, elevation data)		F2 Create static maps (PDF, paper, e.g. density map)		F3 Create dynamic maps (e.g. web-map)	F4 Create map books	F5 Compose reports (statistical, charts, graphs)		F6 Write proposals (grants)	F7 Create web services (WMS, WFS, ARC server)	F8 Create navigational maps (GPS tours)	F9 Create progress reports	F10 Create presentations	F11 Deliver presentations
G	Support Users (A)	G1 Create Help Files (answer FAQs)	G2 Develop instructional materials	G3 Conduct training (meetings, job shadow)	G4 Provide technical support (troubleshoot)	G5 Solicit user feedback	G6 Closeout project								
H	Professional Development (A/E)	H1 Attend employer mandated training	H2 Obtain certifications and licensure	H3 Maintain credentials	H4 Attend webinars and on-line classes	H5 Attend conferences and seminars	H6 Present at conferences and seminars	H7 Subscribe to trade publications	H8 Participate in user groups and committees	H9 Expand professional network	H10 Participate in on-the-job training (job shadow)		H11 Explore new technologies	H12 Obtain advanced degrees	H13 Promote GIS

(E: entry level tasks, A: Advanced level tasks)

General Knowledge, Skills & Worker Behaviors

Adaptability	Leadership
Analytical	Legal document interpretation
C#	Logical
C++	Math
Cartography	Mentoring
Color bands	Navigational skills
Common sense	Optimistic
Comprehension	Oral communication (oral, listening, body language)
Compromising	Organizational skills
Computer	Pass background check
Conflict resolution	Patience
Coordinate Systems	People skills
Database	Personal Communication Systems (PCSS)
Decision making	Positive demeanor
Dependability	Presentation
Detail oriented	Problem Solving
Equipment maintenance	Programming skills
Flexibility	Public Relations
Follow instructions	Python
Geotagging	Query statements
GIS	Resourceful
Grant writing	Saver
Honesty	Scripting
Initiative	SQL
Integrity	
Language	

Tools, Equipment, Supplies and Materials

3D BIM - Model builder	Mapwel
3D City Models	Microsoft Office
Adobe Photoshop	Mobile Devices
Adobe Professional	Model Builder (ESRI)
Auto-Cad	Opus-Online
Camera (GPS)	Oruxmaps
CarryMap	Paint.net
Cityworks extension	Pictometry
Cloud resources	Plotter
Copy machine	Printer
Email	QGIS
ESRI Suite	Scanner
Fax	Survey equipment
Field calculator	Tool Box
Geoprocessing	
Global Mapper	
Google Earth	
GPS equipment	
Manifold GIS	

Acronyms

BIM-Building Information Modeling
 CAF-Combined Adjustment Factor
 COGO-Coordinate Geometry
 DEM-Digital Elevation Model
 DTM-Digital Terrain Model
 File Types- SHP , PDF, KMZ, TIFF, Mosaic
 FTP-File Transfer Protocol
 GRAMA-Government Records Access and Management Act
 IMS-Internet map service
 PDOP-Positional Dilution of Precision
 PLSS-Public Land Survey System
 RMS-Records Management System
 SCADA-Supervisory Control and Data Acquisition
 SQL-Structured Query Language

Future Trends

3D printing
 Application (APP) development
 Automatic data collection
 Cloud services
 Cloud data storage
 Crowd sourcing
 Dashboards
 Drones
 GIS Integration (Google as a force)
 Mobile applications
 Off-line data collection
 On-line
 Open source applications
 Real-time aerials
 Real-time solutions
 True 3D
 Ultra-high speed broadband
 Vehicle automation (tractors, Google car)

DACUM Research Chart for GIS Specialist

DACUM Panel

Jordan Behunin, GIS Specialist, **Carbon County**, Price, UT
 Kimberly Coburn, Environmental Staff Engineer/GIS Analyst, Engineering, **Epic Engineering**, UT
 Mellissa Lasslo, GIS Specialist, **Carbon County**, Price, UT
 Matt Stones, Assistant Utilities Controller, Facilities Management, **University of Utah**, Salt Lake City, UT
 Andrew Thorup, GIS Specialist, Public Works GIS Division, **City of West Jordan**, West Jordan, UT
 John Udseth, Senior GIS/Intelligence Specialist, **Salt Lake City Police Department**, Salt Lake City, UT

DACUM Facilitator

John Johnson, GeoTech Center, Facilitator
 Steven Lizotte, Salt Lake City Community College, Recorder

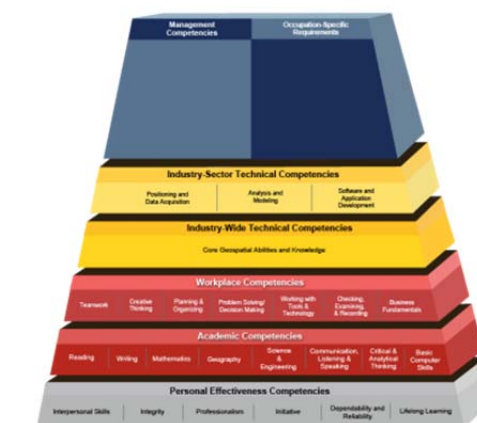
Sponsored by:

The National Science Foundation;
Advance Technology Education



This material is based upon work supported by the National Science Foundation under Grant No. DUE ATE 1304591. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

Produced by:



*U.S. Department of Labor
 Geospatial Technology Competency Model*

Date: March 27 & 28, 2014