

Raena Ballantyne DeMaris, MS-GIST, GISP

Principal Consultant / GIS Analyst / Cartographer

DeMaris Integrated GeoSpatial Solutions, LLC (DIGS)

3219 N Wellington Place, Spokane, WA 99205

509.847.5972 | raena@demarisIGS.com | www.DeMarisIGS.info

Summary

My name is Raena (RAIN-uh, she/her). I specialize in GIS related to Environmental and Social Sciences, Data Visualization/Cartography and Web GIS. In August 2022 I earned an MS-GIST from the University of Arizona with a 4.0 GPA and a superior rating on my capstone project. In December 2022, I was awarded my GIS Professional Certification (GISP). I possess diverse skills in raster and vector spatial analysis, remote sensing and imagery processing, Web GIS, workflow automation, cartography and data visualization, and database design/management. I am practiced at designing complex workflows; in analyzing data and imagery for complex environmental projects; in problem-solving and research; and in ESRI Products. I have worked in productive collaboration with agencies, non-profits, private entities, and for-profit businesses to create, analyze, and deliver GIS products that achieved a variety of project goals. I am responsive, attentive to quality, and always apply best practices to every project. [Orange hyperlinks](#) lead to project examples.

Distinguishing Qualifications

- Master of Science in Geographic Information Technology (MS-GIST), 4.0 GPA; Superior rating of [Capstone Project](#)
- 14 years of progressive expertise in GIS data analysis and management for environmental and social sciences
- Designed and publication of a map in Paul Lindholdt's Book, [The Spokane River](#) (2018, University of Washington Press)
- 12 years of experience in cultural resource management and archaeology in public and private sectors

Education

MS-GIST, University of Arizona, 2022

ND, Pennsylvania State University, GIS coursework 2010-2011

GIS Certificate, Eastern Washington University, 2009

ND, University of Oregon, coursework toward a Master of Science in Historic Preservation, 2003-2004

Bachelor of Arts, Anthropology, minor in Conservation Biology, Brigham Young University 2002

General Skills

ESRI Desktop (ArcGIS Pro 2x to 2.9) and legacy ArcMap 2x to 10.8 software; ArcGIS Products

Microsoft Office Suite

Adobe Suite including Acrobat, some Illustrator and Photoshop

Administrative Tasks such as bookkeeping, project scoping and budgeting

Technical Skills

GIS Data Compilation, Management & Administration. Geodatabase design, construction and maintenance using ESRI Products, Microsoft products; QA/QC design and implementation including topology, coded/range domains; imagery/document georeferencing; heads-up digitizing; spatial and attribute data editing; CADD integration; legacy GIS format conversion; [historic data and map](#) research.

Raster GIS Analysis including but not limited to:

- Landform and terrain analysis
- [3D modeling](#)
- Image mosaicking
- Elevation, slope, aspect, geomorphology analysis
- Basic hydrologic modeling
- [Viewshed analysis](#)
- Object- and pixel-based imagery classification and machine learning

Using *ArcGIS Analysis*, *Geostatistical Analyst*, *Spatial Analyst*, *3D Analyst* and *GeoDa*.

Vector GIS Analysis including but not limited to:

- [Interpolation](#) of vector data to create raster datasets
- Point or kernel density analysis
- Probability modeling
- Site suitability analysis
- Queries and resulting exports as Excel or CSV tables, etc.
- Proximity analysis
- [Spatial linear regression](#) and spatial autocorrelation [analysis](#)

Programming & Automation using Python (Programming Language) and *ModelBuilder* to create efficiency in common GIS workflows.

WebGIS & Web Applications Development

Products:

- *ArcGIS Online*
- [Web Experience Builder](#)
- *Web AppBuilder*
- [ArcGIS Dashboards](#)
- *ArcGIS StoryMaps*

Customized visualizations using:

- Arcade programming language code
- HTML (for map [popups](#))
- JavaScript/CSS as needed
- Some experience with *ArcGIS JavaScript API*

Mobile GIS Design, Development & Implementation of tablet or phone-based mobile-worker data collection systems using *ArcGIS Survey123*, *ArcGIS Survey123 Connect*, *ArcGIS FieldMaps*, etc. Field GIS data gathering also includes use of older *Trimble* and *Garmin GPS* data collection techniques, including data dictionary design and implementation. Training of field personnel on data collection methods, and field support of field personnel.

Remote Sensing & Imagery Management, Analysis, and Interpretation

RS Data:

- Satellite imagery
- Aerial imagery
- LiDAR

Data Products/Results:

- NDVI/NDBR and other spectral indices analysis
- Time series analysis
- Satellite imagery processing and [analysis](#)

Cartography & Data Visualization

- Maps
- [Data visualizations](#)
- [Choropleth maps](#)
- Web mapping applications (e.g., [ArcGIS Online](#), [Tableau](#))
- [Charts](#) / infographics
- [Reference maps](#)
- [Interactive maps](#)
- [Profiles and cross-sections](#)
- Graphs
- [Thematic maps](#)
- Heatmaps
- Digital formats (e.g., PDF, JPG, PNG, AI)

Metadata Documentation to document data development methods, quality, precision, accuracy, geoprocessing, publication, attribution, etc.

Open-Source Data & Software capabilities including *QGIS*, *Google Earth*, *GitHub*, *GeoDa*

Representative GIS Client Work

GIS Data Manager & Consultant for Whitworth University Facilities Department, January 2023-June 2023

- Maintain and update GIS data for campus facilities; fully automate mobile GIS data collection for staff using *ArcGIS Online FieldMaps*
- Arboretum data maintenance using *TreeWorks*

GIS & Cultural Resource Support for Archaeological & Historical Services of Eastern Washington University, September 2019-present

- Provided Geodatabase design input for Washington State Parks; built and populated the database using coded domains, topology, and other QA practices
- Provided GIS support for projects for Spokane Public School District, Oregon Department of Transportation, Idaho Department of Transportation, Washington State Parks and Recreation Commission, the Federal Highways Administration, the Bureau of Land Management, and private clients, among others
- Created efficiency in field data collection by designing a field data collection form in *Survey123 Connect* which enables automatic population of agency-required data form submittal documents through Mail Merge.
- Analyzed historic and modern maps and data to support preparation of archaeological field survey and subsurface testing methodologies. Map sources include historical engineering drawings and XY coordinate data; historic USGS topographic maps, historic Government Land Office (GLO) maps, historic aerial imagery, historic archaeological site forms
- Produced project FieldMaps for data collection and monitoring projects
- Created, edited, maintained, and shared field-collected data in support of cultural resource field survey and reporting and archaeological site inventory mapping for Bureau of Land Management (BLM) projects.
- Prepared maps and graphics in support of field methodology proposals
- Automated preliminary spatial research tasks using *ArcGIS ModelBuilder* workflow
- Analyzed datasets listed above in support of field safety measures for archaeological survey (e.g., steep slope)
- Prepared cultural resource survey report maps and graphics in Adobe formats to state and Federal Section 106 regulations
- Prepared archaeological site inventory maps to state, agency, and federal standards

GIS Analyst, GIS Data Manager, Consultant for GRAM Northwest, LLC, June 2019-present

- Managed all geospatial data for the cultural resource department
- Facilitated transition to an all-online digital data collection methodology, which includes training people in the use of *FieldMaps*, and designing *Survey123 Connect* Data collection forms
- Produced archaeological probability models using highest-quality authoritative datasets and authoring technical methods and results reports
- Provided an array of maps and graphics for inclusion in reports and memos, etc.

GIS Analyst, Consultant & Cartographer for Edward Bryant, Consulting Exploration Geologist, May 2021-present

- Provided GIS digitization and cartography services of geology fieldwork data for mining projects
- Produced geologic maps using USGS cartographic standards
- Produced geologic cross sections using field data and assay values
- Developed online and mobile GIS field data collection through ArcGIS Online

GIS Analyst & Consultant for Viva Gold Corporation, August 2022-present

- Designed and populated a project geodatabase with 30 years of environmental permitting and project data
- Incorporated geochemical analysis results into datasets
- Created graphics for press releases

GIS Data Manager & Consultant, GIS Data Manager, GIS Services for the Waterkeeper Alliance, August 2019-November 2022

- Managed All GIS data for the Organization in ArcGIS Online.
- Managed ArcGIS online account, including groups, users, credits.
- Created web maps and ESRI Experience Builder Web apps displaying threats to water quality for waterkeeper jurisdictions across the globe. ArcGIS online configuration includes Arcade programming, HTML coding, and JavaScript programming for popups, widgets, and layout.
- Mapped hazardous materials spill response for press releases
- Edited, managed, and shared geodata in ArcGIS Online geodatabases and files in support of the Waterkeeper Alliance's Global waterkeeper programs and new website release

GIS Consultant & Cartographer for Midcoast Conservancy, May 2021-March 2022

- Created a [custom Kiosk map](#) showing protected lands, public preserves, and service area boundary along with created DEM hillshade and bathymetry layers. Used client's custom color palette and fonts to produce the poster-size 34" x 44" map.
- Maps for marketing, public donation outreach
- Custom web-app and web-map design and implementation using ESRI Experience Builder, Arcade programming, HTML coding and JavaScript

GIS & Cultural Resource Support for Mission Support Alliance, July 2014-May 2020

- Designed, created, and edited a Review Areas feature class including standardized coded domain fields for the Hanford Site to include all Cultural Resource Review areas since 1987. Coded domains ensure standardization, ease and efficiency of data entry and reliable query-ability.
- Designed, edited, managed, and shared geodata from shapefiles and geodatabases in support of the CHRP program
- Developed Area of Potential Effect Areas and GIS data for cultural resource and ecological resource evaluations and clearance letters

- Developed and maintained a Site Monitoring database for the Section 110 monitoring program; provides site maps, GPS data and data tables for ongoing monitoring efforts
- Developed a Hanford Sitewide historic 1943 land ownership dataset from Hanford Engineering Works Data
- Developed Hanford Sitewide GLO-era Land Patent dataset from online archives
- Through a series of overlays, extractions, geoprocessing, and analysis, created an updated version of the [Biological Resource Management Plan Resource Levels GIS Data, including figures for the report](#)
- Created annual [wind rose maps](#) and [graphics](#) for the Meteorological station monitoring program
- Completed metadata to FGDC standards for datasets in preparation for public release clearance
- Created maps and shared GIS data for the annual Environmental Surveillance Master Sampling Plan of air, soil, water, vegetation, TLDs, etc.
- Created maps and GIS data for the quarterly radiological Contamination Events report
- Created maps of migratory bird protection areas, elk monitoring, and other wildlife
- Performed geoprocessing and spatial analysis of disturbance areas for the Terrestrial Baseline ecological assessment project
- Provided comparative analyses of project alternatives in terms of cultural resource impacts to guide NEPA decision-making activities as well as for Remedial Investigation/Feasibility Study (RI/FS) projects
- Designed, created, and published maps and graphics to accompany cultural resource reports, project reports, archaeological site forms, etc.
- Completed dozens of archaeological site forms and WISAARD uploads upon document approval
- Amassed and organized geospatial data for use in supporting project documents. Data sources include ArcGIS servers, geospatial data clearinghouses, government agencies, and clients
- Georeferenced historic aerial imagery and maps as well as modern and historic engineering drawings for use in Area of Potential Effect development and project support
- Provided recommendations and input on best management practices for geospatial data collection and management for CHRP GIS data
- Served as technical phone support for staff using Trimble GPS and ArcGIS software

GIS Analyst for the Native Conservancy & Baum Foundation, September 2019-December 2019

- [Site suitability/optimal suitability analysis](#) project involving raster and vector analysis to produce preliminary siting for potential kelp farms with the goal of Alaska Native food sovereignty and subsistence security

- Analyzed GIS raster and vector data to produce preliminary siting for potential kelp farms with the goal of Alaska Native food sovereignty and subsistence security to include optimal site suitability factors (e.g., depth below sea level, exclusion areas, salinity, temperature, dynamism, special uses, slope, etc.)
- Gathered base maps and datasets in support of a kelp siting study within the Exxon Valdez Oil Spill Zone

Cartographer for Energy and CwM H2O, May 2015-July 2016

- Produced [Claim of Beneficial Use](#) and other water permitting mapping products
- Amassed and organized geospatial data using the latest imagery and data sources for hydrology, cadastral survey delineations, and tax parcels

GIS Analyst & Cartographer for Washington Closure Hanford, June 2011-September 2015

- Performed 3D GIS modeling and analysis and prepared reports using ESRI's 3D and Spatial Analyst Extensions in support of cultural resource project decision-making on the Hanford Nuclear Reservation
- Designed and created geodatabases in coordination with client and agency input
- Designed, created, and published maps and graphics to accompany cultural resource reports, project reports, archaeological site forms, etc.
- Amassed and organized geospatial data for clients. Data sources include ArcGIS servers, geospatial data clearinghouses, government agencies, and clients
- Georeferenced historic aerial imagery and maps as well as modern and historic engineering drawings
- Researched, digitized, maintained, and shared feature datasets of historic land ownership/land/patents from the 1860s through the 1950s
- Wrote reports describing GPS/GIS field data collection and analysis methodology and results
- Designed, created, and used Trimble GPS data dictionaries. Corrected, exported, and edited Trimble GPS data and integrated the data into geodatabases and shapefiles
- Served as technical phone support for clients using Trimble and Garmin GPS units in the field
- Authored, co-authored, and contributed to numerous formal reports and internal documents
- GIS Support for Columbia Valley Archaeological Services, June 2011-present
- Used topographic, General Land Office (GLO) maps, historic maps, and historic and modern aerial imagery in the creation of APE and site form maps for inclusion in Section 106 reports
- Used Garmin GPS data to generate shovel test location maps
- Digitized excavation and shovel test unit profile drawings in GIS using field notes, drawings, and photographs

GIS Support for Northwest Cultural Resources Services, January 2014-present

- Produced maps in GIS for inclusion in project reports

GIS/GPS Analyst for Lahren Associates, January 2012-December 2013

- Performed a GIS needs and level of effort GIS assessments on a project-specific basis for each project's cultural resource component.
- Acquired, managed, and organized GIS base data
- Converted between CAD and GIS data formats
- Converted between Garmin GPS files, KMZ/KML (Google) and shapefiles, edited Garmin data
- Generated 10-, 20-, and 100- ft. contour lines from digital elevation models (DEM)
- Calculated distances, acreages, and XY coordinates from GPS data and field notes
- Georeferenced and interpreted historic map data and aerial imagery.
- Performed raster-based slope analyses for delineating areas unsafe for pedestrian survey

Volunteerism

GIS Analyst for Waterkeeper Alliance Coal-Ash Pilot Project: Development of Web GIS and Thermal Infrared Imagery Processing Tools for Preliminary Correlation Between Stream Temperatures and Proximity to Coal-Ash Waste (284+ hours Spring/Summer 2022)

- Designed [workflows](#) to meet three project goals
- Performed research and data gathering including data suitability; designed the project workflow
- Produced [Interactive Web GIS maps and Apps](#)
- Created a complex *ModelBuilder* model to prepare remote sensing thermal infrared imagery product for analysis
- Conducted [bivariate spatial correlation analysis between water surface temperature and proximity to coal-ash waste locations](#)
- [Authored a technical report introducing the project and topic, outlining the methodology, analysis, and outcomes](#)
- Produced professional map products for inclusion in the technical report
- Prepared a [video recorded Power Point presentation](#) of the project and results

Cartographer and GIS Consultant for the Spokane Riverkeeper/Center for Justice, October 2011-February 2012; November 2014 (*unpaid volunteer position on-call as needed*)

- Designed and created a [custom map for the Spokane Riverkeeper's educational outreach efforts](#)
- Geocoded and mapped national waterkeeper alliance addresses
- Advised and consulted on the ways that GIS might aid the Spokane Riverkeeper program
- Mapped water quality data from stormwater drains, sewer overflows, etc.

Awards

- December 2016 Award for excellence, innovation, client responsiveness and ability to anticipate needs and work independently within Mission Support Alliance (nominated by Aaron Fergusson)
- 4 CH2M HILL recognition awards from project managers and co-workers in 2009 for outstanding client service, expertise in cultural resources, and excellence in responsiveness to GIS and cultural resource project needs

GIS NEPA Experience (through employment at CH2M HILL)

GIS Analyst, North-of-the-Delta Offstream Storage Project (NODOS), California Department of Water Resources, 2010-2011. Provided GIS support for Environmental Justice discipline (minority, low income, and relocations) project components in support of the EIS/EIR, including U.S. Census data integration and mapping. Analyzed parcel data to create minimum project take acreages by project feature, provided GIS data to the client. Analyzed land use data to determine minimum agricultural take acreages and parcels. Provided figures for inclusion in technical study reports including transportation, sensitive receptors, and land use in support of the EIS/EIR.

Archaeologist and GIS Specialist; Odessa Subarea Special Study DEIS; Bureau of Reclamation; Central Washington; 2009-2011. Gathered historical data relating to cultural resources; georeferenced historical maps and created a geodatabase for cultural resource-related data. Digitized cultural resource data, performed complex analysis of existing current and historical data that resulted in an [archaeological predictive model for the project area to be used in alternatives selection and future project implementation; contributed to the cultural and historic resources sections of the DEIS](#)

GIS Specialist; Lewis Street Overpass Project; City of Pasco; Pasco, WA; 2009-2010. Created demographics maps for low income and minority groups for the Environmental Justice, Relocations, and Hazardous Materials Section 4(f) and Cultural Resources Technical Memoranda

Archaeologist and GIS Specialist; Pine Bluff Arsenal Armed Forces Reserve Center Environmental Assessment/BRAC Project; US Army Corps of Engineers, Mobile District; Pine Bluff, Arkansas; 2008-2009. Performed SHPO research and Arkansas Archaeological Survey research for the project area; conducted fieldwork and GPS data collection; generated cultural resource maps, including project overlays of historical GLO cadastral maps for inclusion in the final report; coordinated Tribal Consultation and created maps for distribution to the Tribes and SHPO; authored the final report which received SHPO concurrence; authored the cultural resource EA sections

Archaeologist and GIS Specialist; Vancouver Armed Forces Reserve Center Environmental Assessment /BRAC Project; US Army Corps of Engineers, Mobile District; Vancouver, Washington; 2008-2009. Conducted SHPO research for the project area; conducted fieldwork and GPS data collection; generated cultural resource maps, including project overlays of historical GLO cadastral maps for inclusion in the final report; coordinated Tribal Consultation and created maps for distribution to the Tribes and SHPO; authored the final report which received SHPO concurrence; authored the cultural resource EA sections

Archaeologist and GIS Specialist; Everett Armed Forces Reserve Center Environmental Assessment/BRAC Project; US Army Corps of Engineers, Mobile District; Everett vicinity, Washington; 2008. Conducted SHPO research for the project area; conducted fieldwork and GPS data collection; generated cultural resource maps, including project overlays of historical GLO cadastral maps for inclusion in the final report; coordinated Tribal Consultation and created maps for distribution to the Tribes and SHPO; authored the final report which received SHPO concurrence; authored the cultural resource EA sections

Archaeologist and GIS Specialist; Great Falls Armed Forces Reserve Center Environmental Assessment / BRAC Project; US Army Corps of Engineers; Great Falls, Montana; 2008. Conducted SHPO research for the project area; generated cultural resource maps, coordinated Tribal Consultation, and created maps for distribution to the Tribes and SHPO; authored the final report and EA sections which received SHPO concurrence; authored the cultural resource EA sections

Archaeologist and GIS Specialist; Butte Armed Forces Reserve Center Environmental Assessment /BRAC Project; US Army Corps of Engineers; Butte, Montana; 2008. Conducted SHPO research for the project area; conducted fieldwork and GPS data collection; generated cultural resource maps; coordinated Tribal Consultation and created maps for distribution to the Tribes and SHPO; authored the final report which received SHPO concurrence; authored the cultural resource EA section

Archaeologist and GIS Specialist; Hayden Vicinity Armed Forces Reserve Center Environmental Assessment /BRAC Project; US Army Corps of Engineers; Post Falls, Idaho; 2008. Conducted SHPO research for the project area; conducted fieldwork and GPS data collection; generated cultural resource maps; coordinated Tribal Consultation and created maps for distribution to the Tribes and SHPO; authored the final report which received SHPO concurrence; authored the cultural resource EA sections.

Representative GIS Project Work (through CH2M HILL)

GIS Cultural Resource Specialist, South Sand Creek Byway Project, Idaho Transportation Department, Sandpoint, Idaho; 2006-2007. Created a Microsoft Access Database designed to catalog the data recovery artifact collection (database could be converted for use in GIS); designed maps of archaeological sites based on GPS data collected during cultural resource monitoring activities for sites discovered during project construction. Contributed to memoranda, reports, and site forms.

GIS Analyst, 100-H-63 Waste Site Project, CHPRC/DOE Hanford Site, 2010. Used existing topographic data in ArcGIS ArcInfo 9.3 3D Analyst to determine the depth of fill overlaying cultural resource sites in support of cultural resource monitoring recommendation.

GIS Specialist; Lewis Street Overpass Project; City of Pasco; Pasco, WA; 2009-2010. Created demographics maps for low income and minority groups for the Environmental Justice, Relocations, and Hazardous Materials Section 4(f) and Cultural Resources Technical Memoranda.

Cultural Resource GIS Specialist; Hanford North Slope Debris Removal Project; Department of Energy; Hanford Site; 2010-11. Georeferenced 1943 aerial imagery, designed, created, and managed a large geodatabase including raster imagery, vector data, and incorporated GPS data, created maps and figures for report deliverables including Site forms and Section 106 reports; analyzed GIS data to determine which project components are in culturally sensitive areas, designed strategies and spatial approaches to managing the project components.

Archaeologist and GIS Specialist; Hanford D&H Area Pump-and-Treat Project; Department of Energy; Hanford Site; 2009. Gathered GPS data and performed archaeological subsurface testing, excavation, and site documentation; geo-referenced historic GLO maps and aerial photos; created report figures.

Archaeologist and GIS Specialist; Hanford Burn Survey, PNNL, 2010. Managed GPS data collected during the site update documentation of nearly 60 archaeological sites. Updated all site forms, created maps and sketch maps for site forms, created maps for the project report.

