SUDHIR RAJ SHRESTHA, GISP

Esri Science and Civilian Team

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WORK EXPERIENCE

Solution Engineer, Esri Science Team, Vienna, VA, June 2015-present

Lead and advise NOAA and NASA on building novel data integration solutions to support the ecological service that reaches out to larger users and science community.

Develop and lead the team to develop the data policy and craft the solutions for appropriate data integration that follows the guidelines and standards of operation of the agency.

Collaborate and advise NOAA NWS to implement GIS capabilities to support National Water Model.

Develop and train NOAA, NASA, DOE, EPA customer on application of geospatial data management and analysis and implementation in hydrological modeling and support the product for Integrated water resource management (IWRM)

Advise and recommend the novel solutions and the use of new emerging technology, the development of new tools, evaluate the needs of technology gap of staff to create tools today that will meet the needs of the future.

Lead, advise and support NOAA and NASA on building earth science geo-spatial data and architecture capabilities to improve and integrate the data access, discovery, interoperability, visualization & sharing.

Advise and support federal customers on building integrated and collaborative network of information management and decision support tools for the service including ecological services.

Advise and build solutions for NOAA, NASA, EPA and USGS on delivering data and decision support information and tools through web based online system in a strategic, integrated, and holistic way.

Develop suitable database and geospatial solutions to customers that support data information like comprehensive inventory of wetlands and coastal barrier maps, environmental contaminants, forest cover and soil properties.

Advise and collaborate with federal agencies, local and state government, software developers, system engineers and managers to develop innovative GIS software tools and solutions.

Provide leadership in geospatial systems design, management, project management, contractual support, planning, cost analysis, and coordination and evaluation of our decision support needs and tools for NOAA and NASA customer.

Advise, lead and help build and implement the GIS enterprise that supports the multidisciplinary areas such as infrastructure, facilities management and environmental resource distribution.

Lead and coordinate the GIS support in various research applications development such as web services, web based tools development that maximizes the use of geo-spatial data to larger group such as private industry, local, federal governments and research institutions.

Provide technical expertise on Esri's complete ArcGIS enterprise to include Desktop, Server, Web Maps, Portal, ArcGIS Online, OpenData, WebApp and Mobile. Support and advise Office of Science and Technology (OSTP)

White House on geospatial data integration and Open Data initiative for improved data discovery, access and interoperability.

Evaluate emerging technologies for analysis, processing, and display of Earth science, facilities data. Design standards-based procedures and software tools in cloud for real time Earth science sensor data ingest, processing, analysis and visualization.

Few accomplishments:

Led team(s) that developed or implemented data policies, guidelines, procedures, and standards of operations for federal agencies

Developed prototype of scientific multidimensional data management workflow and spatial analytics for earth science data that can be replicated for most of the multidimensional data

Invited by OSTP, White House as subject matter expert to support the national Call to Action and forming an interagency group to protect America's soil

Invited by George Mason University to give talk on geospatial science and current applications using Esri platform

Featured article in American Geophysical Union on Crowdsourcing Geoscience Developed Desktop and cloud solution for data management and processing, analysis and visualization

Enterprise GIS Specialist/ Metadata and Data Interoperability Lead, Cyberdata Technology/ NOAA Integrated Dissemination Program (IDP) GIS, College Park, MD, October 2014-June 2015

Provided technical support and advise NOAA National Weather Service (NWS) Enterprise GIS Project of Integrated Dissemination Program (IDP-GIS) leadership.

Provided technical service; advise on the installation, maintenance, and administration of enterprise Esri ArcGIS server, GeoServer, enterprise geospatial databases and related components, and other GIS-related server/software.

Advise and support NOAA National Weather Service on building integrated and collaborative network of information management and decision support tools and web services that can support disaster management, drought and water management.

Advise and build solutions for NOAA/ NWS on delivering data and decision support information and tools through web based online system and tools that supports several agencies for environmental conservation and weather forecast and disaster management in strategic, integrated, and holistic way.

Advise and assist in development of web-based GIS tools that is designed to increase utilization of weather and climate geospatial data that helped seamlessly interoperate IDP-GIS data and products for any users including federal, state, local agencies and private industries.

Lead and advise NOAA on building novel data integration solutions to support various agencies that support ecological service, weather-based decision making that reaches out to larger users and science community.

Develop and lead the team to develop the data policy and craft the solutions for appropriate data integration that follows the guidelines and standards of operation of the agency.

Advise and provide the technical leadership to GIS Users, project implementation services, GIS technical support services, coordinate project work for programs, provide user training services, perform application troubleshooting and optimization and write and maintain clear, concise documentation for all GIS Systems and databases.

Support the NOAA environmental data flow and management that included multidimensional data for radar including HRRR (high resolution refresh radar).

Present the IDP-GIS effort to scientific community like AGU, NSF (EarthCube), Esri.

Collaborate and communicate with other federal agencies including NSF (EarthCube), NASA, USGS and FAA to advance the Data Interoperability effort.

Support Esri IDP-GIS enterprise architecture on Dev, QA and Operational environment on maintenance and administration of the GIS web Services.

Provide planning support and guidance for environmental geospatial data growth to serve multiple programs. This includes data management policies, procedures

Provide support in conjunction with Esri to NOAA line offices on GIS application, database, web server, file storage, Windows and Linux system administrations support.

Provide support and advise on overall GIS data management, managed data policies and procedures, and coordinated data access, backup, and archiving policies.

Advise and perform data model implementation, database security, database performance tuning, data backup and recovery, data replication, and write and maintain clear, concise documentation for all GIS Systems and databases.

Few accomplishments:

Developed Data flow script that pulls and refreshes the wider variety of NOAA geospatial data to the database for the web services in collaboration with Esri. This script is part of NOAA National Weather Service operational Geospatial data support.

Developed data management policy, guidelines, procedures, and standards of operations for NOAA IDP GIS program.

Advised and collaborated with Esri to build NOAA National Weather Service operational IDP-GIS enterprise architecture, which delivers NOAA operational data as GIS web Services (http://idpgis.ncep.noaa.gov/arcgis/rest/services)

Developed GIS and Remote Sensing training courses and workshop to keep the scientists, managers and developers foster the appropriate timely solutions.

Developed the template and automated process to create the FGDC, ISO 19115 compliant metadata for IDP-GIS data and web service and provided trainings and guidance to the data owners.

Served as the Interoperability and data management resource person for the NSF EarthCube program.

Scientific Data Specialist/ Metadata and Data Interoperability Lead, Wyle ST & E/INNOVIM /NOAA Climate Prediction Center (CPC), College Park, MD, October 2010-October 2014

Provide guidance and support to NOAA Climate Prediction Center for GIS analysis and dissemination; assists with the implementation for multidisciplinary efforts on the application of weather forecast data by federal and private agencies to address infrastructure, planning, and environmental impact assessment.

Lead and Develop Data Access and Interoperability System project and prototype for Climate Portal (www.climate.gov).

Lead, advise and support the CPC team in the effort to manage climate data and its conversion to suit the entire geospatial platform to integrate Data Interoperability from climate portal perspective.

Lead, develop and manage the development of FGDC Content Standard for Digital Geospatial Metadata (CSDGM) and ISO 19115 compliant metadata for NOAA CPC data in Climate Portal (www.climate.gov).

Advise and assist NOAA CPC staff and Scientists in writing, editing metadata that is FGDC and ISO 19115 compliant.

Develop and conducts GIS and metadata training to the staff and other collaborating partners.

Lead the management of NOAA CPC metadata to push it to the www.data.gov and NOAA NCEI Geoportal Server.

Advise and support CPC scientists and staff in the geospatial application development to augment their research.

Support and collaborate with ESRI Raster and imagery core development team on development of multidimensional data support (grib, netCDF, HDF) thatwill be part of upcoming ArcGIS 10.3.

Support and advise National Weather Service (NWS) Integrated Dissemination Program (IDP) project as technical team expert to design the system architecture, work flow for ESRI and GeoServer, which will become operational GIS infrastructure.

Plan and coordinate the climate.gov geospatial data development, spatial analysis, prototype development and visualization to meet the standardrequirements and push the data to GIS web map services to National Weather Service IDP (Integrated Dissemination Program).

Coordinate the effort on CPC geospatial data management, access, archiving and interoperability effort from climate portal perspective.

Support and co-lead metadata team, Climate Watch team in Climate Portal (www.climate.gov). Develop and test the prototype on synchronizing CPC geospatial data in Geoserver as Pilot project that published the web services that are easily consumed for quick data access and visualization.

Support the design and development of CPC Web page development and geospatial data integration and connecting it with climate portal. Develop and support in managing geospatial (GIS/Remote Sensing) application including ESRI Geoportal Server.

Support climate portal and NOAA CPC for climate data (geospatial, earth observations, forecast, model) management, manipulation and visualization. Port CPC geospatial datasets and products into the NOAA Climate Portal (www.climate.gov).

Support and assist the development of NOAA climate watch magazine (bringing science to users) and Data Snapshot of climate.gov.

Lead and support the effort of CPC in producing the climate data reachable to larger/diverse user groups. Lead the collaboration effort on Data Interoperability with San Diego Super Computer Center as a part of NSF EarthCube and Climate.gov/ CPC.

Few accomplishments:

Developed Climate Forecast System data (CFSv2 Monthly Mean 2m Temperature Anomalies) in GIS compatible format that is used by NOAA NWS in Alaska (http://www.cpc.ncep.noaa.gov/products/partnerships/alaska.php)

Developed guidelines for the Collection Level Metadata Standards (FGDC CSDGM and ISO 19115) for weather and climate observation, model & forecast data for NOAA Climate Prediction Center Invited to advise and assist interagency working group (US Global Change Research Program) to develop the Data Management Policy for the Global Change Information System (GCIS)(http://data.globalchange.gov/)

Invited to serve as panel reviewer on NASA ACCESS Research Proposal Review for the Data Access, Interoperability and management section

Expanded the interoperability of geospatial data and support for weather and climate forecast data in NOAA climate portal (www.climate.gov) Improved the NOAA Climate Prediction Center geospatial data discovery by creating the FGDC CSDGM and ISO 19115 compliant metadata that was consumed and delivered through Geoportal sever to data.gov and climate.gov 2014

Webby Award winner team for NOAA climate portal (www.climate.gov)

Served as the Interoperability and data management resource person for the NSF

Programmer Analyst II, University of California Merced, June 2008-October 2011

Develop GIS, Remote Sensing and Statistical software to automate wildfire forecast models. Advise and assist staff and students at UC Merced and other University of California and USDA Forest Service locations with developing and programming GIS tools.

Design and develop new GIS and fire forecasting systems and enhanced existing systems, including hydrologic models (VIC), statistical software libraries, and numerical methods software libraries. Build, manage, updated and recommend a large spatial program on geospatial fire history database, satellite image processing that feeds into statistical forecasts of wildfire season severity.

Provide guidance and leadership to UC Merced and Climate Applications lab, which manages GIS support. Assist, UC Merced Climate Applications lab on GIS implementation to support multidisciplinary research programs, organizations and federal, state and local agencies.

Analyze data for quality assurance and visualization in support of research projects and research grants undertaken by the principal investigators. Advise and assist in development of web-based tools designed to increase utilization of spatial data and GIS tools for federal, state, and local agencies to consume the wildfire forecast during fire season.

Support research in the Sierra Nevada Research Institute (SNRI) at UC Merced in applied climatology and statistical modeling for wildfire, energy and water resource management applications.

Develop and facilitate GIS based training courses for students, program managers and facility and planning advisors.

Develop and manage users' manuals and technical documentation and FGDC standard metadata for the wildfire data and products.

Write peer reviewed articles and present at conferences.

Few accomplishments:

Designed and developed GIS tools to support fire-forecasting systems to that enhanced the existing systems. Designed and developed geospatial and statistical tools and libraries that were integrated to interoperate hydrological models and climate models output to support wildfire forecast.

Designed and developed metadata catalog for the Climate Applications Lab for better search, discovery, and dissemination of model and forecast data.

Developed web-based tools designed to increase utilization of spatial data and GIS tools for federal, state, and local agencies to consume the wildfire forecast during fire season.

Designed and developed information visualization and analysis modules for wildfire data.

Geospatial Analyst, NOAA-Environmental Cooperative Science Center (ECSC), Florida A&M University.

November 2007-June 2008

Produce, analyze and rectify images for the classifications of coastal wetlands, estuaries, near shore habitats and submerged aquatic vegetation.

Assist and support the NOAA Environmental Cooperative Science Center (ECSC) team in application of hydrodynamic model.

Manage and analyze high-resolution hyper spectral airborne (AISA-Eagle imagery and its flyover data) and satellite imagery.

Manage and provide overall geospatial data (vector, raster gridded as well as multiband hyperspectral) management for the center.

Advise NOAA science center leadership on use and need of GIS software and training needs for the collaborating scientist, students and staff.

Coordinate in developing the data backups policy for the center.

Develop online courses and workshops on GIS and Remote Sensing related topics using software like ENVI,

ArcGIS, and DGPS for the Center's students, faculty, and affiliated staff at partner NOAA research reserve.

Provide analytical and liaison support to geospatial scientists and staff at the Center for Advanced Land Management Information Technologies at the University of Nebraska and NOAA.

Develop and manage spatial geodatabase and web data dissemination.

Perform data analysis for quality assurance.

Few accomplishments:

Developed online courses and workshops on how to use GIS and Remote Sensing software like ENVI,

ArcGIS, and DGPS for the Center's students, faculty, and affiliated staff at partner NOAA research reserve.

Advised and assisted graduate students on their research and application development, analysis using GIS and remote sensing tools.

GIS Technician II, City of Merced, California. May 2007-November 2007

Develop geospatial tools to automate mapping.

Support and assist City of Merced Public works department GIS data management and workflow.

Support the City Police department in geospatial technical development and spatial analysis on need basis.

Support and assist city planning division and public works department in development and redevelopment plan using GIS and CADD.

Develop and conduct training in the application of ArcGIS, Arc Explorer and Google Earth based Mapping tools and Differential GPS (DGPS) application.

Create, edit and update the database/datasets of sewer line, storm drains, manholes and water pipe lines. Develop and create the FGDC compliant metadata for the GIS datasets.

Data collection and analysis using differential GPS: Trimble R8 GNSS series survey-grade GPS receivers and TSC2 controller and GeoXT.

Few accomplishments:

Led the mapping effort for manholes, traffic lights and sewer lines and infrastructures and developed geospatial database to manage GIS datasets.

Developed integrated GIS systems and maps of utilities and land use.

Created the 1st digital map book/ atlas for the City of Merced. It was used by the operators and field staff/ dispatchers to quickly locate the problem area to fix.

Graduate Research Assistant and GIS Teaching Assistant, University of Wyoming. September 2003-December 2006

Developed a semi-automated soil heuristic model to map and predict spatially explicit soil characteristics using high-resolution data (LiDAR, IFSAR and NED) and test its accuracy of prediction (for US Army Corps of Engineers).

Developed and completed projects on estimating the erosion potential in Walnut Gulch watershed, Arizona, using Universal Soil Loss Equation (USLE).

Develop semi-automated tool to estimate channel morphology using LiDAR and IFSAR terrain data. (For USDAARS/EPA).

Moose habitat mapping and modeling using ArcGIS and ENVI.

Spatial data analysis of soil texture distribution in landscape. Organized workshops, meetings and a talk program as the president of American Society of Photogrammetry and Remote Sensing-Rocky Mountain Region student chapter.

Modeled Runoff at the watershed, basin scale in Arizona using AGWA, SWAT, KINEROS2 and ATiLLa.

Developed and tested the spatial accuracy of semi-automated tool developed to estimate channel morphology using LiDAR and IFSAR terrain data. (For USDA-ARS/EPA).

Few accomplishments:

Established American Society of Photogrammetry and Remote Sensing-Rocky Mountain Region student chapter and served as President (2005-2006).

Served as reviewer for the Soil Science Society of America Journal.

Winner of American Society of Photogrammetry and Remote Sensing (ASPRS)-Rocky Mountain Chapter Merit Scholarship (2005 & 2006).

Winner of University wide Plummer scholarship (2004, 2005 and 2006).

Mapped vegetation of Jackson Hole, Wyoming using Spectral mixture analysis of Landsat MSS imagery.

Visiting Scientist, Akita Prefectural University, Japan. October 2002-June 2003.

Research on geo-hazard of earthquake and its impact on historical national monuments of Nepal.

Advise students in their research and development.

Few accomplishments:

Developed geo-hazard map based on spatial analysis of potential damage by elevation, soil types and liquefaction to be used by the government, city planners, builders, and insurance companies in Nepal.

Developed and managed the geospatial database of earthquake risk to the historical monuments of Nepal. Winner of Kubota fund (Japan) research grants (2003) to conduct research on GIS based risk analysis of historical monuments in Nepal.

Consultant, Center for Rural Technology Nepal (CRT/N), Nepal. May 2002-June 2003.

Research to identify the suitable locations for installing the hand pumps and water mills to reduce the time spent by rural women and children to reduce the negative impact of workload on their health and improve their livelihood

Few accomplishments:

Conducted spatial analysis of rural watersheds to launch a women's household energy and water project

funded by United Nations Environment Program (UNEP). Heuristic model was developed to run the spatial analysis of locations in the watershed scale with suitable population, access to water and elevation data.

Based on recommendation, appropriate technology was implemented in the village. This project is still making impact on the livelihood of women.

PUBLICATIONS, BOOK AND PRESENTATIONS

For all publications: https://scholar.google.com/citations?user=_wCq2OYAAAAJ&hl=en&oi=ao

Wyngaard, J.; Barbieri, L.; Thomer, A.; Adams, J.; Sullivan, D.; Crosby, C.; Parr, C.; Klump, J.; Raj Shrestha, S.; Bell, T. Emergent Challenges for Science sUAS Data Management: Fairness through Community Engagement and Best Practices Development. Remote Sens. 2019, 11, 179

Shrestha S.R., Tisdale M., Kopp S., Rose B. (2018) Earth Observation and Geospatial Implementation: Fueling Innovation in a Changing World. In: Mathieu PP., Aubrecht C. (eds) Earth Observation Open Science and Innovation. ISSI Scientific Report Series, vol 15. Springer, Cham

Hossain, Faisal,….Sudhir Shrestha (2017). Engaging the User Community for Advancing Societal Applications of the Surface Water Ocean Topography Mission. Bulletin of the American Meteorological Society.

Shrestha, S.R., Rosencrans, M., Pelman, K., and R. Tinker (2014). Climate Applications at National Center for Environmental Prediction (NCEP). In ESRI book "Mapping and Modeling Weather and Climate with GIS". Published in 2014.

Shrestha, S. R., Zimble, D., Wang, W., Herring, D. and M. Halpert (2014). Enhancing the Data Interoperability with Web Services. Invited talk on AGU (American Geophysical Union) in December 2014 in San Francisco.

Shrestha, S. R., Zimble, D., Herring, D. and M. Halpert (2014). Expanding the use of Scientific Data through Maps and Apps. Invited talk on AGU (American Geophysical Union) in December 2014 in San Francisco.

Shrestha, S.R. and D. Zimble (2014). Communicating Science with Scientific Data. Invited talk in "2014 ESRI International User Conference", "Weather in GIS" track, in San Diego, CA. Invited Talk by ESRI.

Rosencrans, M. and S. R. Shrestha (2014). Scientific Data Application in NOAA Climate Prediction Center. Invited talk in "2014 ESRI Federal User Conference", Washington DC.

Shrestha, S.R., Marshall, J., Stewart, J., Ansari, S., O'Brien, K., Phillips, M.B., and D. Herring (2012). Towards

Interoperable Data Access through Climate.gov, Abstract presented at 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec.

Westerling, A.L., B.P. Bryant, H.K. Preisler, T.P. Holmes, H. Hidalgo, T. Das, and S. Shrestha (2011). Climate Change and Growth Scenarios for California Wildfire. Climatic Change, 109(s1):445-463.

Westerling, A.L., Bryant, B.P., Preisler, H. K., Hidalgo, H.G., Das, T., and S. R. Shrestha (2009). Climate Change,Growth and California Wildfire. Public Interest Energy Research, California Energy Commission. CEC500-2009046-SF, Sacramento, CA.

Shrestha, S. R., Schalles, J. F., Rundquist, D.C. and Milla, K. (2008). Application of high resolution AISA Eagle Data in Coastal Ecological Research in NERR Sites. Presented in NOAA-CREST Symposium (February 20-24), Mayaguez, Puerto Rico.

Shrestha, S. R., Miller, S. N. and D. Gabrieles (2006). Soil Erosion Assessment in the Middle Mountains of Nepalusing a GIS-based model. In proceedings of AWRA 2006 Specialty Conference in GIS and Water Resources inHouston

Miller, S. N., Shrestha, S. R., Semmens, D. J. and A. Tilaye (2006). Channel morphology extraction and validationusing ground-based LiDAR. In proceedings of AWRA 2006 Specialty Conference in GIS and Water Resources inHouston.

Shrestha, S. R. and S. N. Miller (2004). High Resolution Terrain Mapping for Geomorphic and Hydrologic Study.Poster presented at the Graduate Symposium (2004) in the University of Wyoming and winner of best posteraward.

Miller, S. N., Shrestha, S. R. and D. Semmens (2004). Semi-Automated Extraction and Visualization of ChannelMorphology from LiDAR and IFSAR Terrain Data. In proceedings of ASPRS Annual Conference in Denver.

Shrestha, S. R., Karkee, M. B., Cuadra, C. H., Tokeshi, J.C. and S. N., Miller (2004). Preliminary study for evaluation of earthquake risk to the historical structures in Kathmandu valley, Nepal. 13th World Conference of Earthquake Engineering in Vancouver, Canada.

Sunuwar, L., Karkee, M. B. and S. R. Shrestha (2003). Earthquake Hazard Analysis of Kathmandu Valley for the safety of Urban Infrastructures: Probabilistic Scenarios. Presented in the Eighth National Convention and FEISCA regional meet on April 3-5, Kathmandu, Nepal.

Shrestha, S.R. and D. Bhattarai (2002). An Overview of Soil Erosion and Landslides Occurrence and Management in Nepal. Presented in the First South Asian Water Forum (SAWAF) held on February 26-28, 2002.

GRANTS AND AWARDS

American Society of Photogrammetry and Remote Sensing (ASPRS)-Rocky Mountain Chapter Merit Scholarship (2005 & 2006).

Proposal funded by Upper Midwest Aerospace Consortium (UMAC) to collect *Airborne Environmental Research Observational Camera (AEROCam)* data in Walden, Colorado in 2006.

Kubota fund (Japan) research grants (2003) to conduct research on GIS based risk analysis of historical monuments in Nepal.

Berger, Jim & Marian Grad Scholarship (2006) from School of Agriculture, University of Wyoming.

University wide Plummer scholarship (2004, 2005 and 2006).

VLIR Belgium Government Scholarship (1999-2001).

PROFESSIONAL MEMBERSHIPS

The Association for GIS Professionals (URISA)

American Meteorological Society (AMS)

American Geophysical Union (AGU)

Sigma Delta Agricultural Honor Society Wyoming Chapter (Nominated in 2005)

Sigma Xi (The Scientific Research Society)