Tammi Renninger
GIS Analyst/Owner

Elephant**Fish**

ABOUT:

Tammi is a personable and professional, data-oriented GIS Professional providing services to the water resources, geologic, and environmental industries with a focus on spatial data analysis, management, and display. She works with and supports a wide array of small business clients within Colorado and Nebraska. As the owner of ElephantFish, llc Tammi meets her clients' geospatial needs with open communication and geologic, hydrologic, environmental, and geographic know-how. Tammi works in an ArcMap environment including the 3D, Spatial, and Geostatistical Analyst extensions, as well as Aquaveo's ArcHydro Subsurface Analyst. She also works in the Adobe Suite to create high-end cartographic maps or presentation displays.

Contact Information:

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Education:

M.S. Geographic Information Science
University of Denver, Denver, CO
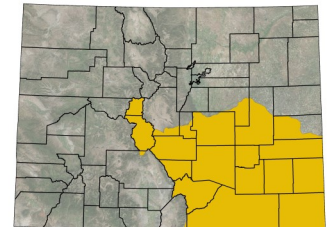
B.S. Geology
West Chester University, West Chester, PA

Memberships:

GIS Colorado (GISCO)
North American Cartographic Information Society
National Ground Water Association
Colorado Ground Water Association

Some representative GIS experience includes:

Arkansas Decision Support System

Tammi was the GIS Analyst for the team providing GIS coverages for the spatial system integration component of the Arkansas Decision Support System (ArkDSS) under management by the Colorado Division of Water Resources (CDWR) and the Colorado Water Conservations Board (CWCB). She provided data management, photo interpretation, digitization of canal and ditch extents, zonal statistics processing of NDVI-max raster datasets for irrigated/non-irrigated designations, and management of GIS best practices to efficiently work through four historical snapshots of irrigated lands. She developed a best practice methodology for assigning crop types to irrigated parcels using Landsat imagery and NDVI images through maximum likelihood classification techniques in ArcMap.

Airborne Geophysics GIS Support

Provides geospatial and hydrogeologic support for a geophysics consultant located in Nebraska who, through airborne geophysics, explores and evaluates subsurface materials for groundwater potential. Tammi supports the client by providing geostatistically interpolated grids of aquifer materials extracted from the geophysical survey as well as aerial imagery interpretation of the survey sites to enhance the flight path of the airborne survey. She creates the maps and figures included in the final reports and publications as well as provide data interpolation summaries and interpretation of the data for input into the reports.
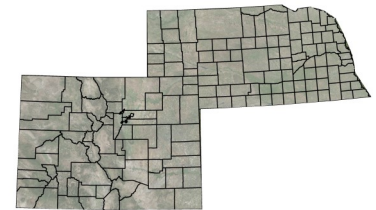
Support for Ecological Consultant

Tammi provides the GIS support for a small business ecological consulting firm located in Boulder, Colorado. She performs the data analysis for the wetland impact studies on various sites within and outside of Colorado. Some of the data analysis as well as the figures she creates are used for Environmental Impact Statements.

MODFLOW Groundwater Model GIS Support

As a GIS Analyst for a water resources consulting company Tammi provided the datasets required for input into two different MODFLOW groundwater models in support of two separate nontributary status water court cases within Division 1 (South Platte River Basin), Colorado. Tammi interpreted over 350 geophysical logs downloaded from the Colorado Oil and Gas Conservation Commission (COGCC) and over 200 lithology logs downloaded from the CDWR. She managed the interpretations in databases that were continuously updated as more data were interpreted. The interpretations, specifically aquifer top and bottom depths and bottom of South Platte alluvium depths, were input into a GIS as point features. The point features were interpolated using geostatistical analysis, specifically the kriging model, to create continuous raster datasets which depicted the conceptual geologic model of the Upper Pierre aquifer. The raster datasets were combined with publicly available data from the South Platte Decision Support System (SPDSS) to determine where the connection between the Upper Pierre aquifer and South Platte alluvium existed. The final raster datasets were exported to ascii files for direct input into the MODFLOW model. Tammi created final maps of the MODFLOW model data input that were included in the expert reports for both water court cases as well as developed maps and geologic cross-sections for follow up expert reports and meetings of the experts. Three-dimensional renderings of the subsurface, particularly adjacent to the South Platte River were created using ArcMap's 3D analyst and shared with the CDWR as well as objectors to the cases for a clearer understanding of the working conceptual geologic model.
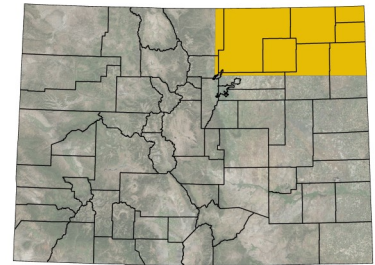
Gunnison River Basin Canal/Ditch Mapping

Tammi provided GIS services for a small business water resource engineering firm by digitizing the canals and ditches within districts in the Gunnison River Basin. The canals and ditches were digitized using recent aerial imagery as well as diversion records and diversion point locations. The canals and ditches will be used for continued modeling in that area.
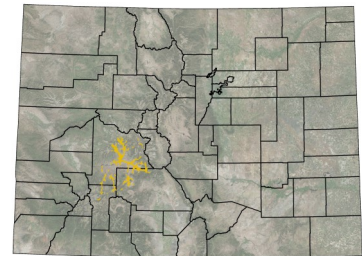
Elbert County Rural Water Supply Study

Tammi has provided support for a rural water supply study in a county in southern Colorado. The data used for the study included publicly available data exported from the Denver Basin groundwater model (Paschke, 2011) so that the team of hydrogeologists could determine aquifer availability in all the Denver Basin aquifers within the county. Within a GIS, some analyses performed included: determining both the unconfined and confined storage of the aquifers, evaluating the number of existing wells and type of wells within each aquifer, comparing observed water levels from USGS monitoring wells with the Denver Basin model predictions, and extracting average aquifer depths and water levels within specific study areas within the county. All data were managed in either flat spreadsheets or geodatabases and updated as needed. Final data outputs were delivered to a hydrogeologist for input into a spreadsheet model for prototypical well analysis. Tammi also provided the final maps and figures for the report that is currently under review at the county level.
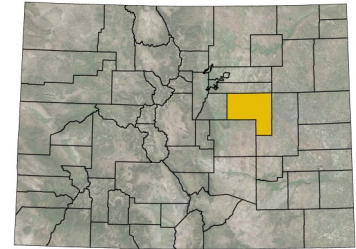
Community Wildfire Protection Plan

As a service to the Coalition of the Upper South Platte (CUSP), Tammi provided GIS analysis for a Community Wildfire Protection Plan (CWPP) written for Woodland Park, Colorado. The goal of the GIS analysis was to weigh areas in greatest need of post wildfire mitigation. Parameters taken into account for the analysis included wildfire risk and fire intensity (data extracted from CO-WRAP); 2– and 10– year peak flows (data extracted from USGS StreamStats); and topography steepness (data extracted from USGS National Map). Tammi processed data through ArcHydro to create sub-basins within the Area of Interest and each sub-basin was given a ranking for each parameter based on the relative maximum, minimum, and mean values. The data analysis was an integral part of the CWPP and will be used in future CWPPs written by the CUSP to enhance wildfire preparedness.
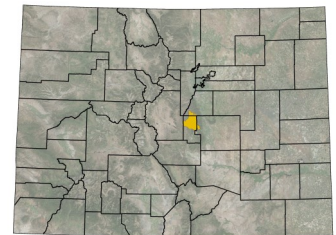
Irrigation Inventory Mapping

Provides support for the irrigation inventory and mapping for Town Center Metro District located within Denver County, Colorado. Tammi manages the geospatial data for the irrigation system within the Metro District and golf course at Green Valley Ranch. As the field crew collects location data for the irrigation system such as flow meters, sprinkler heads, pipes, etc., the data are processed and stored in an ESRI geodatabase. The data are used to update large site maps for in-field references as well as a tool to understand the irrigation system assets.

CO Mined Land Reclamation Decision Support

Tammi supported a small business water engineering consultant in a controversial case brought before the Colorado Mined Land Reclamation Board over the permitting of a gravel pit in El Paso county, Colorado. She gathered and processed publicly available data to display the local geology, water rights, and water wells within the potential impact zone of the proposed gravel pit. Tammi also created a conceptual cross-section of the area to assist hydrogeologists to convince the regulators to think more regionally as far as the impact of mining within a fractured granite formation.
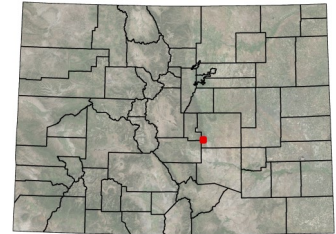
Great Sand Dunes National Park

Performed GIS data analysis for the Great Sand Dunes National Park & Preserve (GSDNP) located on the edge of the San Luis Valley, Colorado. After the GSDNP found themselves with newly collected LiDAR data, a geologist from the National Park Service used that data to define the Park's dunefield footprint and to determine the volume of sand within the Park. Due to the large amount of LiDAR data Tammi performed the analyses alongside the geologist as a QA/QC check. Tammi also integrated the data into ArcScene to animate the growth of the sand dunes and to highlight the location of the megadunes. The analysis was presented to Park interpreters by the on-site geologist.

Colorado Watershed Assembly

Tammi continues to provide mapping services for the Colorado Watershed Assembly, a non-profit "trusted resource where individuals involved with local watershed organizations can go to find information and guidance to help build a constituency". She has provided input for their "Data Literacy" programs as well as contributed large wall maps for their educational outreach including the Purgatoire River Partnership and Poudre River Forum.

ArcMap Toolbox with Python Scripting

Tammi has created python scripts to create efficient workflows of repetitious tasks within ArcMap. One particular project where scripts were essential was for a small business water engineering firm where they required large raster datasets to be converted to dissolved polygons with specific fields populated in the attribute table. The scripts, written in PyScripter, made it possible to perform the conversion in a fraction of the time and repeatedly for multiple states and years worth of raster data.

OPS Gasoline Sites Support

Provides ongoing support for a client's Office of Petroleum Safety (OPS) environmental clean-up sites throughout Colorado. Tammi supports a small business environmental consultant with mapping and data management for several former and present gas station sites where contamination of the groundwater has occurred. GIS support for the sites include: the development of lithologic cross-sections, interpretation of groundwater contour maps, development of groundwater and soil analytical maps, geospatial data collection from publicly available sites, and site location figures.
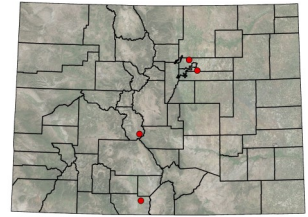
Groundwater Study Support

Provided GIS support for a small business water engineering firm for a groundwater study in Weld County, CO just east of the confluence of Saint Vrain and Boulder Creeks. Tammi extracted data from publicly available sources and displayed the data on maps for a better understanding of the hydrogeology and surface hydrology in the surrounding area. She also extracted data from the groundwater study report tables to include in final report figures. This project contained large amounts of data that were required to be displayed on a limited amount of figures and maps. Cartography was an important key to the display of the data.
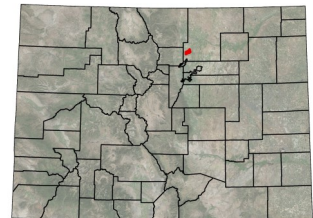
General Services Other Than What is Listed Above:

- Develop thematic maps and figures for clients' proposals to RFPs
- Provide maps, figures, or presentation materials for small reports
- Provided georeferenced images for Phase I reports
- Created hydrogeological cross-sections in support of CDWR Nontributary Determinations
- Provide mentorship to GIS interns/employees at other firms
- Provided GIS reprojection information for CDOT modified projection project
- Used GIS processes to calculate aquifer availability for CDWR pre-213 wells

WORKSHOP PRESENTATIONS:

After the Flames Workshop and Conference, "Hazardous Fuels and Non-Fuels Mitigation Prioritization Using GIS", Denver, Colorado, April, 2019.

Purgatoire Watershed Water Data Workshop, Hosted by the Purgatoire Watershed Partnership, Trinidad State Junior College, Trinidad, Colorado, February 2019.

Sustaining Colorado Watersheds Conference, "Promoting Data Literacy through Data Visualization" pre-conference workshop, Avon, Colorado, October 2018.

CONFERENCE PRESENTATIONS:

Renninger, Tammi, September 2017, "Watershed Component Overlay for Post Wildfire Mitigation" Poster presentation at GIS in the Rockies, Denver, Colorado.

Renninger, Tammi, September 2016, "Growth. Growth? (A Look at Changes in Land Use)" Poster presentation at GIS in the Rockies, Denver, Colorado.

Jehn-Dellaport, Theresa and **Renninger, Tammi**, April 2016, "Investigating the Upper Pierre Aquifer through Regional and Site-Specific Data and Data Integration into a GIS" Presentation at the National Ground Water Association Groundwater Summit, Denver, Colorado.

Yaun, Tammi, October 2013, "The Benefits of Transforming Groundwater and Aquifer Data into Maps and Visualizations Using a GIS Approach: A Look at the Front Range, Colorado" Abstract and Presentation at the Geological Society of America 125th Meeting, Denver, Colorado.

PUBLICATION:

Jehn-Dellaport, Theresa and **Renninger, Tammi**, "The Pawnee Aquifer, Denver Julesburg Basin, Northeastern Colorado", Rocky Mountain Association of Geologists, January 2017.