# Michele Thornton

## Profile and Strengths

*Geographic Information Systems Professional* with expertise and education in biology, ecology, natural sciences and natural resources. Experience coordinating data flow and personnel in the derivation of large datasets from raw inputs to web-based delivery system. Tenured professional *teacher*. Experience and skills include:

*ESRI ArcGIS Suite,*
*Geoprocessing, Model Builder,*
*ArcPy GeoProcessing, Geodatabase*
*Grid /Vector Datasets / Spatial Databases*
*Mutiband and Multi-temporal Datasets*

*Python, Batch, and Shell Scripting*
*GDAL / NCO Utilities*
*NetCDF file format manipulation*
*Web Design, Content, Data Distribution Best Practices*

## Education

***M.S., Biology (emphasis in Stream Ecology)***, Idaho State University, 1997

***B.S., Biological Sciences***, minor chemistry, Michigan State University, 1989
Certification: Secondary Education

## Professional Experience

***Daymet Technical Lead/GIS Professional***, Environmental Sciences Division at Oak Ridge National Lab/DAAC, 9/08 – present. Relocation and continuation of work as ***Associate Scientist II***, Institute for the Study of Society and Environment at NCAR, 2/08 – 8/08

- Coordination and prioritization of data needs and personnel (scientists and staff) of ORNL to accomplish Daymet data runs, data management, data storage, and web-based data distribution (http://www.daymet.ornl.gov)
- Execute surface weather interpolation software and post processing of gridded data products
    - Develop geo-referenced point database of surface weather observations from multiple resources including NRCS, NCDC, GHCN-D, and others covering North America
    - Geospatial datasets including DEM and Land Water Mask
    - Configuration, execution, and management of computational flow through dedicated software interface including QA/QC
    - Management of data inputs and outputs for 30 year daily dataset at 1km gridded spatial resolution covering North America
    - Statistical summarization and mosaicing of interpolated surface weather data
    - Conversion of binary data outputs to CF compliant NetCDF file formats for distribution to public
    - Design and implementation of Daymet website for data distribution
- Data analysis and GIS support of North American Carbon Program (NACP) Modeling and Synthesis Thematic Data Center (MAST-DC).
    - Standardization and summarization of multiple forward and inverse terrestrial carbon cycle models.
- Developed the GIS methodology for the analysis of climate projections from CCSM in a GIS. http://gisclimatechange.ucar.edu/ under "Tutorial".

- Provide technical assistance to NCAR scientists and engineers with GIS data and ArcGIS analytical and mapping functions

***Curriculum Developer,*** AllPoints GIS, Denver, CO, Contract work 2002 -2004

- Updated ESRI-based curriculum from 7.x to 8.x (UNIX to Windows OS based software)
    - Content included GIS basics, Projections, ArcGIS data models, ArcMap, ArcCatalog, Analysis with Spatial Analyst and 3D Analyst, Editing, Cartographic Production, and Geodatabase Layers
- Developed curriculum content and spatial data for raster data concepts and analysis including multi-temporal vegetation analysis and burn severity

***Forestry Coordinator***, EOS Training Center/NTSG, University of Montana, 1998 – 2001

- Responsible for all aspects of MODIS/NASA EOS Land Product multi-day training workshops including personnel coordination, workshop logistics, participant recruitment, curriculum development, data acquisition and processing, and teaching
- Conference presentations highlighting EOS Training Center and MODIS land products and applications. Responsible for yearly reports.
- Designed and provided content for the EOS Training Center Natural Resource Project web site

***Image Analyst/GIS Technician***, Wildlife Spatial Analysis Lab (WSL), University of Montana, 1996 – 1998

- Performed multiple land cover classifications using Landsat TM/ETM+ images running ESRI AML software for multiple uses including the Montana GAP Analysis program. (http://mtnhp.org/ecology/Gap/Intro.pdf)
- Performed unsupervised and supervised classification procedures using TM channels 1-7 and DEM derived variables of slope, aspect, and elevation
    - Compilation of training data including USFS stand exam plot locations
    - Manual delineation of urban, riparian, and agricultural areas
    - Performed accuracy assessments for final land cover classifications
- Derived statewide Stewardship ESRI vector layer for Montana GAP Analysis
    - Acquired polygon layers of stewardship from multiple agencies across Montana
    - Converted, projected, reprojected, standardized attributes, and edge matched vector files into complete Stewardship layer
- Provided FGDC compliant metadata, cartography and individual scene reports (http://geo.gov.ckan.org/harvest/object/1a062545-4bb4-489e-b5f2-1403e5746bf9/html/original)
- Derived USFS Research Natural Areas for the state of Idaho

***Biological Technician,*** Plum Creek Timber Company, L.P., Missoula, MT, 1996

- Field data collection of riparian vegetation structure, stream habitat variables, and fish identification by snorkeling for GIS study of fish abundance and diversity.

***Field and Laboratory Technician***, Stream Ecology Center, Idaho State University, 1993 – 1996

- MS Thesis: Use of Geomorphic Variables to Predict Riparian Vegetation Patterns: A Comparison of GIS and Field Techniques
    - Image processing and classification, supervised classification of riparian vegetation, DEM derivation of elevation, slope, aspect, and valley width, and collection and correction of Global Position System field plot locations
    - Field surveys of riparian vegetation and riparian community type identification
- Field assistant for river ecosystem metabolism studies of Kootenia and Snake Rivers, Idaho
    - Operation of recirculating metabolism chambers and open system instrumentation to monitor aquatic carbon and nutrient fluxes
- Performed stream surveys, monitoring, and assessment
- Data entry and analysis

- Collection and taxonomy of aquatic invertebrates.

***Lead Instructor***, Teton Science School, Kelly, Wyoming, 1992 – 1993
- Classroom instructor and curriculum development for public schools, Elderhostel, Smithsonian, and day long on-site programs throughout the Greater Yellowstone Ecosystem

***Teacher***, Webber Junior High School, Saginaw, Michigan, 1989 – 1992, *Tenure 1991*
- Taught ninth grade physical science and seventh grade earth and general science

## AUTHORED EVENTS

Data Set:

Thornton, P.E., M.M. Thornton, B.W. Mayer, N. Wilhelmi, Y. Wei, R. Devarakonda, and R.B. Cook. 2014. Daymet: Daily Surface Weather Data on a 1-km Grid for North America, Version 2. Data set. Available on-line [http://daac.ornl.gov] from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, USA. Date accessed: YYYY/MM/DD. Temporal range: YYYY/MM/DD-YYYY/MM/DD. Spatial range: N=DD.DD, S=DD.DD, E=DDD.DD, W=DDD.DD. http://dx.doi.org/10.3334/ORNLDAAC/1219

Publications, Talks, and Posters:

Liu, S., Wei, Y., Post, W. M., Cook, R. B., Schaefer, K., and Thornton, M. M.: The Unified North American Soil Map and its implication on the soil organic carbon stock in North America, Biogeosciences, 10, 2915-2930, doi:10.5194/bg-10-2915-2013, 2013.

"Daymet Gridded subdaily weather data for North America". Author - poster presented at NASA Carbon Cycle and Ecosystems Joint Workshop, Alexandria, VA. 2011. http://cce.nasa.gov/meeting_2011/abs_and_discussions/mtg2011_ab_searchab_id173.html

"Modeling and Synthesis Thematic Data Center (MAST-DC) Support for North American Carbon Program Interim Syntheses" Co-author - poster presented at NACP All- Investigators Meeting, San Diego, CA. 2009.

"Preliminary Results of the NACP Regional Interim Synthesis" Co-author - talk presented at American Geophysical Union conference, San Francisco, 2009.

Redmond, R. L., et al. "The Montana gap analysis project: final report." *Montana Cooperative Wildlife Research Unit, University of Montana, Missoula, Montana. xiii* (1998).

Educational Materials:

"Accessing Daymet Data Through Web-Based Tools and Services". Presenter, NASA Earthdata Webinar.

Developed methods for Exploring Climate Data using GIS now in use at the Earth Exploration Toolbook: http://serc.carleton.edu/eet/ncardatagis/teaching_notes.html Highlighted by ESRI: http://www.esri.com/news/arcnews/winter0405articles/ncar.html . And also available at: http://gisclimatechange.ucar.edu/ under "Tutorial".