Data Management Plan

Data collected during this project will conform to principles outlined in NSF policies on Responsible Conduct of Research (http://www.nsf.gov/bfa/dias/policy/rcr.jsp) and the Open Government Directive (http://www.nsf.gov/open/). Data will be acquired, managed and stored in conformance with standards that represent best practices for research.

I. Types of Data

Research data generated under support from this project may include any of the following:

(i) Geospatial, socioeconomic and life cycle analysis pertaining to pine and switchgrass based energy information from journal papers, conference proceedings, reports, and other publicly available sources.

(ii) Geospatial analysis encompassing Parameter-elevation Regressions on Independent Slopes Model (PRISM) Climate Group (http://www.prism.oregonstate.edu/) based temperature and precipitation data; topographic conditions (slope and elevation), and solar condition (the aspect of a specific location) derived from a national elevation dataset (NED), available from http://ned.usgs.gov/; Soil conditions, including information such as percentage of clay, sand, silt, pH value and bulk density, gathered from SSURGO database; community and transportation routes layers (US Census' Bureau), and water bodies layer (available from http://nationalmap.gov/landcover.html), Land use types, flood plains data from USGS's The National Map site's National Land Cover Database (NLCD); and other openly available remote sensing and GIS data.

(iii) Data generated from the life cycle analyses, geospatial fuzzy logic based model under a variety of scenarios, socioeconomic acceptance, greenhouse gas emissions, etc. As the research progresses, such data will be changed due to the improvement of models and bioenergy supply chain details sourced from collaborators at the University of Missouri and Virginia Tech.

(iv) Information of farmers and landowners using the USDA's National Agricultural Statistics Service (NASS) database and databases/contact lists made available by collaborators at the University of Missouri and Virginia Tech or sourced by companies like List Giant.

(v) Data from human participants (e.g., from interviews about perception and acceptability of feedstock harvesting treatments by landowners, managers, contractors, and harvesters, landowner acceptability mail survey, reservation price surveys conducted by survey agency like Qualtrics).

(vi) Simulation codes implementing algorithms for data management and analysis that could be used by other researchers (e.g., Matlab scripts, STATA programs for statistical analysis).

(vii) Educational materials to be used in courses and mentoring.

(viii) Visualization and outreach products developed by the PIs and student trainees for research as well for education (including for school students).

II. Data Standards

Research data generated under this project may vary widely in format (e.g., geospatial data, life cycle analysis, techno-economic data, survey data, farm and forest level economic data obtained from partner land-grant universities). Electronic data will be organized in folders with appropriate identifying file names with readme files describing the generation/collection of the data set.

III. Policies for Access and Sharing and Provisions for Appropriate Protection/Privacy

Results will be published in peer-reviewed journal articles and presented at local and/or international scientific conferences. Published data will be available in print or electronically from publishers, subject to subscription or printing charges. The survey and interview based research involves human participants, the investigators will request expedited Institutional Review Board (IRB) review compliant with procedures established by the Montclair State University IRB. Research activities envisioned in the project present no more than minimal risk to human subjects. During data analysis, the data will be accessible only by certified members of project research team dealing with human participants. We will remove any direct identifiers in the data before storing it.

All data, materials, and products generated from this project will be stored in Montclair State University's Institutional Repository run on Digital Commons which is hosted and supported by bepress, and managed MSU's Sprague Library. Digital Commons assists institutions in collecting, preserving, archiving, and making accessible, scholarly and creative works, research data, and other materials produced by the institution's researchers, faculty, staff and students. Once per project year, faculty will submit project-based data, materials, and products to the MSU Institutional Repository for storage in Digital Commons. Digital Commons is the leading hosted institutional repository software for universities, colleges, law schools, and research centers. Digital Commons is a suite of tools and services that enables institutions to manage, display, and publish scholarship to the web in a highly visible showcase. Scholarly material and special collections in Digital Commons repositories are highly discoverable in Google, Google Scholar, and other search engines. Additionally, articles in Digital Commons repositories are indexed in the Digital Commons Network, a free discovery tool for full text scholarly articles used by researchers worldwide. This institutional based data archiving system will facilitate long-term accessibility for future users, beyond the project duration.

The existence and availability of the data sets will be communicated to the NSF in progress reports and to research peers at conferences, and they will be referenced in publications.

IV. Policies and Provisions for Re-Use, Re-Distribution

All materials and products generated from this project will be stored on Montclair State University's existing content management program, Digital Commons, hosted and supported by bepress and managed by Karen Ramsden, Research and Projects Specialist at MSU's Sprague Library. Digital Commons is the leading hosted institutional repository software for universities, colleges, law schools, and research centers. Digital Commons is a suite of tools and services that enables institutions to manage, display, and publish scholarship to the web in a highly visible showcase. Scholarly material and

special collections in Digital Commons repositories are highly discoverable in Google, Google Scholar, and other search engines. Additionally, articles in Digital Commons repositories are indexed in the Digital Commons Network, a free discovery tool for full text scholarly articles used by researchers worldwide. The content is owned by the institution, while bepress provides the platform and support.

V. Data Retention

The PI will ensure that the types of data described above are stored in data (e.g., comma separated values (CSV) files) and metadata formats (e.g., geospatial data layers) that conform to industry standards and accepted best practices. Once per project year, the PI will submit project-based data, materials, and products for storage in the Digital Commons repository. Backup copies can be made on external media and stored in one of the PI office and/or on University servers.