Life Cycle Assessment of Food Systems Sustainability at the City-Scale

1. RDM Documentation Table

This table is to be filled out as completely as possible before the beginning of the project, and updated as needed, including at the end of the of the project, and after, as derivative publications are created.

Section 1: Research Data Management Documentation Table

Name of Principle Investigator(s) or Contractor(s) and ORCiD number	Tiffanie F. Stone	
Current Project Title, and all previous project titles	Life Cycle Assessment of Food System Sustainability at the City-Scale	
Iowa DOT Project Manager		
Iowa DOT Project number		
Other contract or grant numbers		
Iowa DOT Research-assigned project Digital Object Identifier (DOI), or researcher acquired DOI		
TRB Research in Progress (RiP) Title, Accession Number, and URL		
Project Duration (projected)	**Start Date: 1/1/2020**	**End date: 6/15/2021**
Do the data management requirements of the US DOT "Plan to Increase Public Access to the Results of Federally-Funded Scientific Research" apply to this project	**Yes or No; and if No, why not:**	
Name(s) of Federal funder(s), Funding Program Name(s), Agency Code(s) and/or Contract/Grant numbers		
DMP Version		
Date DMP amended, if any		
Name and ORCiD number of each author		
Persistent links or identifiers assigned to this project, datasets, reports, or peer reviewed publications generated by this project		

Name and URL of all peer reviewed publications which have been generated from this project

2. Description of the Data

- What type of data will be produced? (Tabular, sensor, video, audio, etc.)
- In what formats? (.txt, .cvs, .tiff, etc.)
- Are there special tools or software needed to create/process/visualize the data?

Secondary data will be compiled to describe the food system in Des Moines, IA using a Life Cycle Analysis (LCA). National data sets will be used as a baseline where state and county data sets are not available. Public data sets covering food consumption, food imports and exports and food miles will be used to establish a baseline for the models. Data

Models incorperated into the LCA will include a climate model (NARCCAP), crop model (EPIC), two water models(SWMM & SWAT). EIO-LCA software will be employed to input data and model the food system.

Cy-box will be used as the research data management system. It utilizes cloud-based tools, while syncing and storing on a local database, Iowa State University networked desktop as well.

- How will data be collected?
- How will the data collection be documented?
- What project and data identifiers will be assigned?
- Will you use pre-existing data? If so, from where?

Data will be collected from government sources and from data available from the scientific community. It will be compiled in excel and analyzed in R. Documentation will be under the project name LCA Food System is the proejct identifier and data will be clearly labeled with a description and units to enhance understanding.

Data will be exported as saved into CSV files when it is shared. A data dictionary will be provided, it will include: variable name, value range, units, methodology, and description.

- How much data will there be, and at what growth rate? (1 GB, 3 TB etc.) How often will it change?
- How will you store, backup, and protect data from lost during the research project?
- Who is responsible for managing the data?

Data will be backed up and stored in CyBox, a cloud-based drop box. Additionally, a local copy will be stored on an Iowa State desktop. R scripts will be stored in the cloud via Git Hub.

Initially, data management will be the responsibility of Tiffanie F. Stone, subject to change as project progresses.

- Will the data collected be unique or will the data be reproducible? What would happen if the data got lost or became unusable later?
- Who will potentially use the data?
- What value does the data have over the long- term? (Please consider not only your research team, but third parties as well.)

The data collected should be reproducible because the majority of it is secondary data pulled together to create a unique outcome. If the data is lost, it can be found online, cleaned, and recompiled by pulling R scripts from Git Hub.

The data could be used by other scientists to better understand food systems at a city-scale. This is important to understanding the environmental impacts and looking at what would need to happen to create a more sustainable future.

3: Standards to be Used

- Are your data formats open or proprietary? If proprietary, what is the rationale for using that format?

Our data formats will be open, using standard file formats in order to ensure maximum utility for ourselves and others who may benefit from this research.

- What standards will be used for documentation and metadata?
- What documentation or descriptive metadata will you be creating in order to contextualize the data for future users?

Data will be compiled and checked for errors. Documentation includes a data dictionary which will provide important contexualization by explaining the objectives and all the shorthand terms used in the data sets.

4. Data Organization and Description

- How will the data be organized?
- What directory and file naming conventions will be used?

Data will be organized by theme and grouped in folders according to topics. Food systems are complex, it will be important to use and clearly define naming conventions to avoid confusion.

- What metadata schemas are appropriate for describing these types of data?
- What metadata schema will be chosen for this data?

This data was created to better understand city-scale food systems in the US using Des Moines as a case study. The data sets were created by compiling data from county, state, national sources and the scientific community where possible covering a wide number of topics that are important to city-scale food systems.

This data will be compiled by Tiffanie F. Stone, Janette Thompson and Kurt Rosentrater. Tiffanie F. Stone should be contacte for more information about the data and a copy of the full data set will be publicly available after publication.

5. Policies for Access

- Does the data contain any personally identifiable information (PII)?
- If so, how will you anonymize or deidentify the data if PII is present?

Data collected does not contain any personally identifiable information.

- Are there any special privacy or security requirements (e.g., personal data, high-security data)?
- What steps will be taken to protect privacy, security, confidentiality, intellectual property or other rights?
- Does your data have any access concerns? Describe the process someone would take to access your data.

No personal or high-security data will be used for this project.

Who controls the data (e.g., funder, PI, student, lab, University)?

Are there any embargo periods to uphold?

The data will be controled by the research funder and the research team.

6. Policies for Re-Use, Re-Distribution, and Derivative Products

Who might be the audience for data reuse? Who will use the data now? Later?

Any sharing requirements (e.g., funder data sharing policy)?

Data may be reused to set up other city-scale food system analyses, especially in the US. Presently, the data will be used by the research team to conduct a food system analysis of Des Moines, Iowa but later it may be used as a template to apply to other cities.

When will the data be published and where?

If you allow others to reuse your data, how will the data be discovered and shared?

Data will be published by 2022 and possibly sooner. Data will be available on the NSF website after all the overall team study is published.

What license type is being used (e.g.: Creative Commons 0, etc.)

What special tools and/or software are needed to work with data?

No license types have been identified. Modelling software will be needed to work with the data. Climate model (NARCCAP), crop model (EPIC), two water models (SWMM & SWAT) and EIO-LCA software will all be employed to work with the data.

After the project begins officially, this data management plan will be modified to reflect the most up-to-date information available and will address all funding agency requirements and those of the research team as a whole.

7: Plans for Archiving and Preservation

Are there data archives that my data is appropriate for (subject-based? Or institutional)?

Which archive will the data be stored in and why was it chosen?

What is the persistent identifier type used by the archive?

How will the data be archived for preservation and long-term access?

How long should it be retained (e.g., 3-5 years, 10-20 years, permanently)?

What file formats will the data be preserved in? Are they long-lived? Are they proprietary?

Who will maintain my data for the long-term?