Purdue University Agriculture & Biological Engineering Summer Internship

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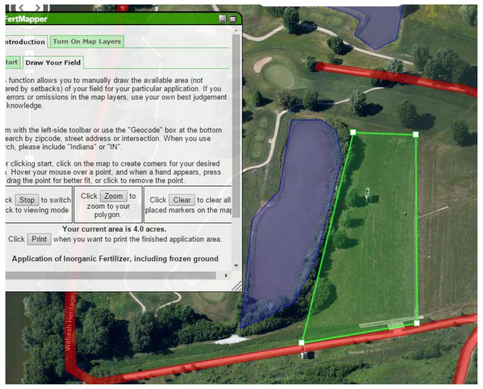
Special thanks to: Dr. B. Engel, Head and Professor, Agricultural and Biological Engineering; Youn Shik Park, Purdue University Research Assistant

OSIC Manure Project

- The objective of this project is to display a map view, along with obstacles on land, to the user and allow him to draw and estimate his land for use based on the obstacles.
- The existing model uses PostgreSQL technology with a PostGIS database to store map layers.
- Using the OpenLayers API and Google Maps API, the model displays a map view to the user.
- Users then enter their input by drawing polygons around obstacles on the map to represent their land.

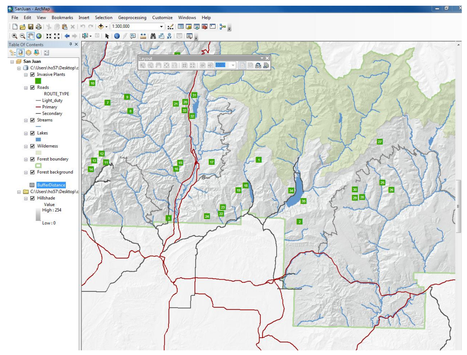


The green polygon drawn represents the user's land.

Obstacles like roads and water are visible on map so that the user can adapt and plan their land use.

ESRI Training Course

- Enrolled in and completed ESRI online training course:
- . Basics of Python (for ArcGIS 10)
  - Introduces the Python scripting language.
  - Worked with many GIS-related examples.
  - Introduces ArcPy, which integrates Python into ArcGIS10
- Python Scripting for Geoprocessing Workflows
  - Introduces Python scripting within ArcGIS Desktop to automate geoprocessing workflows



STEPL Project – Problem Statement

- The task is to implement improvements on the STEPL model's interface and features.
- The existing STEPL website, written by Youn Shik Park, is functional and open to the public. We are to improve and test implementations on a clone of the website before applying the changes.
- Several specifications for improvements were given at the beginning of the task, while discussions about future improvements and ideas were encouraged.
- Documentation of these changes are prioritized in an effort for long term maintenance.

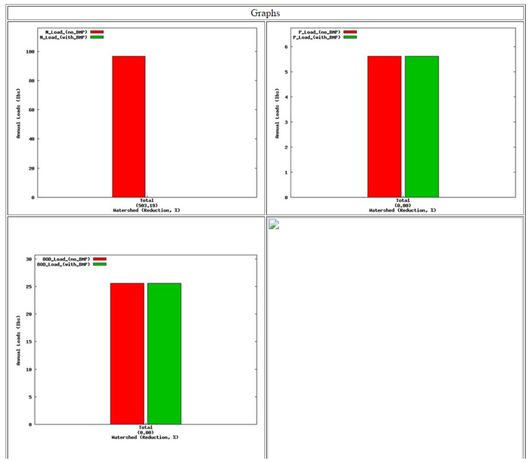
STEPL Project – Background

- The STEPL model is designed to analyze how creation or practicing certain sustainable activities will reduce pollution in a watershed.
- This model uses soil properties database, precipitation database, other factors and user-entered practices like filter strip to make estimates of pollution, and estimates of how much reduction of pollution in watershed from an action. Then estimates the cost of the action – so we are applying cost to the cleanup of pollution.
- The user inputs data and specifics on the number of watersheds and landuses in the main input page.
- The data is calculated based on the specifics and the end graphs are generated:

Annual Loads Summary Click to Download

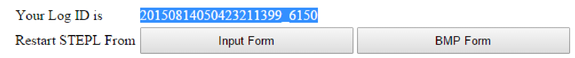
Watershed	N Load (no BMP) lbs/year	N Load (with BMP) lbs/year	N Reduction %	P Load (no BMP) lbs/year	P Load (with BMP) lbs/year	P Reduction %	BOD Load (no BMP) lbs/year	BOD (with BMP) lbs/year	BOD Reduction %	S Load (no BMP) tons/year	S Load (with BMP) tons/year	S Reduction %
1	97	-389	503	6	6	0	26	26	0	0	0	0
Total	97	-389	503	6	6	0	26	26	0	0	0	0

Graphs

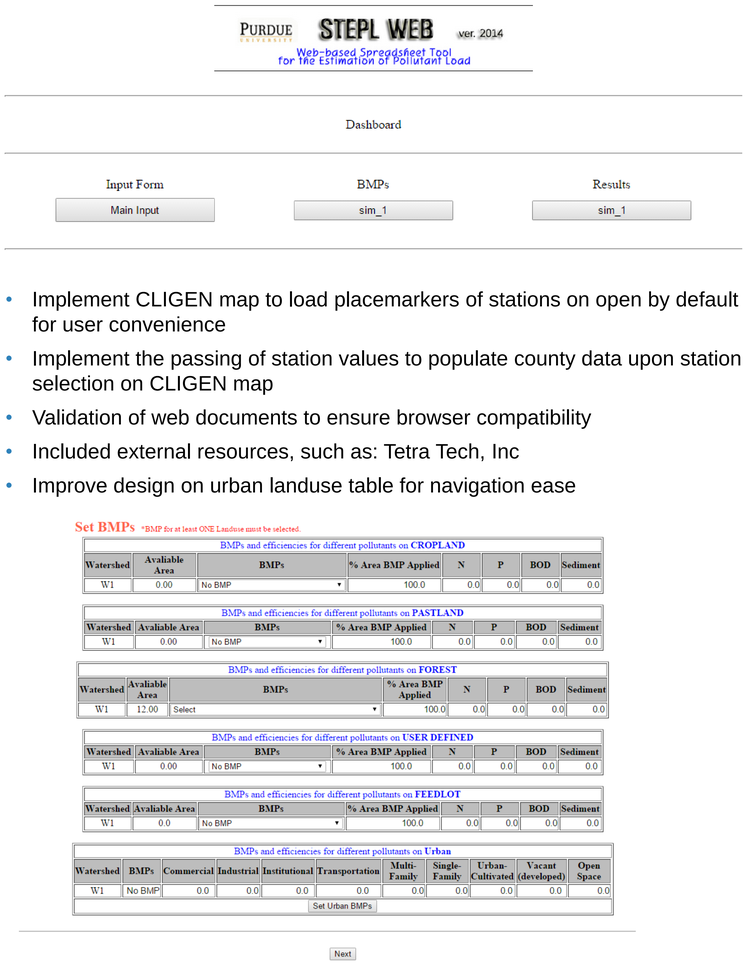


STEPL Implementations

- Implemented a reload system for users to reload their previous sessions using temporary save files stored at the end of every run.



- Users are given a log ID that can be entered at the start of STEPL to bring them to a dashboard containing their previous session



- Implement CLIGEN map to load placemarkers of stations on open by default for user convenience
- Implement the passing of station values to populate county data upon station selection on CLIGEN map
- Validation of web documents to ensure browser compatibility
- Included external resources, such as: Tetra Tech, Inc
- Improve design on urban landuse table for navigation ease

- Updated information on references
- Linked L-THIA model to STEPL while retaining input data
- Vast UI improvements on all pages to improve usability, such as:
  - Explanatory documentation
  - Input field checking to avoid calculation errors