

Team 6

Cognitive Walkthrough

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Overview

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WEPA - Water Erosion Prediction Application

The Water Erosion Prediction Project (WEPP) is a physically-based hydrology and soil erosion model developed to predict soil detachment and movement.

<http://geodjango.mtri.org/geowepp/>

<https://forest.moscowfs1.wsu.edu/cgi-bin/fswepp/wd/weppdist.pl>

Users and Environment

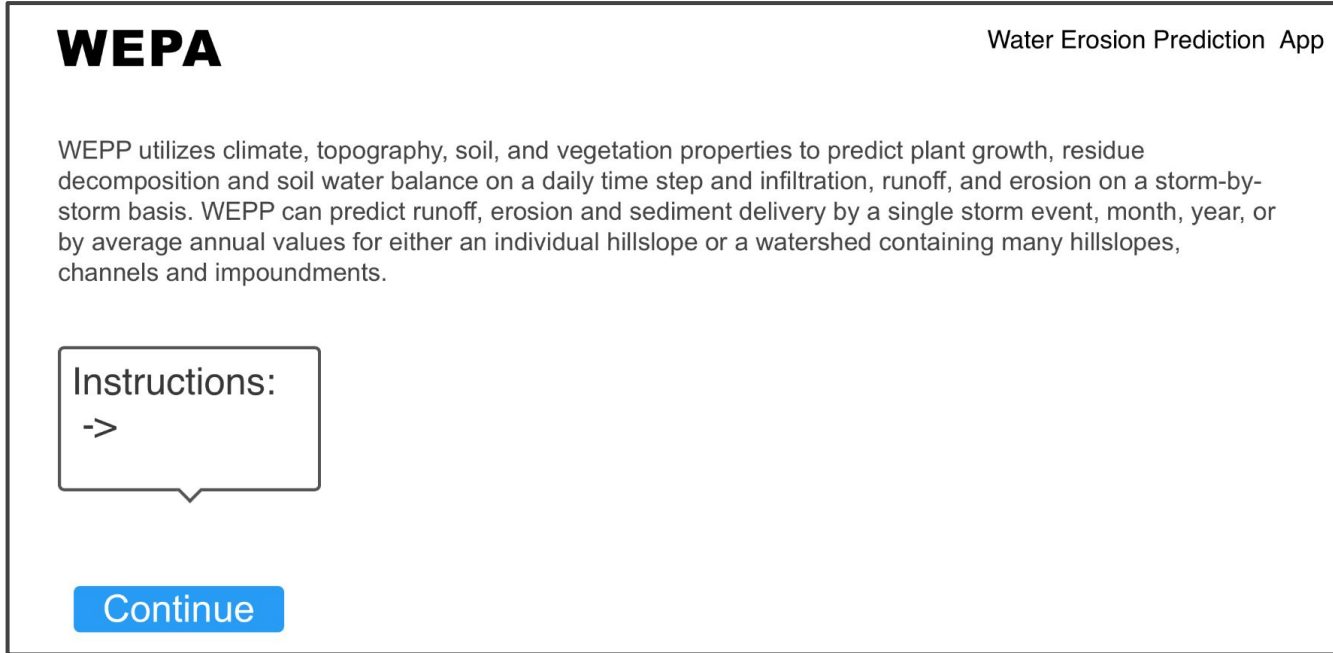
Users

- Primarily those interested in the erosion of hillslope soil
- Also, Forest Services

Environment

Any solid piece of land

Home Page



- The home page will contain the information about the app itself
- It will also display instructions on how to use the app

Inputs generator View

Spatial WEPP Model Input Generator

Select State

Select Year

[Request Inputs](#)

[Query Inputs](#)

Request inputs provides an archive file containing files used to generate the WEPP model

Lets the user generate various WEPP model based on the generated inputs

WEPP (Water Erosion Prediction Project) Model Generator

Run description: Years to simulate:

Climate	Element	Treatment / Vegetation	Gradient (%)	Horizontal Length (ft)	Cover (%)	Rock (%)
BIRMINGHAM WB AP AL CHARLESTON KAN AP WV DENVER WB AP CO FLAGSTAFF WB AP AZ MOSCOW U OF I ID MOUNT SHASTA CA SEXTON SUMMIT WB OR Custom Climate closest	Upper	Mature forest Thin or young forest Shrubs Good grass Poor grass Low severity fire High severity fire Skid trail	<input type="text" value="0"/> <input type="text" value="30"/>	<input type="text" value="50"/>	<input type="text" value="100"/>	<input type="text" value="20"/>
	Lower	Mature forest Thin or young forest Shrubs Good grass Poor grass Low severity fire High severity fire Skid trail	<input type="text" value="30"/> <input type="text" value="5"/>	<input type="text" value="50"/>	<input type="text" value="100"/>	<input type="text" value="20"/>
Soil Texture clay loam silt loam sandy loam loam						

Run WEPP

Disturbed WEPP allows users easily to describe numerous disturbed forest and rangeland erosion conditions. The interface presents the probability of a given level of erosion occurring the year following a disturbance

Generated Disturbed WEPP Model Results

Disturbed WEPP Results

User inputs

Location	BIRMINGHAM WB AP AL				
Soil texture	clay loam				
Element	Treatment	Gradient (%)	Length (ft)	Cover (%)	Rock (%)
Upper	mature forest	0	50	100	20
		30			
Lower	mature forest	30	50	100	20
		5			
Description					

Return period analysis based on 10 years of climate

Return Period	Precipitation (in.)	Runoff (in.)	Erosion (t ac ⁻¹)	Sediment (t ac ⁻¹)
10 year	58.52	6.06	0.06	0.0639
5 year	56.23	5.08	0.04	0.0356
2 year	54.71	3.52	0.02	0.0172
1 year	47.34	0.76	0.00	0.0015
Average	53.70	3.30	0.02	0.0178

Mean annual averages for 10 years

	Total in 10 years
53.70 in. precipitation from	1125 storms
2.74 in. runoff from rainfall from	49 events
0.56 in. runoff from snowmelt or winter rainstorm from	26 events
0.018 t ac ⁻¹ upland erosion rate (0.004 kg m ⁻²)	
0.018 t ac ⁻¹ sediment leaving profile (0.129 kg m ⁻¹ width)	

Probabilities of occurrence first year following disturbance based on 10 years of climate

Probability there is runoff	100 %	<div style="width: 100%; height: 10px; background-color: red;"></div>
Probability there is erosion	90 %	<div style="width: 90%; height: 10px; background-color: red; border: 1px solid green;"></div>
Probability there is sediment delivery	100 %	<div style="width: 100%; height: 10px; background-color: red;"></div>

User Scenario - Lois Pearson

- Professor of biological sciences.
- Check soil on a hillside near campus.
 - Recently suffered a wildfire.
- No clear understanding of the outputs generated by the Disturbed WEPP.
- Alerts a local soil erosion team.
- Professionals are then capable of using the data to study the area.

User Scenario - Aaron Hale

- Environmental Engineer.
- Concerned with the effects of a recent burn in his yard.
- Submits information to the MTU Disturbed WEPP Model database.
- Information is reviewed by a Scientist and the change is made.

User Scenario - Ben Gemmin

- Average Citizen Scientist.
- Extended rainfall has caused the hill near his house to possibly become unstable.
- His friend Aaron exclaims that he should consider looking into the soil integrity.
- Ben looks up his address using the WEPA to get information on the soil integrity.
- The information he receives concerns him so he takes the info to a professional.
- After a survey, it is concluded that the information he received was inaccurate.
 - The Geolocation conversion of his address turned out to be off from the actual latitude and longitude and instead mapped to a nearby ditch.
- Rewinding time...
- The application alerts Ben that using just his/her address may not map to the proper GPS Coordinates, instead Ben looks for his location on a map and indicates it manually.

Usability Goals

→ Effective

- The user receives the data promptly

→ Utility

- People use the application

→ Accessibility

- Citizen scientists
- The application itself is easy to use
- The application abstracts the more complex aspects of the query process.

→ Informative

Usability Concerns

- Data input
 - Spatial WEPP Model Inputs Generator
- Output format
 - Three different tables of information
- Redundant information
- Mobile view