Using Geospatial Data in Conservation Planning

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Geospatial data – data that is explicitly geographically referenced

Used with Geographic Information Systems to answer:

- **What** – what characteristics are present for an area of interest (AOI), including people associated with AOI
- **Where** – where are the areas with a given set of characteristics, including people associated with AOI
- **When** – When did characteristic(s) change
- **Why** – The most interesting and difficult

Managing and analyzing this information requires data
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https://gdg.sc.egov.usda.gov/
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General land cover characteristics by NACD

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Characteristics of Northeast NACD

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<th>State</th>
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<th>pop_sqmi</th>
<th>pct_dev</th>
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Geospatial data helps refine existing general soils information, WV
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Geospatial data helps refine existing general soils information.
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Geospatial data helps with initial soil mapping.

Soil Scientists’ Knowledge

Soil Inference Engine

Environmental Data

Inferred Cabot soil distribution
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Geospatial data helps with initial soil mapping

Raster soil mapping of a lodgment till catena in the upper Wild Ammonoosuc River watershed, NH
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Bathymetric sampling for sediment survey and subaqueous soil mapping,²

Lake Galena, IL Bathymetric map

Subaqueous soil map, Rhode Island⁷
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Identification of critical areas in Vermont

LiDAR is essential

Lake Champlain Basin

10m DEM

1m DEM from LiDAR

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Flow accumulation on crop fields in Vermont – assist in outreach where riparian buffers may be needed
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Identification of critical areas in Vermont

Can we find deep or ephemeral gullies?

Possible gullies encroaching on crop fields
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**Prioritizing and tracking work - Vermont**

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<td></td>
<td>Reed</td>
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<td>Caroline (#1 priority for CA) and Gus</td>
<td>Caroline(#2 priority for CA)</td>
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<td><strong>Rock River</strong></td>
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<td>85% complete - still working on methodology</td>
<td>100% complete</td>
<td>contacted UVM student about methodology - on hold low priority</td>
<td>Caroline Reed</td>
<td>Caroline Reed</td>
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<td>high</td>
<td>Caroline Reed</td>
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<td>began 5/14; 100% complete; QA complete 5/20</td>
<td>85% complete - still working on methodology</td>
<td>100% complete</td>
<td>contacted UVM student about methodology - on hold low priority</td>
<td>Caroline Reed</td>
<td>Caroline Reed</td>
<td>high</td>
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</tbody>
</table>

*Image: Edge of field water quality monitoring in Vermont*
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Highly Erodible Land Determinations in New Jersey - prototype

Field with soils

Slope from LiDAR

HEL result
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AgBufferBuilder ¹ - A GIS based tool for **design** and assessment of filter strips

47% trapping efficiency

72% trapping efficiency
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AgBufferBuilder - A GIS based tool for design and **assessment** of filter strips

The total area devoted to filter strips is the same for uniform and variable widths. Effect on trapping efficiency is dramatic.

- **72% trapping efficiency for areas in red**
- **35% trapping efficiency for typically designed uniform width filter strip**
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Tools to automate tasks needed for planning

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NRCS Engineering Tools
- Field Office Tools
  - Clip DEM to AOI
  - Create Contours From AOI
  - Create Cross Section / Profile(s)
  - Estimate Pool From Contours
  - Slope - Average by AOI
  - Slope - Percent By AOI

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POINT_Z

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Tools to automate tasks needed for planning

51.1 ac. dr. area
6.3 % avg. slope
74 overall CN

EFH-2 Estimating Runoff and Peak Discharge

Introduction

Basic data

Client: James Buffett
State: KY

Practices: Gravved Waterway

By: SDC
Date: 1/3/2013

Drainage Area: 51.1 acres
Runoff Curve Number: 74
Watershed Length: 3317 feet
Watershed Slope: 6.3 percent
Time of Concentration: 0.66 hours

51.1 ac. dr. area
6.3 % avg. slope
74 overall CN

86 cfs Peak Flow - 1m LiDAR
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Tools to automate tasks needed for planning

“Wheeled Distance” vs. “As the Crow Flies”
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References


3. http://www.mngeo.state.mn.us/cgi-bin/LiDAR/topic_show.pl?tid=24


