Muddy Creek Ferron Sandstone lidar dataset
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Short description:
Data represents approximately 8km of cliff exposure of Ferron Sandstone along both sides of Muddy Creek canyon, southeast of Emery, UT. The Muddy Creek (MC) area of interest (AOI) is southeast of the town of Emery, UT and extends from approximately where Muddy Creek intersects Miller Canyon in the south to the Rochester Panel in the north.

Last update: 10/14/2014

File description:

<table>
<thead>
<tr>
<th>Name*</th>
<th>Location**</th>
<th>Point Clouds</th>
<th>TINs</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCW1</td>
<td>West wall lower canyon; South end of muddy creek canyon at miller creek canyon junction</td>
<td>MCW1_pointcloud.txt</td>
<td>MCW1_mesh1.ply</td>
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<tr>
<td>MCW2</td>
<td>west wall lower canyon; overlaps MCW1 on southern edge, MCW3 on northern edge</td>
<td>MCW2_pointcloud.txt</td>
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</tr>
<tr>
<td>MCW3</td>
<td>west wall lower canyon</td>
<td>MCW3_pointcloud.txt</td>
<td>MCW3_mesh1.ply</td>
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<tr>
<td>MCW4</td>
<td>west wall lower canyon</td>
<td>MCW4_pointcloud.txt</td>
<td>MCW4_mesh1.ply</td>
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<tr>
<td>MCW5</td>
<td>west wall lower canyon</td>
<td>MCW5_pointcloud.txt</td>
<td>MCW5_mesh1.ply</td>
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<tr>
<td>MCW6</td>
<td>west wall lower canyon</td>
<td>MCW6_pointcloud.txt</td>
<td>MCW6_mesh1.ply</td>
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</table>
*Naming convention is AOI, cliff exposure, subsection counted from the south, so MCW1 indicates the Muddy Creek Area of Interest, the west wall of the canyon, and the southernmost subsection.

**See map on page 5 for definition of regions.

**Creator:**

Original lidar scans were acquired by Sheila M. Trampush (PSU), with assistance from Ellen Chamberlin (PSU) and Evan Greensberg (McAlister University). All processing of the pointcloud and creation of the TINs was done by Sheila M. Trampush.

**Dates:**

Scans were collected June 2014. Processing of lidar data (point clouds and TINs) was done September 2014-October 2014.

**Location:**

The MC AOI is southeast of the town of Emery, UT on the west side of the San Rafael Swell, and it is bound on the south by the intersection of Muddy Creek with Miller Canyon Road (a.k.a the Emery Cutoff Rd.) and on the north by the Rochester Panel (a BLM managed pictograph site). The AOI is divided into five regions: lower canyon, lower gooseneck, middle canyon, upper gooseneck, and upper canyon (see map on page 5 for approximate locations of subregions).

**Purpose of dataset:**

This dataset was collected as part of Sheila M. Trampush’s PhD dissertation work to quantify stratigraphic organization in different marine depositional environments. The lidar was collected to gather bed geometry data for beds over 10cm thick over a wide area of exposure.

**General Geologic description:**

*Formation:* Ferron Sandstone member of the Mancos Shale, includes parasequence sets 2-7

*Age:* Turonian-Coniacian (Upper Cretaceous)

*Depositional environment:* Deltaic; submarine to subaerial. Generally more proximal deposits are to the north and up section.

*Noteworthy features:* Mouth bars, distributary channels, growth faults, coal

**References:**

Described in detail in:

Processing history:

Lidar scans were collected with a Riegl VZ-1000 and were post processed using RiScan Pro 1.7.8. Regions were selected in RiScan, converted to polyobjects and exported as ascii text files (format XYZRGB, comma delimited, 1 line header row). Text files were imported into MeshLab 64bit 1.3.3, normals were calculated using “calculate normal for point sets” and a mesh was created using “Surface Reconstruction: Poisson” using octree depth 11, and solver divide 8. Excess faces were removed manually.

Maps and examples:

Depositional features of interest:

Mouth bars, shallow clinoforms dipping to right near star (from MCW1 using ‘Lambertian Radiance Scaling’ shader to highlight beds).
Classic shallowing up shoreface/mouth bar succession (from MCW1, ‘Lambertian Radiance Scaling’ shader to highlight beds)

**Structural features:**

Pervasive joint sets throughout sandstone (from MCW1-3, using ‘lit sphere radiance scaling’ shader to highlight joints)
Index of regions:

- Muddy Creek Canyon
- Lower Canyon
- Lower Gooseneck
- Middle Canyon
- Upper Gooseneck
- Upper Canyon

Muddy Creek Canyon Ferron Sandstone
Lower Canyon mesh (MCW1-6)
MCW3

MCW4