Ripple Mark Mapping
Camas Prairie Project

Project Members
Edward Kleinsasser
Fred Bunt
Katie Roskilly
Sean Lodmell
Ripple marks suggest MASSIVE fluid flows

Mega floods 15,000 years ago.

http://hugefloods.com/LakeMissoula.html
Objectives

- Test low cost data acquisition technologies.
- Better resolution of models.
- Create base layers for GIS surface models
Data Acquisition Systems

Camera system

- Tethered balloon
- Handheld GPS unit-Trimble GeoXH

Ground Truth

- Traverse the landscape with handheld GPS record points
Structures from Motion Photosynth

Images need lots of overlap.

Distinct features

Photosynth Image to 3-D Pointcloud
Photosynth - Outputs points with arbitrary coordinates.

Scanview - Trim stray points. Locate GCPs.

JAG3-D - Transform points to real world coordinate system.

Arcmap - Create DEM.

Export to textfile - Format data set.

Excel - Reformat points into X,Y,Z format.

Excel - Final format for import into Arcmap.g
Post Processing GPS Data

- More satellites better accuracy
- Field-rover can communicate with several base stations

http://www2.ocgi.okstate.edu/gpstools/overview1.htm#Post_Processing
Creating the DEM in Arcmap

- Specify coordinate system
Triangular Irregular Network (TIN)

- Mass points:
  - Camera method 300,000 points
  - Ground truth method 25,000 points
- Interpolates between points using “nearest neighbors”
TIN to Raster

- Raster – rectangular grid of cells.
- Cell size denotes resolution.
- Resolution
  - Ground truth 1 m x 1m
  - Camera method 5cm x 5cm
**Comparison of Methods**

**Tethered Balloon Method**
- Requires extensive data processing
- Excellent as low cost high resolution method for smaller projects

**Ground Truth**
- Simplicity
- Overall project cost
- Excellent for low cost projects where meter resolution is adequate.